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National University of Ireland, Cork



Enabling Strategic Alignment in the Sales and Operations Planning process

Thesis presented by

Alan Jeremiah (Jerry) Shanahan, BE, MSc

ORCID: 0000-0002-0059-6225

for the degree of

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University College Cork

Cork University Business School (CUBS) - BIS

Head of School/Department: Professor Frederic Adam

Supervisors: Professor Frederic Adam & Doctor Seamus O'Reilly

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Declaration

This is to certify that the work I am submitting is my own and has not been submitted for any other degree, either at University College Cork or elsewhere. All external references and sources are clearly acknowledged and identified with the contents. I have read and understood the regulations of University College Cork concerning plagiarism and intellectual property.

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Abstract

Organisations have struggled to leverage their Sales and Operations Planning (S&OP) processes to deliver the growth expectations of the business, as defined by their strategy. Despite the promise of Strategic Alignment (SA) built into the S&OP process definition, practice has shown that while organisations get value from balancing supply to demand, they struggle to make longer-term strategic decisions, due to not achieving strategic alignment.

The purpose of this research was to investigate what factors and approaches could be identified to enable organisations to achieve 'SA in S&OP'. The research journey, adopting a critical realist research philosophy, involved a number of steps supporting the development of an evolving conceptual framework. Insights from theory and practice were explored in an iterative manner before the final synthesis was concluded. An Integrative Literature Review (ILR) of existing literature, across a range of mixed method academic studies and practitioner publications, enabled the identification of key constructs and relationships. The resulting conceptual framework, associated research propositions and research questions, were then explored by a group of acknowledged experts in a Delphi field study. Returning to the academic literature the next step identified three relevant theoretical lenses to provide a theoretical grounding to the framework in the form of Contingency Theory (CT), Resource Based View (RBV) and Dynamic Capabilities View (DCV) theories. Finally an intrinsic single case study allowed an in-depth investigation to determine to what extent the conceptual framework was reflective of best practice.

The findings showed that four contingency variables (Education, S&OP maturity, S&OP scope, Strategic plan) support the building of five response variables (Product portfolio management, strategic projects management, strategic KPIs, Integrated business plan, assumptions management) to enable SA, demonstrated by strategic discussions and ultimately strategic decision making. An intangible growth mindset developed from the iterative monthly cycle of striving to achieve a fit between the contingency and response variables, leveraging a set of S&OP principles, is an essential ingredient to achieving SA.

This research makes a key contribution to practice in providing guidance for organisations on how to achieve 'SA in S&OP', based on a theoretically grounded framework, expanding the utility of the theories of CT, RBV/DCV.

CHAPTER 1: INTRODUCTION

1.0 Problem Statement

Since the introduction of the Sales and Operations Planning (S&OP) process to the business world in the 1980s (Sheldon, 2006), manufacturing businesses across many industries have benefited from having a formal approach to their medium term business planning. However most fail to realise the full ambition inherent in the definition of the S&OP process (see section 1.3 below for definition) to align the organisation with the strategic direction of the business (Turner, 2018). This can result in a perception of the S&OP process as solely a supply chain process to support the balancing of supply to demand, without recognising that it is intended as a business process to support organisations deliver on their strategic plan. By not aligning the S&OP process to the strategic plan, organisations miss out on the opportunity to proactively manage their business. As such, the proactive decisions required to achieve strategic growth targets are not visible in the process. This results in short-term reactionary decisions and a failure to leverage the full ambition of the S&OP process and the associated benefits for the business.

The academic community recognise the importance of the S&OP process and there have been many academic studies on the process over the last twenty years (reviewed in Chapter 2). However, to date there are no studies that specifically address the challenges inherent in achieving strategic alignment in S&OP, but there are many examples of where the academic community are calling for such studies. Examples include Tuomikangas and Kaipia (2014), Kreuter et al. (2021b) and others that are discussed in Chapter 2. Such calls for action indicate that the academic community appreciate the importance of this topic.

The researcher approached this research with over twenty-five years' experience with the S&OP process, including ten years as a business consultant in the S&OP arena. First-hand experience has shown that organisations genuinely struggle to achieve strategic alignment in S&OP, despite the recognition that it is an expectation of the process.

Therefore, in positioning the research problem there is definite merit in conducting this research on strategic alignment in S&OP, based on:

⇒ The definition of the process sets the expectation for strategic alignment.

⇒ Practitioner literature highlighting the challenges that organisations face when trying to achieve strategic alignment.

⇒ Academic literature calling for research studies in this space.

⇒ Extensive experience of the researcher seeing the challenges first-hand that organisations encounter.

1.1 Research Objective

The objective of this research is to gain an understanding of the factors and approaches that enable organisations achieve Strategic Alignment (SA) in S&OP. By doing so it seeks to help organisations to extract the optimum value from their investment in their S&OP process. The focus is on organisations who operate within the traditional manufacturing operations environment.

The motivation for this research is prompted by the first-hand experience of the researcher. The researcher consistently experienced a reluctance for organisations to make longer-term decisions in the S&OP process, preferring to concentrate on the short-term issues for the business. By not making the longer-term decisions organisations consistently miss the opportunity to proactively take action to offset potential issues for the business, before they become short-term issues that they have to react to. First-hand experience showed that despite explaining to organisations that the S&OP process should be leveraged to deploy the strategy in the business, as well as the focus on balancing supply and demand, the discussions in the S&OP meetings rarely focus on the requirements to deliver the strategic plan. Hence no longer-term decisions are being made.

Having witnessed this practice over many years, the researcher concluded that support to practice could be achieved by stepping back from the consulting role and conducting structured research to understand the dynamics in organisations to enable alignment to the strategic plan of the business, through the S&OP process.

In striving to meet the research objective, a critical realism research philosophy was adopted (described in Chapter 3), investigating the academic scholarly output and practitioner publications on this topic as well as tapping into the first-hand experiences of practitioners in the field (i.e. Delphi study and Case Study). As the research progressed a conceptual

framework evolved, that reflected the contributions made at each stage of the research. The research process is shown in Figure 1. 1.

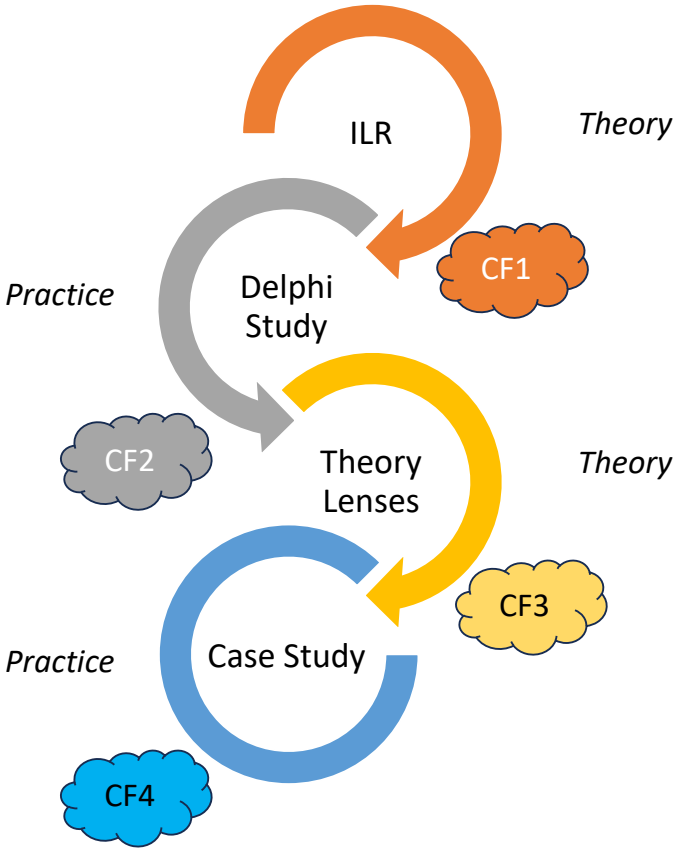


Figure 1. 1: Research process showing evolution of conceptual framework

The Integrative Literature Review (ILR) examined the body of knowledge related to Strategic Alignment (SA) in S&OP across a broad range of academic and practitioner literature. The findings demonstrated that there had been no in-depth academic studies conducted to date and therefore Conceptual Framework 1 (CF1) was heavily influenced by the practitioner literature (Chapter 2). Therefore, it was appropriate to seek input directly from the field as the next step in the research process. This was achieved through a formal Delphi study with a team of recognised field experts in the process of S&OP. The contributions resulted in the evolution of the conceptual framework to CF2 (Chapter 4). At this point the focus returned to the academic community and an investigation into theories that scholars in the field of S&OP had deployed to determine if such theories, or others, could be beneficial in explaining the emerging framework. Considering CF2 through the combined theoretical lenses of three

established theories (Contingency Theory, Resource Based View and Dynamic Capabilities View) informed the framework evolution to CF3 (Chapter 5). The final stage of the research returned to the field environment to establish the relevance of CF3 in practice. An in-depth case study was conducted with a business entity that was acknowledged as successful in achieving 'SA in S&OP'. This afforded the opportunity to assess the explanatory power of CF3 in practice. Based on observing the live process over a three-month period (observing twenty four review meetings) and conducting semi-structured interviews with participants in the process, the learnings resulted in the final evolution of the conceptual framework to CF4 (Chapter 6).

This research contributes to the body of literature on the role of S&OP in manufacturing businesses, putting forward a conceptual framework that addresses strategic alignment in the S&OP process. Furthermore, the use of theoretical lenses demonstrate how established theories can be used in an integrated manner to explain the phenomenon of 'SA in S&OP'. The framework provides guidelines to practitioners on what's involved in 'SA in S&OP' and how to go about achieving it, which has significant relevance for improving practice through supporting organisations to achieve the full ambition from the S&OP process.

1.2 Background to Sales and Operations Planning (S&OP)

Sales and Operations Planning (S&OP) emerged as a defined process in the early 1980s (Sheldon, 2006), evolving from the earlier work on aggregated production planning (APP) and the more expansive process of manufacturing resource planning (MRPII). One of first books written to describe the process was by Ling and Goddard (1988). They described the process as "*the necessary link between the company's business plan and the operations of each department*", (Ling and Goddard, 1988, p.6).

A more expansive definition for the process is provided by APICS (American Production and Inventory Control Society):

"A process to develop tactical plans that provide management the ability to strategically direct its business to achieve competitive advantage on a continuous basis by integrating customer focused marketing plans for new and existing products with the management of supply chain. The process brings together all the plans for the business (sales, marketing, development, manufacturing, sourcing and financial) into one integrated set of plans."

APICS Dictionary, 15th Edition (APICS, 2016:164), Pittman (2016)

The process has evolved since its inception over 40 years ago and is used by many organisations today as a strategic weapon in a very competitive world. In particular the process is widely deployed in manufacturing organisations across a broad range of industry sectors, to address the challenge of synchronising the many plans that can exist (e.g.:- Product Plans, Demand Plans, Supply Plans, Financial Plans, Marketing Plans) and ensure the organisation is fully aligned behind an integrated plan to deliver the long-term strategic goals of the business. As such, if the full ambition of S&OP is realised, the review meetings within the process (see Figure 1.2) become the core governance process for a given business, where key decisions are made to adjust plans over a tactical horizon (24-36 months) to provide the best opportunity for the organisation to deliver on its strategic plan for the business. These review meetings occur every month setting a 'drumbeat' of review meetings whereby senior management in the organisation are afforded the opportunity to make key decisions to positively align future plans to the strategic direction. Because of the monthly drumbeat, the expectation is that a learning environment is created through the constant monitoring of the business, supporting better decision making over time.

While businesses may deploy other governance processes for making key planning decisions, in manufacturing organisations in particular, S&OP has continued to grow in deployment over the years and even though there may be different names used, the popularity of the process is best represented by the vast number of consulting companies that are available to help organisations with their implementations (e.g.:- Oliver Wight, Boston Consulting Group, McKinsey, Deloitte, Ernst & Young). The monthly drumbeat of the process ensures a continuous monitoring of future plans relative to current performance and future expectations. This is an important feature of S&OP whereby it goes beyond the advantages of monitoring current performance in a timely manner, to ensure that this information is used to temper future plans and ensure the plans have a realistic footing. One could imagine if Cisco Systems had deployed such a system back in 2001 they may have achieved real value from their *"virtual close and continuous monitoring process"* and avoided the $2B inventory write-off when their future plans were not sufficiently connected to the real-time monitoring of their financials (O'Leary, 2012).

One attempt in practice to try and re-focus organisations on the expectations of the process to achieve alignment to the strategic plan of the business, came about when the Oliver Wight consulting organisation launched a process called Integrated Business Planning (IBP). The justification was based on the premise that traditional S&OP implementations were owned by

the supply chain organisation and had a primary focus of ensuring supply was balanced with demand. Therefore as defined in their book that explains the transition from S&OP to IBP (Palmatier and Crum, 2013) the Oliver Wight organisation positioned IBP as an advanced form of S&OP that would ensure that strategic alignment was a prime focus. They recognised the importance of proactively managing the product portfolio in particular when aligning to the strategic plan, so as well as a name change, the Oliver Wight company defined an extra step in the process focused on Product Portfolio Management (PPM). Despite the attempt to bring an enterprise focus to business planning through the shift from S&OP to IBP, practice would indicate that when it comes to making the longer-term decisions in support of delivering the business strategy, organisations still struggle. An article by Sorensen (2020) captures the issue:

"IBP has the potential to create significant value for GMs. However, many fall short of achieving it, primarily because they employ tactical IBP", p45.

Sorensen argues in practice, that despite the name change from S&OP to IBP, organisations primarily remain focused on what he calls *"Tactical IBP"* (short-term focus) as opposed to *"Strategic IBP"* (longer-term focus).

The difference in structural terms between the traditional S&OP process and IBP is shown in Figure 1.2. As shown, the traditional S&OP structure (Wallace and Stahl, 2008, Lapide, 2011), is encapsulated within the core structure of the IBP process with the addition of the PPM (Product Portfolio Management) review. In addition the 'Pre-Meeting' is relabelled as "Integrated Reconciliation Review" in IBP (Palmatier and Crum, 2013) to emphasise the need to reconcile all plans (including financial) into one integrated plan.

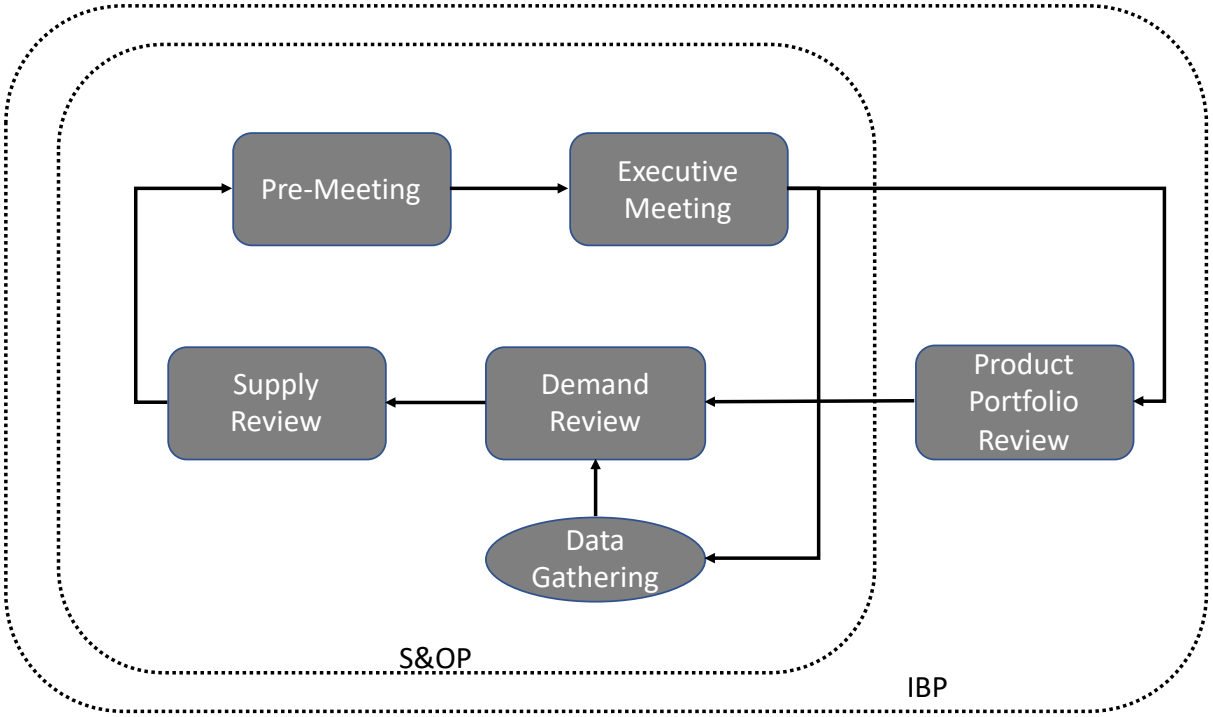


Figure 1. 2: IBP Process encapsulating all elements of S&OP process

The structure supports the premise that IBP incorporates all of what is involved in S&OP with the addition of the Product Portfolio Review in support of the alignment to the strategic plan.

Today, Integrated Business Planning (IBP) is a process that is widely deployed in practice and yet has received very little attention in the academic community. The reason for this is that the academic community maintain their attention on the process of Sales & Operations Planning (S&OP) with some authors acknowledging IBP as a mature version of S&OP (Naslund and Williamson, 2017, Schlegel et al., 2021).

A comparison of the published definitions of S&OP and IBP would indicate that the ambition of both processes is essentially the same.

There is no APICS definition for IBP but the Oliver Wight International organisation, who are credited with developing IBP, put forward the following definition:

"A formal process led by senior management that evaluates and revises aggregate time-phased projections for product, demand, supply, strategic projects, and the resulting financial plans. This is done on a monthly basis on a planned 24-36 month rolling horizon. It is a decision-making process that realigns the tactical plans for all business functions in all geographies to support the company's business strategy. A primary objective of the process is

to reach consensus on a single operating plan, to which executives of the management team hold themselves accountable and allocates the critical resources of people, equipment, inventory, materials, time, and money to most effectively satisfy customers in a profitable way."

Oliver Wight (2020)

To compare the two definitions, it is helpful to introduce some other terminology from the literature – that of *horizontal alignment* and *vertical alignment*. The terms are explicitly defined in the literature with vertical alignment referred to as *"the configuration of strategies, objectives, action plans, and decisions through the various levels of the organisation"*, while horizontal alignment *"can be defined in terms of cross-functional and intra-functional integration"* (Kathuria et al., 2007, p505). A dissection of the S&OP and IBP definitions using a horizontal and vertical alignment perspective is shown in Table 1.1.

Table 1. 1 Comparison on definitions of S&OP and IBP

	S&OP Definition (APICS, Pittman, 2016)	IBP Definition (Oliver Wight, 2020)
Horizontal Alignment	*The process brings together all the plans for the business (sales, marketing, development, manufacturing, sourcing and financial) into one integrated set of plans*	*A primary objective of the process is to reach consensus on a single operating plan, to which executives of the management team hold themselves accountable and allocates the critical resources of people, equipment, inventory, materials, time, and money to most effectively satisfy customers in a profitable way*
Vertical Alignment	*A process to develop tactical plans that provide management the ability to strategically direct its business to achieve competitive advantage on a continuous basis*	*It is a decision-making process that realigns the tactical plans for all business functions in all geographies to support the company's business strategy.*

Table 1.1 shows that while phraseology may be different, the ambition as set out for the S&OP process is essentially the same as the ambition set out for the IBP process. Both definitions include horizonal and vertical alignment across the business.

The academic literature acknowledges that it can take time for a given S&OP process to reach a level of maturity to realise the full ambition as per its definition and there are many maturity models to map out this journey through a series of phases, building capability along the way (Thomé et al., 2012b, Danese et al., 2018). Based on the existing maturity models Danese et al. (2018) proposed a theoretical framework for the purpose of understanding how organisations should go about maturing their S&OP process to progress from Stage 1 through to Stage 5. Significantly they described the final stage as *"almost utopian"* for most companies when there would be "*an emphasis on long-term strategic plans to support the company's growth plans"* (Danese et al., 2018, p2041). This *utopian* perspective on strategic

alignment achievement is reflected in practice where many authors have highlighted the failure of organisations to achieve it (Bower, 2006, Alexander, 2013, Turner, 2018). There has been little academic contribution addressing the topic of strategic alignment, with the majority of studies firmly focused on the supply chain alignment (horizonal alignment) aspects of the S&OP definition – examples include Olhager et al. (2001), Thomé et al. (2012b), Tuomikangas and Kaipia (2014) and Goh and Eldridge (2019).

In essence, over time S&OP in practice has confined itself to the supply chain alignment ambition as set out in the APICS definition. Academia appear to have followed suit by focusing research studies on the supply chain alignment aspects, while still calling for research to be conducted on the strategic alignment aspects (Tuomikangas and Kaipia, 2014, Kristensen and Jonsson, 2018, Kreuter et al., 2021b). The research outlined in this thesis is a response to these calls for action.

One explanation as to why organisations struggle to get beyond supply chain integration with their S&OP processes is put forward by Alexander (2013). He describes a paradox which he labels *"the Control – Growth Paradox"* (Alexander, 2013, p.18). He describes the often opposing tensions within an organisation to drive for the pursuit of *growth*, while having a strong desire to stay in *control.* Alexander (2013) goes further to propose that historically S&OP had grown from a control mindset and therefore focused heavily on how best to align supply plans with the requirements of demand plans. In order to have a process that genuinely focuses on delivering the strategy, requires a growth mindset and as such requires a strong focus on all the new growth areas through innovation, new products, new markets, new services etc. While historically the term "growth" would assume the focus on the financial targets for a business, in today's world "growth" could just as well be about achieving ESG targets (Environmental, Social, Governance). Equally it could be about building a desired culture through growing employee engagement. Having said that, in a recent survey by the Gartner group they identified that the number one strategic target for CEOs (Chief Executive Officers) and CFOs (Chief Financial Officers) continues to be *profitable growth* (Turner, 2023). The concept of building a "*Growth Mindset"* is something that surfaces in the literature review (Chapter 2) and continues as an element of the evolving conceptual framework with a growing understanding of how to go about developing it. The case study (Chapter 6) brought much clarity to this intangible topic.

As organisations continue to struggle to achieve strategic alignment in S&OP, over recent years with the advancements in Information Technology (IT), some practitioners think the

answer is to bolster S&OP/IBP with predictive software capabilities. One such company has been trying to coin another name for the process called *"Intelligent IBP"* (Van Hove, 2022). However, as this research will demonstrate, the issue of attaining 'SA in S&OP' is not about IT tools or what the name of the process is called. It is much more about developing the right culture and organisation mindset. As such it is about coming to the realisation that 'SA in S&OP' is a social phenomenon and the research methodologies deployed (Chapters 2 & 3) reflect this.

With the academic focus on S&OP, when researching the specific topic of Strategic Alignment (SA) the literature searches in the academic body of knowledge concentrated on S&OP (Chapter 2). The challenge that practitioners are experiencing with achieving strategic alignment is reflected in the literature review, with practitioner articles making a significant contribution to explaining what is involved and suggesting what is required to achieve 'SA in S&OP'. When field research was conducted through the Delphi study (Chapter 4) and the Case Study (Chapter 6) the focus was on experts and organisations who would have been regarded as experienced and mature in S&OP and as such were running IBP processes.

In summary, IBP is a mature form of S&OP and while it did evolve from S&OP, the practical implementation shows that the process encompasses all the aspects of S&OP but has extra constructs, specifically focused on PPM. However, by definition both processes expect strategic alignment as a core construct when implementing the process. Therefore, throughout this thesis the terms S&OP and IBP are used depending on the context, while recognising as it relates to the research objective, many organisations whether running S&OP or IBP continue to struggle to achieve strategic alignment.

1.3 Strategic Alignment in Sales and Operations Planning (S&OP)

To understand the definition of strategic alignment as it relates to S&OP/IBP, it is informative to consider the typical planning levels and their associated planning horizons, as put forward by Stadtler et al. (2015), who in turn reference the seminal work by Anthony (1965). They define them as:

- Long-term planning, driving strategic decisions over a multiple year timeframe.
- Mid-term planning, driving tactical decisions, over the time period of 3 to 24 months' timeframe.

- Short-term planning, driving short-term decisions over a period between a few days up to 3 months.

In his work on planning and control systems (Anthony, 1965) described the three levels as *"Strategic Planning", "Management Control"* and *"Operational Control"*. In later years the term *management control* evolved to what is commonly termed as *"tactical planning"* (Gorry and Morton, 1989). In this context it is well established in the literature that S&OP operates in the tactical planning horizon with strong linkages to the strategic and operational planning levels (short-term planning) as outlined by Pereira et al. (2020), Nabil et al. (2018), Kristensen and Jonsson (2018), Thomé et al. (2012b) and Olhager et al. (2001). The vertical alignment aspect of the S&OP definition can therefore be broken into two distinct alignment expectations - Strategic Alignment (SA) and Operational Alignment (OA) as shown in Figure 1.3.

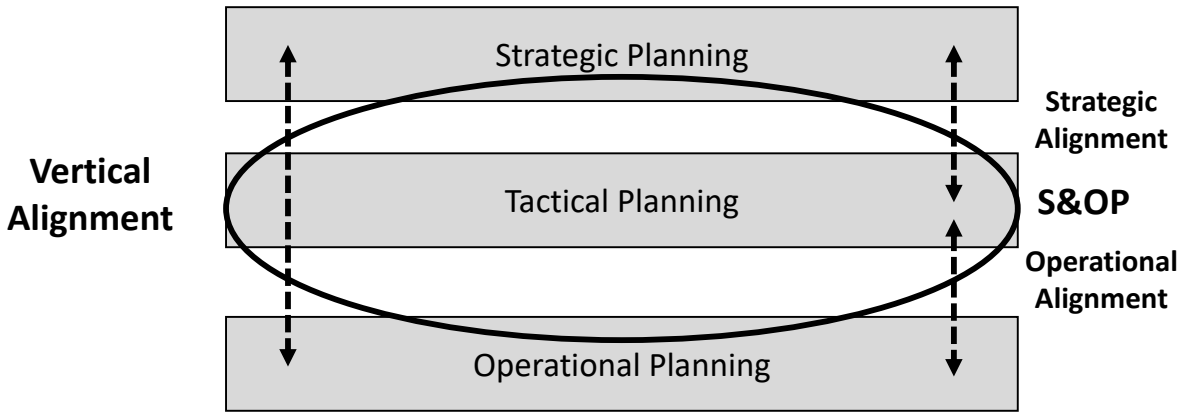


Figure 1. 3: S&OP Vertical Alignment across planning levels

The focus of this research is specifically on the Strategic Alignment (SA) aspects of the S&OP/IBP process. As such, in support of the research objective, it is about understanding *what* is involved in SA, and *how* organisations should go about achieving it.

In line with the APICs definition of S&OP (Pittman, 2016) and the Oliver Wight definition for IBP (Oliver Wight, 2020), achieving strategic alignment is a core expectation of a S&OP/IBP process that is operating to full scope and capability. The ultimate value of the

S&OP/IBP process is to make decisions to positively influence the future performance of the business:

"Furthermore, it should not be understood as only "planning", but mainly as a management "decision-making" process." – Jurečka (2013, p.30).

"The S&OP process needs to be one of the key meetings for an organization where decisions are made to help the organization achieve its business, strategic and financial goals." – Dunn (2019, p.29).

Therefore, the key value obtained from achieving strategic alignment is that it can enable strategic decisions to be made. In order to clearly define the boundaries of this research, the definition of strategic decision making in S&OP was explored.

In 1976 Henry Mintzberg, along with his colleagues Duru Raisinghani and André Théorêt, delivered a paper following a longitudinal case study of 25 strategic decision processes in the field (Mintzberg et al., 1976). They began by defining a 'decision' as *"a specific commitment to action (usually a commitment of resources)."*. Qualifying decisions as 'strategic', they state: "*And strategic simply means important, in terms of the actions taken, the resources committed, or the precedents set."* (Mintzberg et al., 1976, p.246). This definition was also accepted by Eisenhardt and Zbaracki (1992) when researching the dominant paradigms in the literature related to strategic decision making.

In the context of S&OP, there is a monthly process cycle during which each of the S&OP meetings is presented with the latest view of future plans. These plans are compared against the expectations of the business performance for the future, as set out in the strategic plan of the business. This creates a "top down" (strategic plan) versus "bottom up" (latest S&OP plan) comparison, and when there is a gap between the two, a decision needs to be made to close the gap (see Figure 1.4).

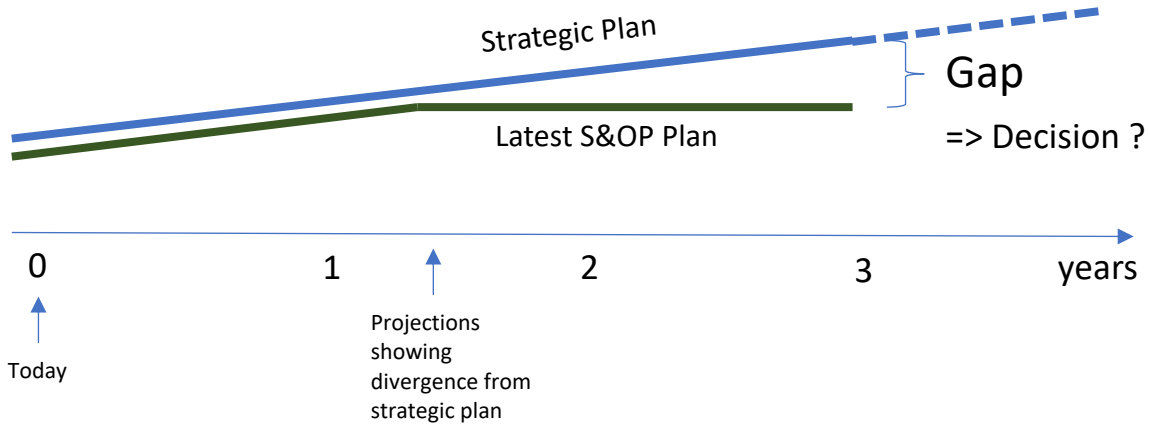


Figure 1. 4: Gap created when latest plan is not aligned with strategic plan

In simple terms, if the gap is to be closed to achieve realignment between the S&OP plan and the Strategic plan then it will involve one of three decision scenarios:

(i) Actions are committed that will enable the adjustment of the latest S&OP plan (bottom up) to realign to the existing strategic plan.

(ii) Actions are committed to adjust the strategic plan (top down) to align to the latest S&OP plan.

(iii) A combination of both where some actions are committed to move the S&OP plan closer to the strategic plan but in order to achieve alignment, the strategic plan will need adjusting also.

The conclusion of whether the decisions to commit to the appropriate gap closing actions are 'strategic' is dependent on the horizon that the gap relates to. As addressed earlier, S&OP operates in the 'tactical' planning horizon with linkages to the short-term 'operational' planning horizon and the longer-term 'strategic' planning horizon. Adding another contextual element as it relates to this study, in a traditional manufacturing environment, the 'top down' plan will be broken down into an annual budget, covering a given fiscal year (12 months), with the strategic plan providing the 'top down' guidance out to 5+ years (Dougherty and Gray, 2013).

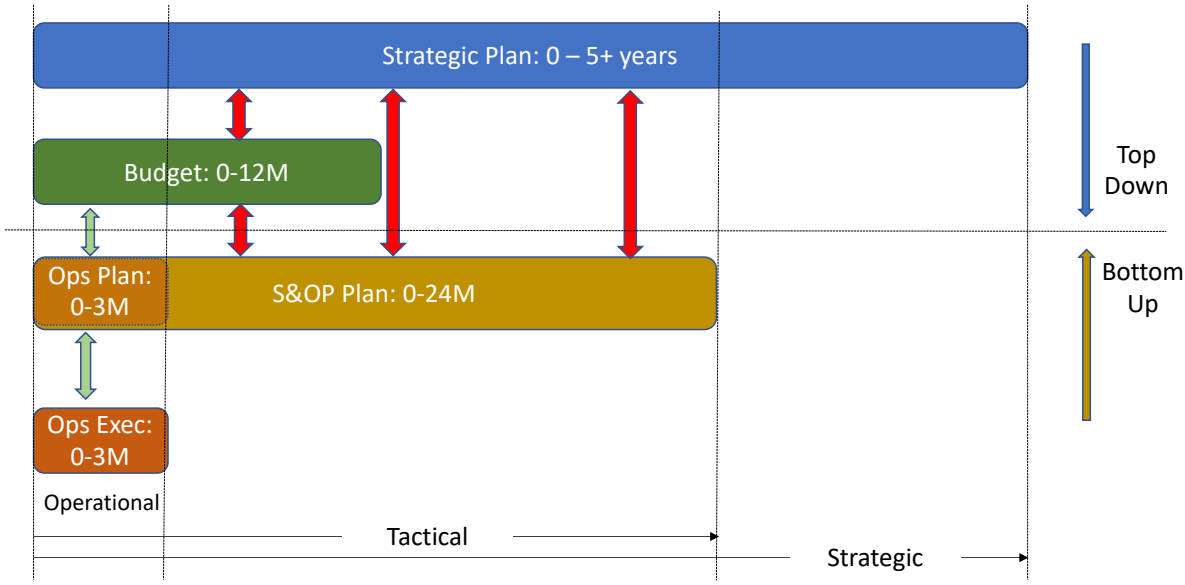


Figure 1. 5: Strategic Decision Making in S&OP

As is shown in Figure 1.5, in addressing any strategic gaps between the 'top-down' and 'bottom-up', S&OP, while operating in the 'tactical' planning horizon, will enable decisions that have an impact to the strategic plan (red double arrows). Therefore, the definition of "strategic decisions within S&OP" as it relates to SA for this research is as follows:

Definition: *A strategic decision within S&OP is an action taken in response to a gap between the latest S&OP plan and the Strategic Plan. It is made within the S&OP tactical horizon in order to achieve strategic alignment between both plans.*

As show in Figure 1.5, within S&OP it is expected that such decisions are made in a window that is greater than 3 months and less than 24 months (and up to 36 months in some instances).

Reflecting on Mintzberg et al. (1976, p.246), the definition for strategic decision making in S&OP, is *"a specific commitment to action"* prompted by the gap analysis between the strategic plan and the S&OP plan. Because such actions are driving actions to maximise the opportunity of delivering the future plans for the business, they are *"important"* and will require key *"resources committed"* and are likely to set "*precedents"* for the future.

1.4 Thesis Structure

This thesis is organised as shown in Figure 1.6.

The process flow showing the shifting focus between theory and practice is represented in Figure 1.6. This introduction (Chapter 1) positions the research problem, research objective and approach taken, as well as defining some key terms used throughout the document. Chapter 2 describes the Integrative Literature Review conducted to investigate existing contributions in support of the research objective. Chapter 3 describes the research philosophy and the methodologies deployed when conducting the field investigations of the Delphi study and Case Study. The details of the Delphi field study and findings are described in Chapter 4. Chapter 5 identifies relevant theories that were leveraged to inform the evolving conceptual framework. The Case Study field research and findings are described in Chapter 6. Finally Chapter 7 reflects on the original research problem and objective and proposes the contribution to theory based on the findings and the implications to practice. Chapter 7 also reflects on the limitations of the study and recommendations for future research.

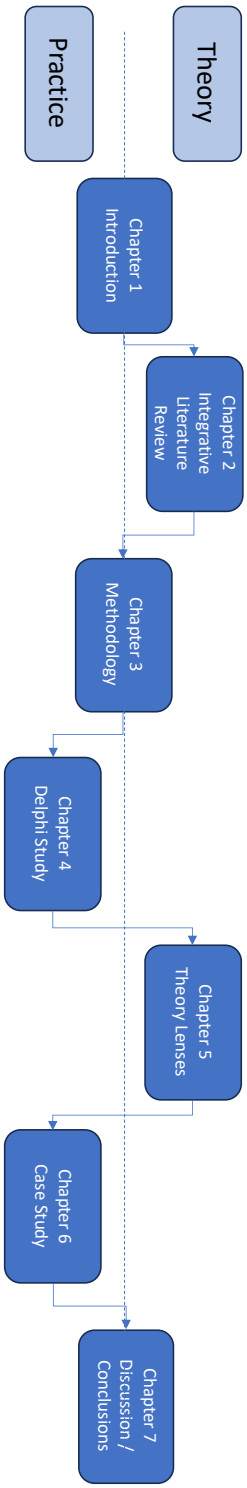


Figure 1. 6: Thesis Structure

CHAPTER 2: INTEGRATIVE LITERATURE REVIEW

2.0 Introduction

As described in Chapter 1 (section 1.3), Sales and Operations Planning (S&OP) emerged as a defined process in the early 1980s (Sheldon, 2006), evolving from the earlier work on aggregated production planning (APP) and the more expansive process of manufacturing resource planning (MRPII). The process has evolved greatly since the 1980s and there have been a number of literature reviews over the last twenty years. These reviews include six Systematic Literature Reviews (SLRs) synthesising the overall state of the art in this field - Thomé et al., (2012a) investigated the role of S&OP as a determinant of supply chain performance, Thomé at al. (2012b) proposed a contextual framework for S&OP, Tuomikangas et al. (2014) put forward a co-ordination model for S&OP, Noroozi et al. (2017) built an integrative S&OP framework based on decoupling points in the process industry, Kristensen and Jonsson (2018) synthesised the literature using a contingency research framework based on contextual, response and performance variables and finally Kreuter et al. (2021) had a specific focus on empirical studies on S&OP. Each of these SLRs while focusing from differing research angles, called for further research to be conducted into the area of Strategic Alignment (SA) within S&OP.

The importance of achieving 'SA in S&OP' has been a topic of interest in practitioner literature for many years. Examples include Bower (2005), Baumann (2009), Lapide (2011), Alexander (2013), Van Hove (2016), Turner (2018) and Dunn (2019). All of these authors advocate that the full value of S&OP can only be realised if strategic decision making is enabled through structured SA. The research community have acknowledged that research into the vertical alignment aspects of S&OP, which includes strategic alignment as well as operational alignment, has been distinctly lacking and have called for research focused on this aspect of S&OP. Indeed, as recently as 2021 a systematic literature review conducted by Kreuter et al. (2021b), conclude with a call for further research to define the "*vertical integration"* aspects of S&OP.

As a starting point for this research a review of the literature was conducted with key themes identified that described SA. This informed a conceptual framework providing guidance on how to go about achieving 'SA in S&OP'. This framework provided the basis for the research

agenda to further investigate this phenomenon, including specific research propositions and associated research questions.

The investigation goes beyond publications that just focused on "why" SA was important and extracted elements associated with "how" to achieve 'SA in S&OP'. To achieve this, it was essential to look beyond the academic journals and include practitioner literature. Practice has been continually leading academic research over the years, as highlighted by Tuomikangas and Kaipia (2014), Noroozi and Wikner (2017a), Kreuter et al. (2021b). As this study reviews a range of literature that adopt various perspectives and employ a variety of methods, the literature review approach adopted was an Integrative Literature Review (ILR) as outlined by (Torraco, 2016) and described in detail in the methodology section (2.2). The ILR method is appropriate when one is looking to map out *"a research agenda that flows logically from the critical analysis of the literature*" (Torraco, 2016, p.421). In analysing the literature, descriptive and causation coding techniques (Saldana, 2013) were deployed, along with Qualitative Content Analysis (QCA) to determine what themes were manifest and how they were related (Vaismoradi and Snelgrove, 2019).

This chapter is structured as follows: Firstly S&OP is defined and in particular SA within S&OP. This is followed by a section that considers design features of S&OP drawing on strategic decision-making and IT literatures. The methodology section then describes the ILR and the approach to analysis. The results of the synthesis from the literature review are presented in the subsequent section. Finally a discussion of the findings that inform the research agenda for 'SA in S&OP' is presented, including a conceptual framework, research propositions and associated research questions.

2.1 Strategic Alignment (SA) within Sales and Operations Planning (S&OP)

Many of the papers addressing S&OP over the years include a definition for the process, examples include: Grimson and Pyke (2007), Thomé et al.(2012b), Tuomikangas and Kaipia (2014), Pedroso et al.(2016), Pedroso et al. (2017), Kristensen and Jonsson (2018), Pereira et al.(2020). In each of these studies, the definition of S&OP put forward typically focuses on alignment and integration across the supply chain, as well as achieving alignment and

integration with the business strategy. Taking the earlier review by Grimson and Pyke (2007) as a typical example, they define S&OP as follows:

"S&OP is a business process that links the corporate strategic plan to daily operations plans and enables companies to balance demand and supply for their products".

Grimson and Pyke (2007, p.323).

Inherent in this definition are two explicit objectives for the S&OP process – *"link strategic plan to operations plans"* and *"balance demand and supply"*. Two terms to describe each of these objectives that are most prominent in the literature are *"vertical alignment"* and *"horizontal alignment"* respectively as evidenced by Kristensen and Jonsson (2018), Wagner et al. (2014), Tuomikangas and Kaipia (2014), Hulthén et al. (2016), Nabil et al. (2018), Goh and Eldridge (2019). In this context, the terms are explicitly defined by Kathuria et al. (2007) with vertical alignment referred to as *"the configuration of strategies, objectives, action plans, and decisions through the various levels of the organisation"*, while horizontal alignment *"can be defined in terms of cross-functional and intra-functional integration"* (Kathuria, Joshi et al., 2007, p.505).

Such vertical alignment in S&OP seeks to align decision-making at various planning levels. As described in Chapter 1 (section 1.4.2), the typical planning levels and their associated planning horizons are *long-term planning, mid-term planning (or tactical planning)* and *short-term planning* (Gorry and Morton, 1989). S&OP operates in the tactical planning horizon (see section 1.4.2) with strong linkages to the strategic and operational planning (short-term planning) levels.

At the heart of SA is the enablement of decision making. While S&OP is primarily operating in the tactical planning horizon up to 24 months (or 36 months in some industries), it requires decisions within the S&OP process that aim to positively influence the attainment of the longer-term strategic plan goals. Examples of such decisions include investments in capacity in order to meet the future manufacturing strategy (Olhager et al., 2001) or decisions around the profile of new product introductions to meet the strategic goals of the company (Jurečka, 2013). Even when the implementation timing of these activities is outside the S&OP tactical horizon, the decision to deploy resources to bring about the change may well fall inside the tactical horizon and therefore such decisions need considering in the S&OP process.

While scholarly attention to S&OP has been growing over the last 10 years, the primary focus in terms of building instructive frameworks has been concentrated on the horizontal aspect of

the S&OP definition; namely, the alignment and integration across the supply chain, with a focus on supply/demand balancing. Notwithstanding recognition of the SA aspects, research that goes beyond "why" SA is important and addresses the "what" and "how" of SA, are quite sparce, indeed where addressed typically it is not core to the research focus.

Research on S&OP over the last twenty years has been synthesised at various intervals thanks to six systematic literature reviews (Thomé at al., 2012a; Thomé et al., 2012b; Tuomikangas et al., 2014; Noroozi et al., 2017; Kristensen and Jonsson, 2018; Kreuter et al., 2021). These reviews point to a focus on the horizontal alignment aspects of S&OP and highlight the need to address SA. Examples of such calls from the literature are listed in Table 2.1.

Table 2. 1: S&OP Systematic Literature Reviews

Reference	**Focus of Research**	**Call for Action on Strategic Alignment**
Tuomikangas & Kaipia (2014, p.256)	Building a co-ordination conceptual framework for S&OP	*"Second, we observe that specific coordination mechanisms, particularly strategic alignment and S&OP culture and leadership, deserve more research"*
Noroozi & Wikner (2017a, p.199)	Proposing a S&OP model based on decoupling points driving strategic decision making, in the process industry.	*"Another issue regarding KPMs is that the relation between S&OP-related KPMs and the strategic goals of companies have not been fully covered in the literature"*
Kristensen & Jonsson (2018, p.41)	Proposing contingency research framework for S&OP	*"However, studies exploring these links to higher and lower planning levels are absent in current S&OP research"*
Kreuter et al. (2021, p.28)	Systematic Literature Review on S&OP Empirical Studies	*"…the integration of S&OP with operational and strategic planning processes as well as its connection to supply chain risk management should be studied in future research"*

From a practitioner perspective, there is more focus on the SA aspects. These are covered in detail later in this chapter but are best summarised by Alexander (2013), who refers to *"the Control-Growth Paradox"* (Alexander, 2013, p.18). As referenced in chapter 1, he describes the often opposing tensions within an organisation to drive for the pursuit of *growth*, while having a strong desire to stay in *control.* He argues that historically S&OP had grown from a *control* mindset and therefore tends to be focused heavily on how best to align supply plans with the requirements of demand plans. It is only by recognising the fundamental role that

S&OP has in deploying the strategy, that the process can be orientated towards supporting the delivery of the *growth* targets for the business. With organisations continually working to deliver growth, an understanding of how S&OP can be leveraged to support this through achieving SA is therefore critically important. However, within the academic community to date, there has been only sparce focus on this topic. The importance of this to practice was stated very clearly by Tuomikangas and Kaipia (2014, p.256) when they state (underline added): *"The practitioner literature focused strongly on corporate culture, leadership topics, and strategic alignment topics. These focus areas indicate they are of special interest to practitioners and should also be further explored in academic research*."

When considering the challenges associated with achieving strategic alignment in S&OP in practice, it is informative from analysing the literature that the design of the S&OP process has factored in the learnings from many seminal authors across management and organisational theories. This is positioned in the next section.

2.2 Design features of S&OP based on existing research

In order to be able to *"strategically direct its business"* (as per APICS definition, Pittman, 2016), S&OP is essentially a decision making process, with an emphasis on longer term decisions. Researchers over many years have put forward theories on decision making and advocated for the role of tools, as the capabilities accelerated over time. Reflecting on the design features of the S&OP process, one can identify how the design incorporates the learnings from these researchers.

Some of the key S&OP design features, matching to historical research findings, is shown in Table 2.2 and subsequently discussed:

Table 2. 2: S&OP design features supported by existing research

Design Category	S&OP Design Feature	Supporting Research	Sample Refs
Long-term decision making	Monthly review meetings to evaluate scenarios triggering best choice decisions to offset potential future issues	3 steps of decision making: 1. Listing alternative strategies 2. Determine consequences of these strategies 3. Comparative evaluation of these sets of	Simon (1997)

		consequences	
Long-term decision making	Future is uncertain so focus on trends and being roughly right is better than being precisely wrong	Concept of 'bounded rationality' and 'satisfycing' when making longer-term decisions.	Simon (1979)
Long-term decision making	Bring executives into structured decision making forums on a monthly cycle	Extensive study of executive behaviour showing that they are time poor and therefore longer term decisions tend to be de-prioritised versus the short term issues that attract attention.	Tengblad (2003)
Long-term decision making	Each review meeting is made up of cross-functional teams who can contribute to the decision making	Systems Thinking – Cross functional teams make better decisions than individuals.	Senge (1990)
Long-term decision making	Strategy kept live in the S&OP process through monthly comparison of latest outlook over 24-36 month horizon	When making longer term decisions need to be able to align to the intended and the emergent strategy.	Mintzberg and Waters (1985)
Long-term decision making	Assumptions have to be explicitly stated and reviewed in the monthly meetings	Monitoring key assumptions about the future is necessary to support longer term planning decisions.	Dewar (2002)
Role of IT	Demand, Supply and Inventory management are supported by ERP / APS planning tools (Horizontal Alignment)	ERP & APS systems support efficient and effective planning.	Johnson et al. (2008)
Strategy Implement.	Monthly review to compare latest S&OP plan (bottom-up) against the Strategic Plan (top-down), structured in the form of Strategic Maps.	Having the strategy clearly mapped and conducting regular reviews to track performance relative to the strategy, supports strategy implementation.	Kaplan and Norton (2005a)

Each of the three design categories in Table 2.2 are expanded individually in the next three sub-sections.

2.2.1 Support for long-term decision making

Herbert Simon is one of the seminal authors on decision making and in particular unstructured decision making associated with longer term decisions. He describes the key

steps of identifying alternates and evaluating their impact before making the selection (Simon, 1997), while also introducing the concepts of 'bounded rationality' and 'satisfycing' (Simon, 1979). The acknowledgement that the future is uncertain but decisions still need to be made is fundamental to the design of the S&OP process. However because of the many variables involved, it is not about trying to come to an optimised decision but more about monitoring trends and be satisfied about being roughly right.

Reflecting on the research conducted by Sune Carlson in the 1950s, observing the behaviours of senior executives in Swedish based organisations, over an extended period of time, Tengblad (2003) highlights that a key observation by Carlson was that the diaries of executives were filled with planned and unplanned events dealing with short term issues. Carlson found that despite their best intentions they were 'time poor' and struggled to carve out the time to make the longer term decisions. One of the key design features of S&OP is to have monthly review meetings that are scheduled into the calendars of executives with mandatory attendance. In fact each review is chaired by a senior executive. This structure ensures that specific time is allotted each month to review the longer term issues and make the proactive decisions to offset their impact.

Each review meeting in S&OP is structured to have an appropriate mix of cross functional team involvement which is in line with the systems thinking theory by Senge (1990), for effective decision making. Also, S&OP calls out for explicit identification and review of key planning assumptions, in line with assumptions based planning theory by Dewar (2002), as an enabler to longer term decision making.

One of the seminal authors on strategy development and strategic planning over the years is Henry Mintzberg. While acknowledging the many forms that a strategy can take, Mintzberg and Waters (1985) recognised the dynamic environment that businesses typically operate within. Therefore when making decisions that align plans to the strategy, one has to be cognizant that a strategic plan, while setting out the business intent, is only fully validated at a point in time. As such a process needs to be in place to pay attention to any emergent strategies that may be appropriate, based on the latest environmental landscape. This is a key expected value from how S&OP is designed with at least a monthly comparison over a 24-36 month horizon of how the latest plans compare to the intended strategy. In doing so, the latest environmental conditions are captured in the strategic assumptions and if different to the intended strategy, can trigger adjustments to the strategic plan (emergent strategy).

The final two entries in Table 2.2 deserve a more detailed explanation in the context of the research conducted and so are expanded in sub-sections 2.2.2 and 2.2.3.

2.2.2 The role of IT in S&OP

It is highlighted in Table 2.2 that Enterprise Resource Planning (ERP) and Advanced Planning Systems (APS) are essential planning systems in support of building aligned longer term plans for the business. As acknowledged by Johnson et al. (2008) such systems are about efficiently bringing *control* to the business:

"Enterprise Resource Planning (ERP) planning systems, supplied by software specialists such as SAP and Oracle, use sophisticated IT to achieve planning type control" (p.412)

This control is achieved through effectively planning supply and inventory to meet the future demand expectations, in an optimised manner, based on defined planning parameters in the system. This IT enabled capability supports the *horizontal alignment* expectation of S&OP, as shown in Table 1.1. However, it does not support the *vertical alignment* aspect and in particular supporting the organisation to achieve strategic alignment. Beyond the role of ERP and APS, the IT capability has evolved greatly over the years. When Wendy Robson published the second edition of her book "*Strategic Management & Information Systems"* in 1997, she could foresee the "*clear and obvious role for IS in the number crunching aspects of scenario analysis"* (p.28). However, she proposed that the problem remained for organisations who tended to concentrate too much on gathering data and information as opposed to using the information in an impactful manner (Robson, 1997). According to Ward and Peppard (2004) this can be an issue when the IS/IT strategy is not fully aligned with the business strategy.

Over time the major ERP providers have recognised the need to support S&OP decision making and have built in capabilities to support scenario planning, analytics based analysis and efficiently generating the charts for the S&OP meetings. This effort was most evident with the release of SAP-IBP application in 2014 (SAP, 2014). Other IT providers approached S&OP support by building modules from scratch, as opposed to evolving from the transactional ERP type solutions. This gave early traction to companies like Kinaxis.

As the deployment of S&OP across all business sectors continued to increase, all the major IT vendors produced solutions to support the process (eg:- SAP, Oracle, Blue Yonder, Infor). The solutions incorporate built in big data analytics capabilities and have had an impact in supporting mature S&OP processes (Schlegel et al., 2021).

However, while the S&OP process leverages all of these technologies by providing support for a more efficient process and informed decision making, when it comes to making the longer term decisions, the executive management in the business are still the ones who are tasked at making such decisions. As outlined in the problem description earlier in the chapter, the practical reality is that many organisations continue to struggle with making strategic decisions in S&OP, despite the IT support.

Therefore, what is clear at this point is that IT support is fundamental to achieving the horizontal alignment aspects of S&OP but when it comes to strategic alignment (as part of vertical alignment) it's role is reserved to facilitating scenarios and providing decision support.

2.2.3 Strategy Implementation

As per the definition of S&OP, it was necessary to achieve strategic alignment so that the process can be leveraged to *strategically direct* the business towards delivering it's strategy. In this respect the S&OP process should be a vehicle for strategy implementation. The challenge of translating a strategy documented in terms of vision, mission and strategic objectives into something that the organisation can appreciate and act upon, is a subject that Kaplan and Norton (1992) addressed through the development of the Balanced Score Card (BSC). This provided a mechanism of translating the strategy into strategic goals for the business across the four major perspectives of financial, internal, customer and innovation/learning. The BSC model was enhanced greatly when complemented with strategy maps, which aligned strategic goals and initiatives in the form of strategy maps that aligned to the structure and accountabilities within a given organisation (Lueg, 2015). These maps helped greatly in being able to explain and translate the BSC to each function across the business, giving a perspective of how each function could contribute to delivering the business strategy. As companies adopted the BSC approach, supported by strategy maps, research on actual benefits realised were reserved for laboratory experiments and single case studies (Lueg, 2015). Also, it remained very much a 'top-down' approach for deploying the strategy across the organisation of a given business. Kaplan & Norton identified the need for a structured governance process where performance relative to the strategy could be reviewed and discussions could be had as to whether the strategy maps were in need of updates, based on the latest environmental assumptions. Hence, they proposed a governance system, including periodic senior level reviews, which they called *The Office of Strategy Management* (Kaplan and Norton, 2005a). Such a system would recognise that strategy and

therefore strategy maps need to be dynamic to stay aligned to a changing environment and therefore be ready to be adjusted to what Mintzberg and Waters (1985) and subsequently Ward and Griffiths (1996) refer to as *the emergent strategy* impinging on *the intended strategy*.

The utility of strategy mapping, leveraging the Kaplan and Norton (2007) BSC framework, is described by O'Leary (2021) in the context of the accounting and finance field. He shows how strategy mapping can provide a structured vehicle in support of an *Enterprise Architecture*, essentially translating the business strategy into a format whereby the organisation can align to it and bring about the achievement of the strategic goals.

What is interesting as it relates to S&OP, is that the design of the process takes these challenges into account. The strategy has to be visible and represented in the process in the form of strategic roadmaps (see emphasis put on this by field experts in the finding of the Delphi Study in Chapter 4). In essence it is designed to provide an Enterprise Architecture similar to what is described by O'Leary (2021). In addition monthly forums provide the governance structure to compare the latest outlook against the strategy maps with a goal of triggering decisions to close any gaps that may be evident between the latest outlook and the strategic plans for the business. Therefore, one can argue that the S&OP design incorporates the key features of the BSC and strategy maps and it is one of the reasons why it is positioned as a vehicle for deploying and implementing the strategy for the business.

2.2.4 The challenge of achieving 'SA in S&OP' remains

Despite the design of the S&OP process 'standing on the shoulders' of many years of research into the challenges associated with longer term decision making, organisations in practice continue to struggle to make the expected longer term decisions. As stated earlier (1.1 Problem Statement), organisations struggle to understand how to deliver the strategic alignment expectation to facilitate such decision making. With S&OP as a process being deployed for over 30years at this point, the challenge of 'SA in S&OP' must be a complex phenomenon to address, as acknowledged by practitioners describing the problem (Baumann, 2009, Lapide, 2011, Alexander, 2013, Turner, 2018) and academics calling for more research (Tuomikangas and Kaipia, 2014, Noroozi and Wikner, 2017a, Kristensen and Jonsson, 2018, Kreuter et al., 2021b).

The literature review of broader decision making theory, role of IT and strategy implementation theories in particular supported the need for a very focused investigation of

the literature into the specific phenomenon of 'SA in S&OP', to understand how to enable SA within the constraints of the S&OP design. The methodology used to investigate the literature through this focused lens is described in the next section.

2.3 Methodology

S&OP is recognised as an emerging topic in Operations Management (Kreuter et al., 2021, p.2). To support the extraction of key contributions, across multiple studies, employing various methodologies (including practitioner publications), an Integrative Literature Review (ILR) approach was deployed as an appropriate approach when looking to bring forward new insights on an emerging topic or at a minimum to define the research agenda (Souza et al., 2010, Torraco, 2016). While every integrative synthesis will have elements of interpretation (Dixon-Woods et al., 2004), ILRs differ from the more traditional Systematic Literature Reviews (SLRs) in this regard with attention focused on the manifest insights from the coding of literature transcripts.

A robust review process was followed, which is critical to address previous criticisms where ILRs were deemed as mere summaries of studies and not truly integrative (Snyder, 2019). A number of such structures were reviewed and found to be similar in approach, Cooper (1982), Whittemore and Knafl (2005), Souza et al. (2010). The 5-Stage process of problem identification, literature search, data evaluation, data analysis, presentation, as put forward by Whittemore and Knafl (2005), was followed in this study. As this is an emerging topic, an inductive approach to theory building was required and Qualitative Content Analysis (QCA) techniques (Williams and Moser, 2019) were employed to code relevant data extracts and analyse for appropriate themes.

2.3.1 Literature Search

To ensure the retrieval of a broad scope of relevant articles, databases associated with Operations Management, Organisation Management and Social Science, namely EBSCO, ProQuest, Scopus, Science Direct and Web of Science, were searched (Whittemore and Knafl, 2005, Cooper, 1982). Thus, practitioner articles and academic contributions on the topic of S&OP were included in the search. The following search logic and keywords were used to ensure an initial scope of potentially relevant articles were identified : Title contains "S&OP" OR "Sales and Operations Planning" OR "IBP" OR "Integrated Business Planning" AND Keywords=Strategy OR Strategies OR Strategic OR "Vertical Alignment" OR

"Vertical Integration". There was no time constraint in the search, allowing inclusion of articles up to and including July 2023. Periodicals were not considered to avoid potentially biased supplier content and only English language articles were included. Once duplicates were removed, the remaining body of literature was interrogated to determine which articles provided insights into the topic. This required a detailed review of the full text of the articles. Articles were subsequently excluded if they did not contribute to elucidating the topic of 'SA in S&OP', as per the defined exclusion criteria (Figure 2.1). The final step to deliver the corpus of papers, involved picking additional articles that were cited in the selected articles but did not emerge based on the search criteria used (snowballing). A summary of the overall search process is depicted in Figure 2.1.

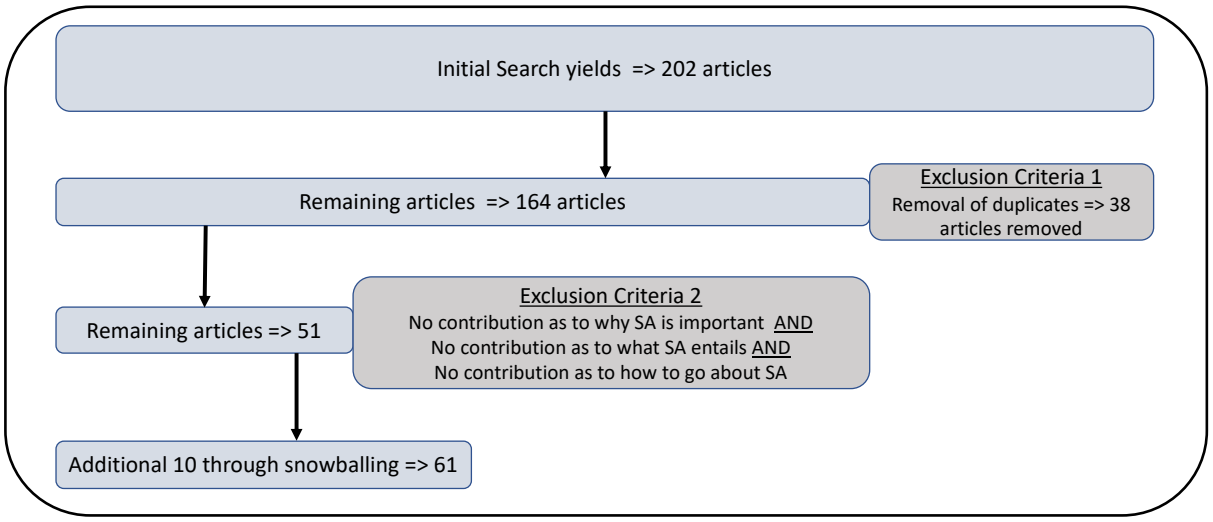


Figure 2. 1: Search and Filtering Process Deployed

Of the 61 articles analysed, 31 were from academic publications and 30 were from practitioner publications (Figure 2.2). The largest number of articles were from two practitioner publications, *The Journal of Business Forecasting* and *Supply Chain Management Review.* The largest sources of academic knowledge were from the *International Journal of Production Economics* and the *International Journal of Physical Distribution & Logistics Management* (see Figure 2.3)

The source of the publications in terms of academic versus practitioner over the years is shown in Figure 2.2.

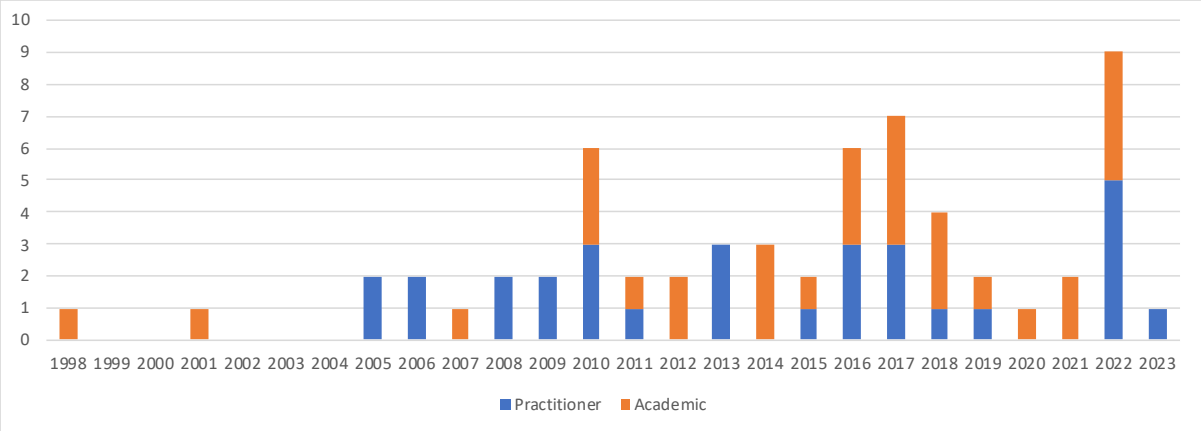


Figure 2. 2: Publications by year: Academic (N=31) and Practitioner (N=30)

As can be seen in Figure 2.2, the role of 'SA in S&OP' emerged as a subject of interest over the last 15 years, with most of the academic publications over the last 10 years.

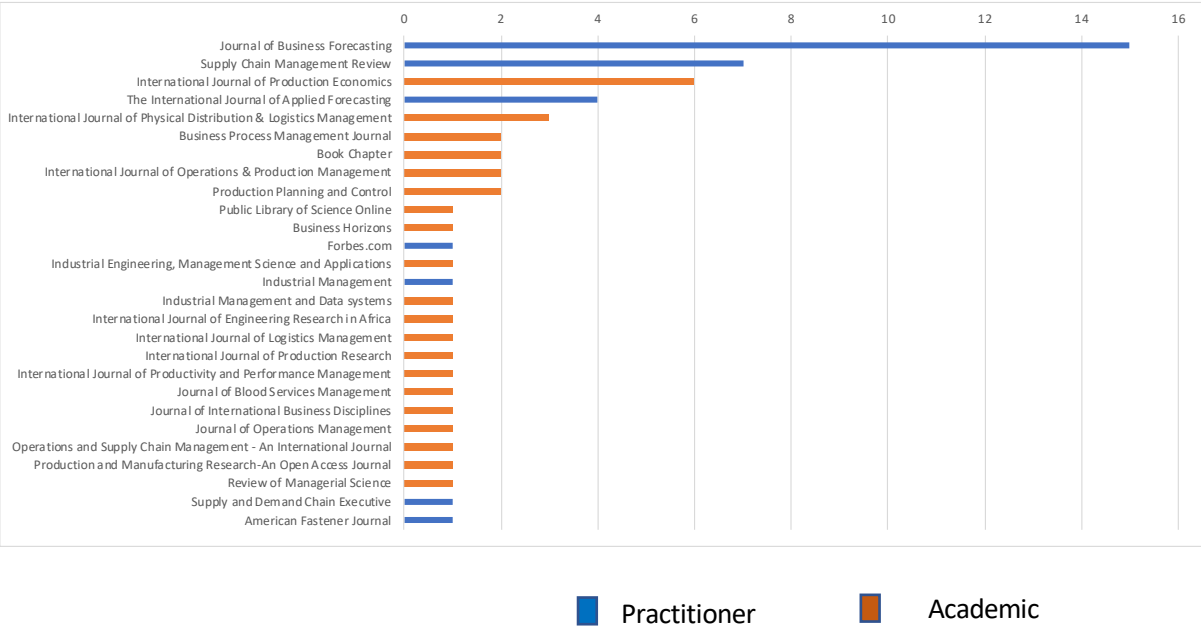


Figure 2. 3: Source profile of articles (N=61)

As shown in Figure 2.3, while there is a broad spread of academic publications who have published articles that inform the 'SA in S&OP' research topic, the quantity is very sparce with typically only one article per publication.

2.3.2 Data Analysis

In order to effectively analyse the data based on the research objectives, the data was ordered, categorised and coded to support the interpretation of potential themes (Whittemore and Knafl, 2005). To achieve this, all results from the initial search were logged to a database with all the relevant reference information recorded. The information recorded for each source is shown in Figure 2.4.

Title	Author(s)	Publication	Publication Category	Publication Year
Title of publication	Names of author or authors	Name of journal / book where published	Academic or Practitioner	Year of publication

Database Source(s)	Strategic Alignment Relevance in S&OP (Y/N)	Primary focus of paper on "Horizontal" or "Vertical" or "Both"	Call for Action on Strategic Alignment (Y/N)	Summary Context of Publication
Of the databases searched where was publication sourced from	Publication is relevant to the research objective ?	Of the S&OP definition, what was the primary focus of publication	Was there a call for action on Strategic Alignment ?	Brief summary by researcher on the context of the publication

Figure 2. 4: Database recording of key information from sources

This structure facilitated the systematic comparison and integration of categories related to the research objective (Whittemore and Knafl, 2005). Following Snyder (2019) the literature reviews or full descriptive synthesis, as would be expected in a SLR, were not conducted. Rather this review focused on synthesising the literature in an integrative manner to illuminate new knowledge (Snyder, 2019, Torraco, 2016, Whittemore, 2005) and avoid *"a paragraph-by-paragraph tour of one article after another"* (Callaghan, 2010, p.303).

In support of the research objective, to understand what factors support the enablement of 'SA in S&OP', when evaluating the data, both *descriptive* and *causation* coding was adopted (Saldana, 2013). As such any indications from the literature that pointed to explanations or approaches to enable 'SA in S&OP' were coded in the database. Using a combination of quantitative techniques (assessing the number of occurrences that data extracts were assigned to a particular code) and qualitative techniques (assessing whether data assigned to codes were of significance), codes were combined and renamed to focus on the key findings. After multiple iterations of cycling between the codes and the data sources, a set of first order codes were settled on, resulting in seventeen codes. Further analysis identified relationships between specific codes (axial coding) supporting the extraction of eight themes (Williams and Moser, 2019). With the objective of creating a research agenda platform for further

research, the themes were identified from the *"explicit and surface aspect"* (Vaismoradi & Snelgrove, p.2) of the coded data, as opposed to seeking to interpret latent content, as would be the case in the thematic analysis approach prescribed by Braun and Clarke (2006). This latter approach would not be appropriate for an integrative literature review where insights were being sought across a range of studies not directly related to the phenomenon under investigation. In line with the QCA approach, this final step of selective coding (Williams and Moser, 2019) resulted in the construction of an initial conceptual framework reflective of the existing body of knowledge contained in the literature, to explain how to go about achieving the phenomenon of 'SA in S&OP'.

2.3.3 Credibility and Trustworthiness

Integrative literature reviews have been criticised in the past for a lack of rigour and the potential of bias (Whittemore and Knafl, 2005). Thus an established ILR process was followed to ensure the research is reproducible (Torraco, 2016). When it comes to qualitative research, most researchers approach their studies with some orienting ideas (Miles and Huberman, 1994). In this case, the orienting ideas of the researcher have been triggered by: (i) academic research papers that have called for attention on the vertical alignment aspects of S&OP for many years, and (ii) the practical experience of the researcher as an S&OP/IBP consultant experiencing first-hand the challenges that organisations have when it comes to achieving strategic alignment, with their S&OP/IBP processes.

The explicit inclusion and exclusion criteria that were deployed enables a transparent approach for any future researcher to reproduce the search results (Whittemore and Knafl, 2005). Through the data analysis phases careful consideration to the role of the researcher remained paramount throughout. Acknowledging the researcher role is important to achieving credibility (Vaismoradi and Snelgrove, 2019). To reduce the risk of bias the coding process was documented and previous iterations were maintained for transparency on the process to come to the final set of codes. In addition, the findings were reviewed among the research team of three. The experience of the researcher in the field was an advantage in assessing potential relationships between the themes and determining the structure of the initial conceptual framework (CF1). Ultimately, as acknowledged by Saldana et al. (2011): *"The bottom line is that credibility and trustworthiness are matters of researcher honesty and integrity"* (Saldana et al., 2011, p.136). Every effort was made to demonstrate this through providing transparency of the steps taken.

2.4 Integrative Literature Review (ILR) Findings

In this section the findings from the synthesis of the literature are presented. While not directly related to the research objective, of understanding how to go about achieving 'SA in S&OP', a number of publications emphasised "why" it was important to achieve 'SA in S&OP'. In support of the merit of the research study, this aspect is summarised initially before the substantive findings related to the research objective are presented.

2.4.1 Why Strategic Alignment (SA) in S&OP is important

Deploying the QCA approach, eight codes related to why strategic alignment in S&OP was important emerged. While not directly related to the research objective, this was an interesting aspect to further justify the merit of the study. The codes assigned, along with the split between academic and practitioner literature sources, are shown in Figure 2.5.

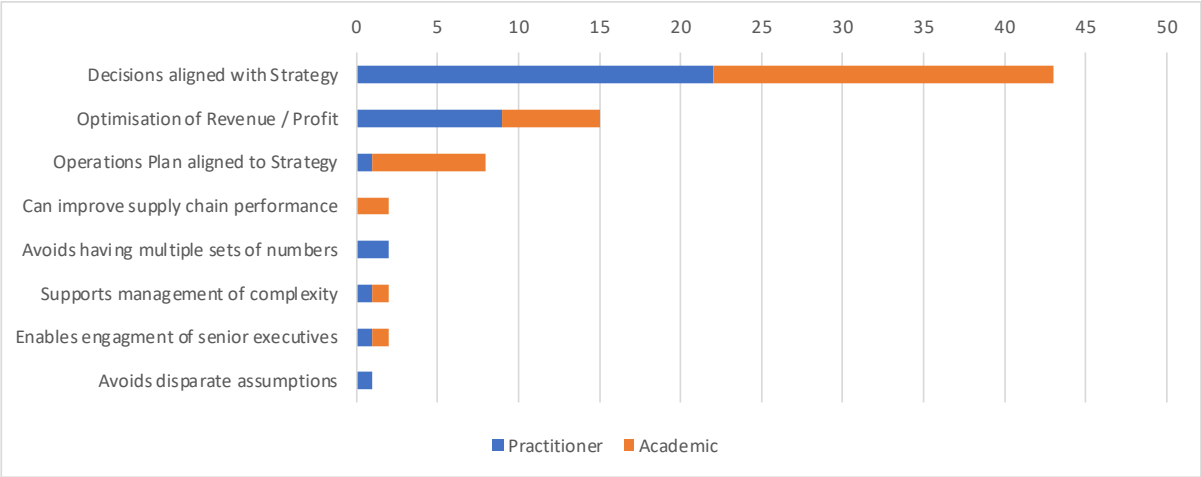


Figure 2. 5: Reason codes for why SA is important (N=61 / Count=75)

Note when multiple reasons were identified in a given article then each one was captured in the count. Hence the count number (Count=75) is higher than the number of publications sampled (N=61). Table 2.3 lists the sources that aligned to each of the coded categories and whether they were academic or practitioner references.

Table 2. 3: Coding of publications that referenced explicitly why SA was important

Coding	Academic Literature	Practitioner Literature
Decisions aligned with strategy	Gianesi (1998), Keal and Hebert (2010), Yurt et al. (2010), Ivert and Jonsson (2010), Thomé et al. (2012a), Thomé et al. (2012b), Ivert and Jonsson (2014), Tuomikangas and Kaipia (2014), Wagner et al. (2014), Tanajura et al. (2015), Hulthén et al. (2016), Naslund and Williamson (2017), Noroozi and Wikner (2017b), Noroozi and Wikner (2017a), Hulthen et al. (2017), Kristensen and Jonsson (2018), Nabil et al. (2018), Danese et al. (2018), Goh and Eldridge (2019), Pereira, Oliveira et al. (2020), Schlegel et al. (2021), Kreuter et al. (2021b), Tchokogué et al. (2022)	Bower (2005), Muzumdar and Fontanella (2006), Gallucci (2008), Tohamy (2008), Baumann (2009), Atkinson (2009), Baumann (2010), Schlegel and Murray (2010), Singh (2010), Lapide (2011), Alexander (2013), Chase (2013), Dougherty and Gray (2013), Cecere (2015), Van Hove (2016), Lapide (2016), Viswanathan (2016), Wilson and Raman (2017), Gray and Dougherty (2017), Montague (2017), Turner (2018), Dunn (2019), Desmet (2022),
Optimisation of Revenue / Profit	Grimson and Pyke (2007), Thomé et al. (2012b), Tuomikangas and Kaipia (2014), Tanajura et al. (2015), Noroozi and Wikner (2017a), Schlegel et al. (2021), Seeling et al. (2022)	Cecere (2005), Bower (2006), Muzumdar and Fontanella (2006), Gallucci (2008), Baumann (2009), Atkinson (2009), Alexander (2013), Cecere (2015), Turner (2018), Millington (2022)
Operations Plan aligned to Strategy	Gianesi (1998), Olhager et al. (2001), Oliva and Watson (2011), Noroozi and Wikner (2016), Kristensen and Jonsson (2018), Pereira et al. (2020), Kreuter et al. (2021b)	Gray and Dougherty (2017), Bower (2022)
Can improve supply chain performance	Alvekrans et al. (2016), Goh and Eldridge (2019), Tchokogué et al. (2022)	
Avoids having multiple sets of numbers		Baumann (2009), Dougherty and Gray (2013)
Supports management of complexity	Ivert and Jonsson (2014)	Schlegel and Murray (2010)
Enables engagement of senior executives	Pereira et al. (2020)	Alexander (2013)
Avoids disparate assumptions		Baumann (2009)

A number of the studies highlighted the need for alignment of decisions made in the S&OP process with the business strategy. Some authors went as far as positioning S&OP as a key enabling process for deploying the strategy through the organisation and ensuring strategic goals were met (Gianesi, 1998; Muzumdar et al., 2006; Baumann, 2010; Schlegel, 2010;

Alexander, 2013; Dougherty and Gray, 2013; Tuomikangas and Kaipia, 2014; Wagner et al., 2014; Lapide, 2016; Naslund and Williamson, 2017; Lahloua et al., 2018; Turner, 2018; Dunn, 2019). While recognising the importance and value of enabling strategic decision making, a number of authors attributed this to S&OP maturity and something organisations should build towards (Keal and Herbert, 2010; Bower, 2005; Ivert and Jonsson, 2014; Gray and Dougherty, 2017; Danese et al., 2018). It is also acknowledged that if SA can be achieved then it allows feedback to the strategy which can result in strategy adjustments, thus keeping the strategy visible in the business (Galluci, 2008; Yurt et al., 2010; Noroozi and Wikner ,2017a; Noroozi and Wikner, 2017b). Hulthen et al., (2016 & 2017) stress the importance of SA and include process measures in their framework to check for the effectiveness of S&OP on the corporate goals.

The role of 'SA in S&OP' to ensure the optimisation of revenue and/or profit for the business is evident across a range of studies. The authors who emphasise this aspect pay particular attention to the opportunity that S&OP brings to drive a growth mindset in the organisation. Alexander (2013) and Turner (2018) argue that one of the key reasons that there has not been sufficient focus on the SA aspect of S&OP is that it has been developed by supply chain professionals and as such it is driven by a *"control"* mindset. They purport that to achieve the full potential of S&OP the organisation need to approach it with a *"growth"* mindset. Similarly Bower (2006) focuses on the importance of SA to ensure that the management of the product portfolio can be integrated into the S&OP process. Likewise, the findings from a survey presented by Cecere (2015) confirms the value of moving beyond demand/supply balancing to a focus on growth. Continuing with the theme of growth in revenue and/or profit, other authors advocate for 'SA in S&OP' to ensure full engagement of the commercial organisation and to recognise the opportunities to shape demand to meet the strategic targets (Cecere, 2005, Galluci, 2008, Tuomikangas and Kaipia, 2014, Noroozi and Wikner, 2017a).

When it comes to supply chain a particular focus is on the importance of manufacturing strategy alignment. Olhager (2001) for example expressed the importance of SA to ensure optimum manufacturing strategies are executed based on strategic intent and product profile, resulting in lead or lag approaches in Make-To-Stock (MTS) and Make-To-Order (MTO) environments. Similar discussions were put forward by Noroozi and Wikner (2016), Gray and Dougherty (2017) and Kristensen and Jonsson (2018). When studying decision models within S&OP, Pereira et al. (2020) expressed the importance of SA to ensure that supply

chain planning received clear direction from the business strategy, but did not discuss the implications of any feedback to the strategy.

Supply chain performance has been linked to 'SA in S&OP', for example Goh and Eldridge (2019), supported by extensive survey data analysis, concluded that *"strategic alignment is positively related to supply chain performance"* (Goh and Eldridge, 2019, p.84). This hypothesis supports an earlier assertion by Alvekrans et al., (2016), who put forward that SA was key to support the optimum allocation of resources across the supply chain.

Baumann (2009) and Dougherty and Gray (2013) advocate for 'SA in S&OP' to avoid multiple sets of numbers in the business, in particular to avoid finance running their own plans and projections, independent of the S&OP plans.

Schlegel and Murray (2010), while anticipating the benefits of the growing capabilities in predictive analytics and digital modelling, advocate that SA is essential in S&OP. They position the need for analytics in order to build a capability to respond to a business environment that has growing levels of uncertainty, complexity and risk. Similarly, Ivert and Jonsson (2014) advocate the need for advanced planning systems to deliver a more mature S&OP capability that will enable SA.

SA was also considered critical to executive engagement in S&OP (Alexander, 2013). Without this strategic focus in the S&OP process, Alexander (2013) argues that executives will lose interest in the process. This is further emphasised by Pereira et al. (2020) who argue that whomever has responsibility for the strategic function in the business, should be directly involved in the S&OP activities, in order to ensure SA is achieved.

A practical consideration as to why SA is important in S&OP is put forward by Baumann (2009) when he proposes that there is a risk of disparate assumptions underpinning the future plans if the S&OP process is not managed in a fully integrated fashion.

What was found from the analysis shows that in support of the problem statement presented in Chapter 1, there are many business benefits as to why organisations should be focused on achieving 'SA in S&OP'.

The remainder of this section focuses on findings directly related to explaining the factors that support enabling 'SA in S&OP'.

2.4.2 Factors that support achieving Strategic Alignment (SA) in S&OP

Through the analysis of the data, coded through the ILR process, a set of seventeen first order codes led to the identification of eight higher order themes.

In the following sections, each theme is expanded to describe the contributions from the selected publications, as it relates to factors to enable 'SA in S&OP'. For each theme a diagram representation is included of the coding and examples of supporting evidence from the associated references (Figure 2.6 – Figure 2.13). The colours in the figures represent the source of the contributions in terms of academic (orange colour) versus practitioner (blue colour).

As shown in Figure 2.6 though Figure 2.13, there is a close split between academic sources (twenty four articles) versus practitioner (twenty seven articles). However, in terms of the contributions that were coded in support of the themes, the practitioner literature contributed nearly twice as many (78 contributions) as the academic literature (42 contributions). This was not surprising considering that practice is acknowledged as leading academia on the subject of S&OP (Tuomikangas and Kaipia, 2014, Kreuter et al., 2021a).

Theme 1: Executive Education

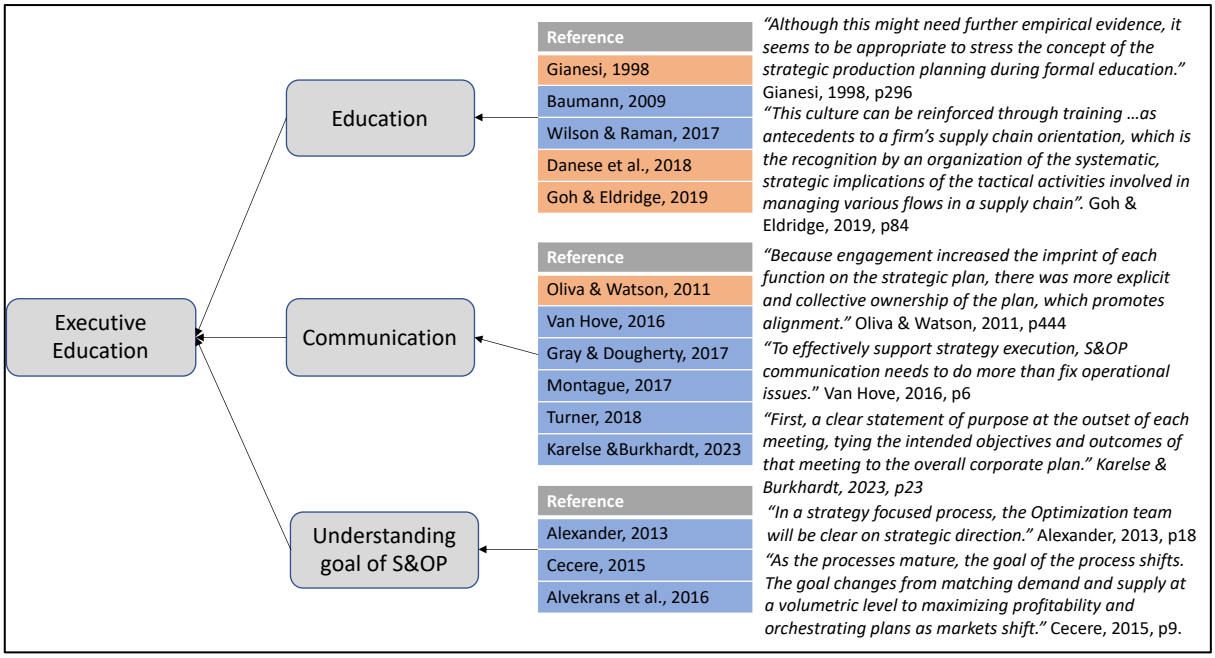


Figure 2. 6: Coding process leading to 'Executive Education' theme

Initial and ongoing education, particularly for senior executives, is a key requirement (Gianesi, 1998, Baumann, 2009, Wilson and Raman, 2017, Danese et al., 2018, Goh and Eldridge, 2019). Beyond education, increased recognition of the importance of 'SA in S&OP' can be achieved through effective engagement and communication (Oliva and Watson, 2011, Van Hove, 2016, Gray and Dougherty, 2017, Turner, 2018, Karelse and Burkhardt, 2023, Montague, 2017).

The ultimate goal of education and engagement is to encourage senior management to appreciate that their S&OP process is the single process used to run the business (Alexander, 2013, Cecere, 2015, Alvekrans et al., 2016). Baumann (2009) indicates that *"Leadership education, total involvement and accountability of senior financial and corporate management in driving integration of S&OP with business management processes"*(p.13) are required.

Theme 2: Process Maturity

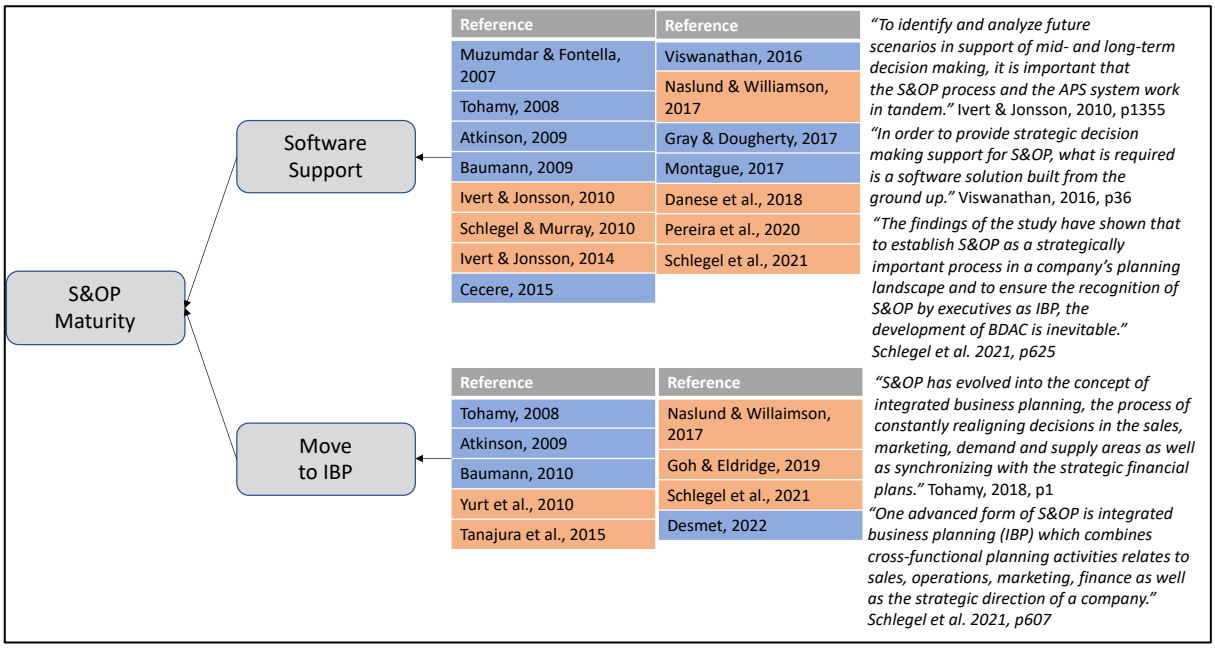


Figure 2. 7: Coding process leading to 'Process Maturity' theme

The level of S&OP maturity has typically been characterised by maturity models. Danese et al. (2018) provided a summary of seven such models from the literature. They created a theoretical framework to investigate the transitions from one maturity level to the next, leading to a five-stage maturity model, based on the Grimson and Pyke (2007) model. They concluded that stage 5 is *"almost utopian"* when companies have a clear "*emphasis on long-term strategic plans to support the company's growth plans"* (Danese et al., 2018, p.2041).

One important enabler of S&OP maturity is the use of software such as Advanced Planning Software (APS) to boost strategic decision visibility and aid strategic decision making (Baumann, 2009, Ivert and Jonsson, 2010, Ivert et al., 2015). Other authors refer to an array of decision support applications (Muzumdar and Fontanella, 2006, Tohamy, 2008, Atkinson, 2009, Schlegel and Murray, 2010, Cecere, 2015, Viswanathan, 2016, Hulthen et al., 2017, Naslund and Williamson, 2017, Gray and Dougherty, 2017, Danese et al., 2018, Pereira et al., 2020, Schlegel et al., 2021, Montague, 2017). The ability to manipulate the large amounts of data required to provide a capability in the organisation to represent decision making scenarios is a key argument for the enabling role of software.

For Schlegel et al. (2021), Big Data Analytics Capabilities (BDAC) is a key requirement for S&OP maturity and for evolving towards Integrated Business Planning (IBP). Some authors even suggest replacing S&OP with IBP at higher levels of maturity, focusing on the role of SA in delivering strategic growth targets (Tohamy, 2008, Atkinson, 2009, Baumann, 2010, Tanajura et al., 2015, Naslund and Williamson, 2017, Schlegel et al., 2021, Desmet, 2022). Based on their survey of S&OP practitioners, Goh and Eldridge (2019) conclude that SA within S&OP is one of the most significant mechanisms to enable superior S&OP outcomes. They recommend a structured process called "*bricolage"* (Goh and Eldridge, 2019, p. 91) to enable dynamic decision making. Highlighting bricolage as a key coordinating mechanism in S&OP, they find organisations react better to changes in the market place and cope with evolving business needs better. Bricolage is a key design construct of IBP and is known as integrated reconciliation in the IBP process (Palmatier and Crum, 2013).

Theme 3: Planning Horizon

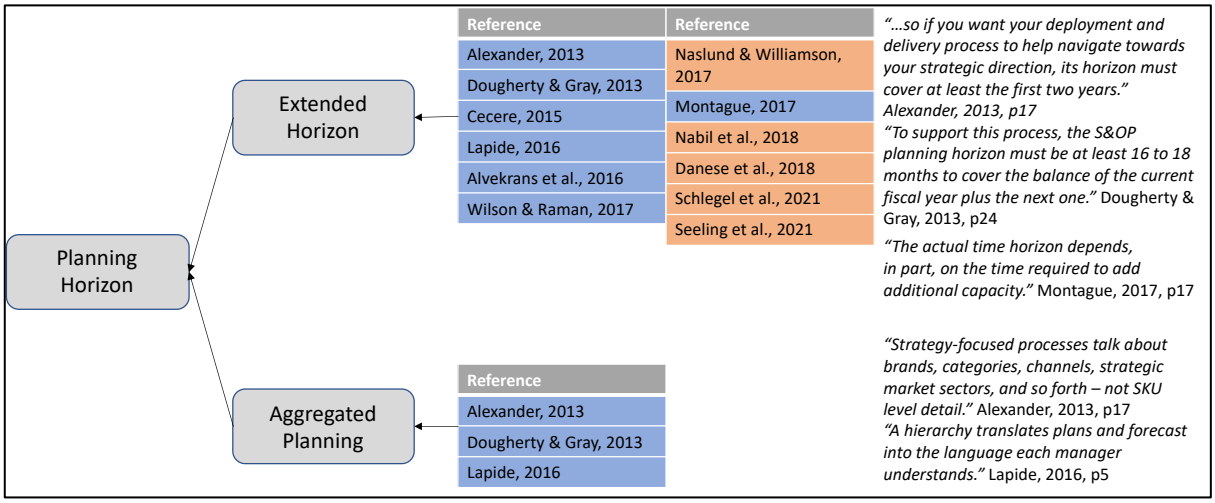


Figure 2. 8: Coding process leading to 'Planning Horizon' theme

Aiming S&OP meeting discussions towards the longer-term horizon emerged as a key contingency factor. How far out companies need to look depends on the types of strategic decisions they need to make (Alvekrans et al., 2016, Schlegel et al., 2021, Montague, 2017), but authors agree that the horizon should extend beyond the current financial year (16-18 months) if the organisation is to engage in longer-term decision making (Alexander, 2013, Dougherty and Gray, 2013, Cecere, 2015, Lapide, 2016, Wilson and Raman, 2017, Naslund and Williamson, 2017, Nabil et al., 2018, Danese et al., 2018, Seeling et al., 2021).

When planning over the longer-term, uncertainty levels increase and the focus should switch from individual Stock Keeping Units (SKUs) to brands, channels and strategic market sectors, at an aggregated level (Alexander, 2013, Dougherty and Gray, 2013, Lapide, 2016).

Theme 4: Business Context

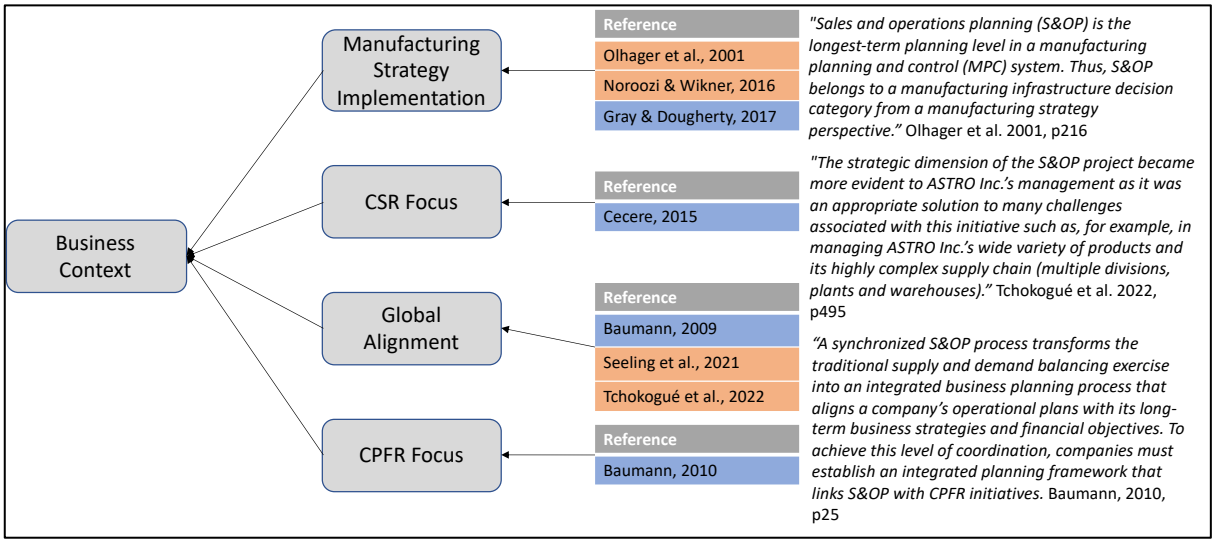


Figure 2. 9: Coding process leading to 'Business Context' theme

Decisions on the type of topics reviewed in S&OP meetings emerged as a key consideration. Some authors focus on the link to the manufacturing strategy and the need to constantly review this in the S&OP process, e.g. to ensure implementation of optimum MTS (Make-To-Stock), MTO (Make-To-Order) or FTO (Finish-To-Order) strategies in a given period of time. Any adjustment to such strategies takes time and needs planning, therefore discussions of this nature in the S&OP meetings help to keep the organisation focused on strategy deployment (Olhager et al., 2001, Noroozi and Wikner, 2016, Gray and Dougherty, 2017).

Baumann (2009) identifies CPFR (Collaborative Planning and Forecast Replenishment) as a means to create close links with customers and therefore strengthen 'SA in S&OP'. Similarly, Cecere (2015) highlights the role of Corporate Social Responsibility in S&OP and the focus this places on SA. She finds that 61% of companies with effective S&OP include CSR in their process. If the scope of S&OP is positioned to achieve global alignment, this can also help organisations to think and plan for the longer-term (Baumann, 2009, Seeling et al., 2021, Tchokogué et al., 2022). While these are specific examples, the conclusion is that the scope of the topics addressed through the S&OP process needs careful consideration and is directly related to the business context.

Theme 5: Product Portfolio Management



Figure 2. 10: Coding process leading to 'Product Portfolio Management' theme

The literature contributions related to Product Portfolio Management (PPM) were very clear in terms of the significance for 'SA in S&OP'. Hence the first order code became the theme. PPM is central to a growth-oriented business strategy (Goh and Eldridge, 2019). Practitioner literature has emphasised its importance for some time (Atkinson, 2009, Alexander, 2013, Dunn, 2019). Bower (2006) suggests that the design of the S&OP process should include a separate step to consider new product introductions, product promotions, SKU rationalisation and product portfolio related decisions. This process step is evident when moving from S&OP to IBP, which encourages a strategic focus (Palmatier and Crum, 2013).

Montague (2017) and Turner (2018) list critical business activities related to product portfolio which do not receive sufficient attention in traditional S&OP implementations. Turner (2018) argues that the S&OP process should include a growth mindset. Other considerations include fostering better alignment with marketing (Chase, 2013), ensuring optimum project prioritisation and allocation of resources (Van Hove, 2016) and ensuring product retirements are planned (Gray and Dougherty, 2017). While there has been less focus within the academic community on the role of product portfolio management in S&OP, Keal and Hebert (2010) consider approaches to S&OP that move beyond balancing supply and demand and include product launches, marketing and sales programmes and resource allocation decisions. Oliva and Watson (2011) similarly call for a structured approach to product portfolio management aligned to the product strategy.

Theme 6: Strategic KPIs

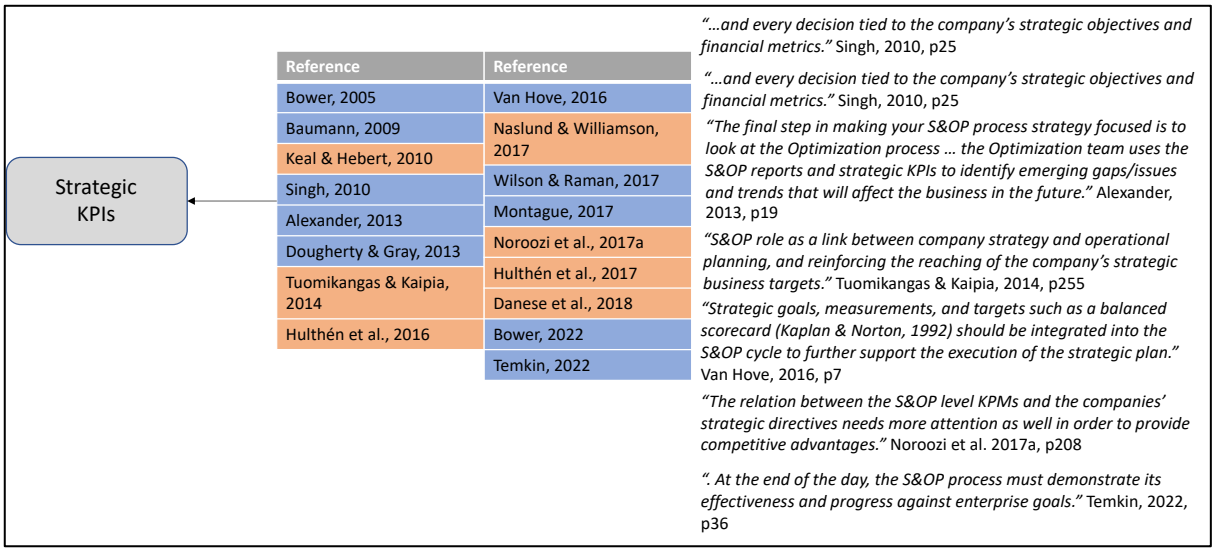


Figure 2. 11: Coding process leading to 'Strategic KPIs' theme

Orienting the organisation around a set of strategic Key Performance indicators (KPIs) was a strong contribution from both the academic and practitioner literature. With KPIs being a key driver of organisation behaviour it was determined that this code was reflective of an important theme. Support for SA can be achieved if the Key Performance Indicators (KPIs) monitored within the S&OP process focus on achieving strategic goals ((Bower (2005), Baumann (2009), Singh (2010), Dougherty and Gray (2013), Tuomikangas and Kaipia (2014), Hulthén et al. (2016), Wilson and Raman (2017), Noroozi and Wikner (2017a), Danese et al. (2018), Bower (2022), Temkin (2022)). If the right KPIs are selected, they can be used to identify issues and emerging trends that will affect the business in the future (Alexander, 2013).

Montague (2017) suggests a range of potential metrics including growth, market share, cost, inventory levels, customer service, return on investment and fill rate. Keal and Hebert (2010) also point to the importance of KPI selection in ensuring SA. Van Hove (2016) concludes that a balanced set of measures is required to ensure alignment with company goals. Hulthen et al. (2017) acknowledge the importance of having strategic measures, especially at higher levels of maturity, but recognise that strategic efficiency measures for S&OP is a specific challenge for organisations because short-term measures often dominate. Similarly Naslund and Williamson (2017) discuss that implementing measures aligned with strategy can be too

difficult for organisations who prefer to focus on easy to measure KPIs whether or not they are relevant.

Theme7: Integrated Business Plan

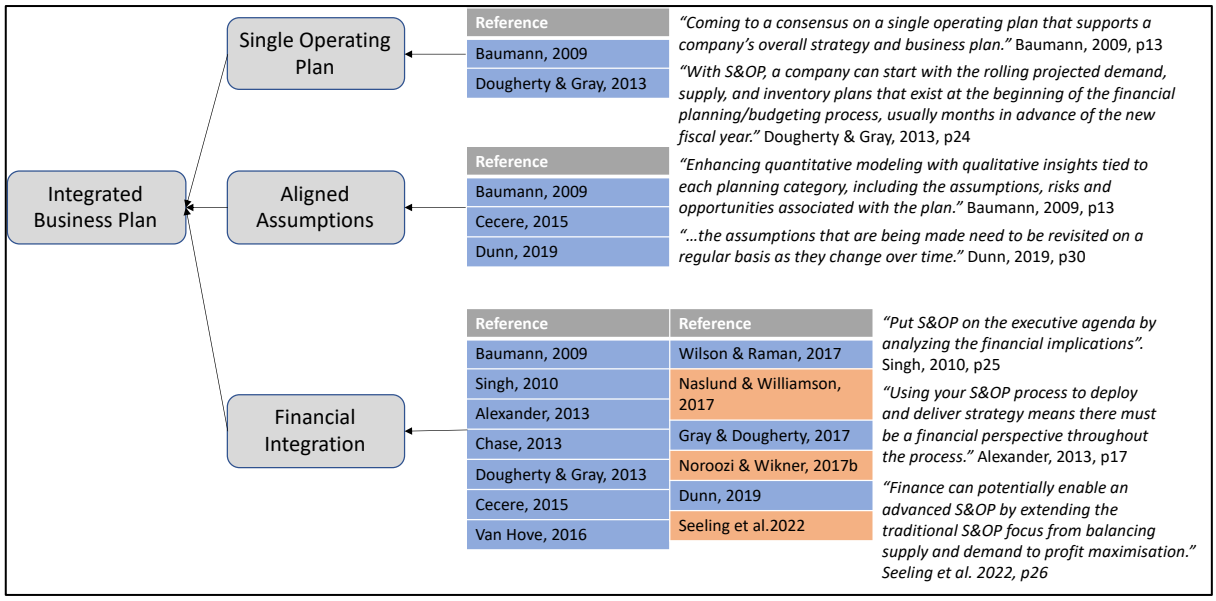


Figure 2. 12: Coding process leading to 'Integrated Business Plan' theme

Having one integrated business plan across functions – i.e. ensuring that the core operating plan supports the strategic plan and the annual business plan (Baumann, 2009) – is considered a key enabler of SA. A true test of this integration within S&OP is when S&OP long-term plans are used for annual budget planning (Dougherty and Gray, 2013). All underlying assumptions, risks and opportunities need alignment between the S&OP plans and strategic plans (Baumann, 2009, Cecere, 2015, Dunn, 2019).

Most importantly, financial plans should be integrated into the S&OP process (Baumann, 2009, Singh, 2010, Alexander, 2013, Chase, 2013, Wilson and Raman, 2017, Naslund and Williamson, 2017, Gray and Dougherty, 2017, Seeling et al., 2022). Many authors focus on the importance of understanding the full financial impact of decisions within S&OP in order to engage the right decision makers and provide a strategic perspective on resource allocations (Baumann, 2009, Van Hove, 2016, Noroozi and Wikner, 2017b, Dunn, 2019). In addition, with full financial integration, S&OP can support freeing up cash for investments through inventory reduction (Dougherty and Gray, 2013) and help companies better focus on

optimising their profits (Cecere, 2015). Dougherty and Gray (2013) even recommend that companies should use the product volumes taken directly from the S&OP plan during the capital request process. Alexander (2013) highlights the importance of having an optimisation process whereby S&OP practitioners maintain constant visibility on the strategic direction of the company and undertake gap closing activities if the S&OP plans are not aligned.

Theme 8: Scenario Planning

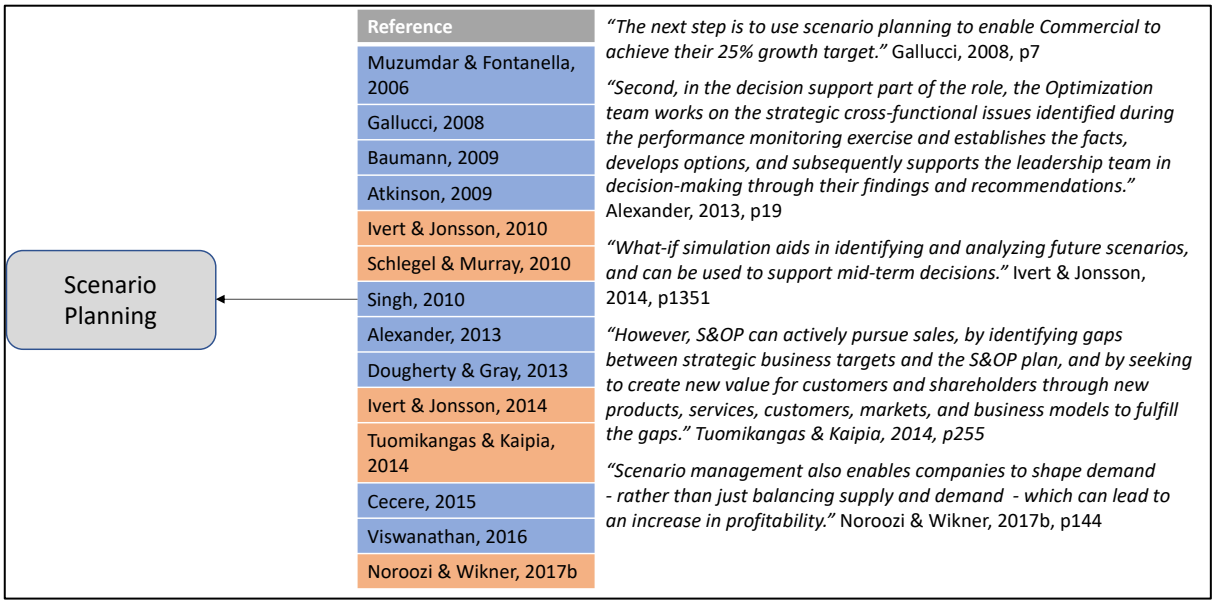


Figure 2. 13: Coding process leading to 'Scenario Planning' theme

The 'scenario planning' code was deemed important enough to be reflected in a theme as it was fundamental in recognising the uncertainty associated with long-term planning and therefore key to 'SA in S&OP'. The use of what-if analysis and scenario planning emerges as a way to handle the inherent nature of uncertainty in strategic planning. Many authors suggest that scenario planning capabilities develop as the process matures and where software support is present (Muzumdar and Fontanella, 2006, Schlegel and Murray, 2010, Ivert and Jonsson, 2010, Ivert and Jonsson, 2014, Viswanathan, 2016).

Scenario planning is particularly useful to optimise decisions on revenue and profitability (Singh, 2010, Noroozi and Wikner, 2017b) and inventory (Dougherty and Gray, 2013). In addition, scenario planning allows organisations ensure that the demand plan is tested against the strategic goals of the business (Gallucci, 2008, Tuomikangas and Kaipia, 2014, Noroozi

and Wikner, 2017b). Overall, scenario planning within S&OP is perceived as a key tool to present alternatives to executives on how to adjust the S&OP plans to align to the strategic direction (Baumann, 2009, Atkinson, 2009, Alexander, 2013, Cecere, 2015).

2.5 Discussion

In this section the emergence of a conceptual framework is described in terms of the identified relationships between the themes. A separate section positions the role of IT as an area requiring further investigation.

2.5.1 Conceptual Framework

The final iteration of the process of developing the themes arising from the review of the literature (Williams and Moser, 2019; Whittemore and Knafl, 2005) involved a general analysis of all the themes to structure a conceptual framework for 'SA in S&OP'. This entailed a process of selective coding (Williams and Moser, 2019) as referred to in the methodology. This allowed the aggregation of all the evidence supporting the coding and themes and the identification of the relationships between themes, as well as the underlying intent, when highlighting SA conceptual framework constructs. The outcome is the conceptual framework (CF1) as shown in Figure 2.14.

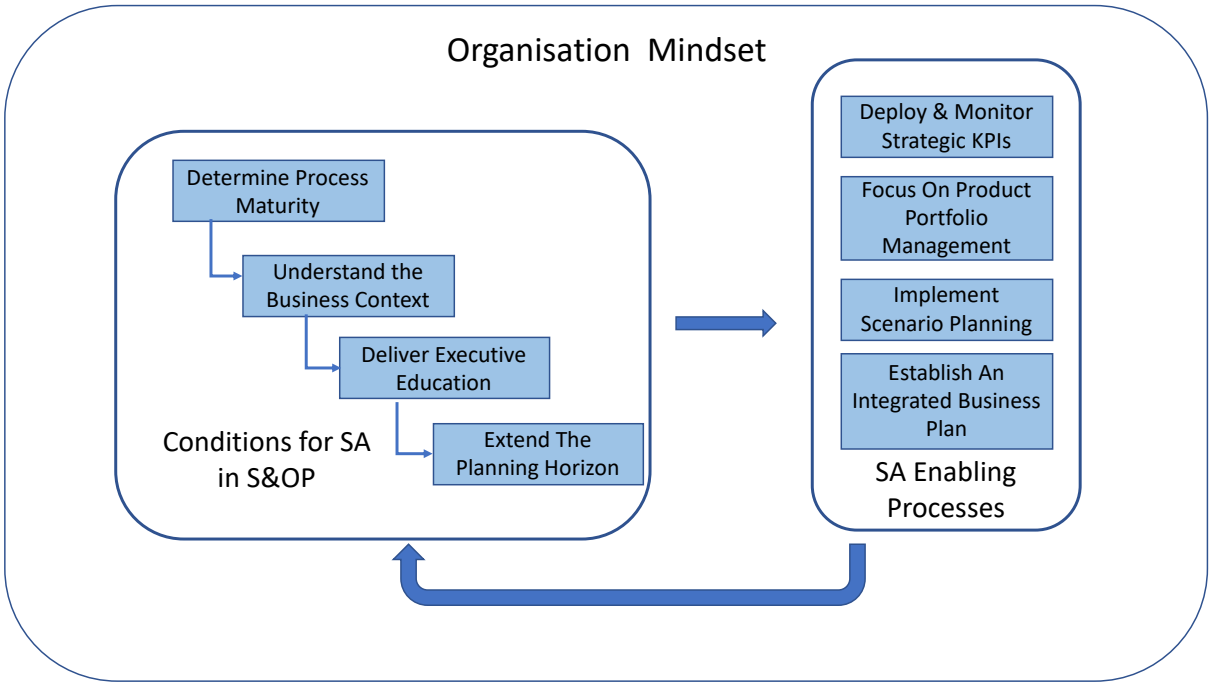


Figure 2. 14: Conceptual Framework (CF1) for achieving 'SA in S&OP'

Figure 2.14 shows that the themes arising from the coding of the literature can be classified in two categories. The first category is formed of four sequential conditions that organisations must fulfil when positioning for 'SA in S&OP'. The second category comprises the four remaining themes which can be characterised as enabling processes for the achievement of 'SA in S&OP'. The feedback loop acknowledges that if there are challenges with triggering SA, some or all of the conditions may need to be reinforced. The elements of the conceptual framework collectively support the building of an organisational mindset that orients the organisation towards 'SA in S&OP'.

As outlined in the literature, achieving 'SA in S&OP' is something to strive for as the process matures over time (Danese et al., 2018). Therefore understanding the current level of maturity of the organisation's planning process is a key starting point in appreciating the opportunity for SA. The specific business context also needs to be understood as this will make clear the type of strategic discussions that need triggering in the S&OP meetings (Baumann, 2009). Understanding the level of maturity and business context are key inputs to the construct of executive education with specific emphasis on *"why"* SA is important. Gianesi (1998), on the basis of case study research, describes this aspect as being a fundamental element of an *"educational phase"* before implementation. With an appreciation of why SA is important 'extend(ing) the planning horizon' becomes fundamentally obvious to the organisation. Based on existing literature, this planning horizon needs to be at least 18 months (Alexander, 2013, Dougherty and Gray, 2013, Cecere, 2005).

The 'organisation mindset' is something that is inherent in all the themes that emerged for 'SA in S&OP'. Tuomikangas and Kaipia (2014) speak to having a *"common culture"* oriented towards *"empowerment and motivation of employees"* (p.251). Fundamental to the organisation mindset is the recognition of planning over a longer-term horizon (Seeling et al., 2021). Once the organisation is oriented to operate the S&OP process in this horizon, then the *growth* mindset referred to by Turner (2018) starts to become visible, strategic measures get positioned to enable strategic alignment decisions (Hulthen et al, 2016), and a focus on Product Portfolio Management (Alexander, 2013) becomes essential. Recognising the uncertainty that comes from planning the future, then leveraging assumptions, risks and opportunities and scenarios are key processes to support the mindset for triggering longer-term planning decisions (Tuomikangas and Kaipia, 2014). Certainly to achieve the commitment to S&OP that can deliver an integrated business plan, with full financial

integration in particular (Dougherty and Gray, 2013), requires an organisation mindset that has shifted away from just the "horizontal" alignment of S&OP to balance supply with demand, to one where the "vertical" alignment with strategy is understood as fundamental to achieving the business strategic goals. This affords the organisation the opportunity to bring forward key strategic decisions to optimise revenue and profit along with the other benefits associated with *why* SA is important, as outlined earlier. Without this alignment such decisions may not be visible within the S&OP process (Alexander, 2013).

The development of the constructs that make up the conceptual framework, coming from the integrative review of the literature, ensured that each construct was detailed to the extent of providing conceptual and operational meaning (Mnguni, 2021), in support of the next phase of the research.

2.5.2 The role of IT

The examination of the literature positioned the role of IT as a process maturity consideration when it comes to enabling 'SA in S&OP'. Hence, it was incorporated as part of the 'Determine Process Maturity' condition in the Conceptual Framework (CF1). While the literature was clear on the role of Enterprise Resource Planning (ERP) systems as the core planning system for balancing supply with demand (horizontal alignment), when it came to enabling long-term strategic decisions (vertical alignment), filed survey data indicated that spreadsheets and charts were the most prevalent tool (Naslund and Williamson, 2017). In order to support scenario planning, Ivert and Jonsson (2010) had stressed the need for having an Advanced Planning System (APS) in place that was fully aligned to the S&OP process. However, according to Viswanathan (2016), one of the key issues with providing support for strategic decision making in S&OP was due to IT providers trying to extend capability from their ERP transaction oriented systems, as opposed to building software solutions from the ground up. Such solutions should be fully aligned to the differing requirements to achieve strategic alignment and support the related decision making. In more recent years solution providers have done just that, with the emergence of solutions from companies like Kinaxis and Anaplan. However, experience shows that while such systems can help with the efficiency of the process, through ensuring standardised display templates are automatically populated, they have not been a significant enabler to achieving 'SA in S&OP'. In a relatively recent study by Schlegel et al. (2021), they argue that building Big Data Analytics Capabilities (BDAC) into the S&OP IT solutions, is critical in order to establish S&OP as a strategically important process.

To this point in the research the literature review has supported the premise made earlier that the role of IT in S&OP is well established through ERP solutions supporting supply and demand balancing. However, as it relates to 'SA in S&OP', it is not yet clear how much of an enabling role it plays thus far. However there is an expectation that with the exceptional growth in IT capability, and data analytics in particular, that it is likely to play a bigger role going forward. With the next stage of the research journey engaging with a group of field experts, the role of IT was explored further to determine what is being experienced in practice (see Chapter 4, Delphi Study and supporting data analysis in appendix 4.10).

2.6 Conclusions

In terms of the objective of this study to understand the factors and approach to achieving 'SA in S&OP', the ILR brought forward a conceptual framework that reflects the findings from the literature to date for this important topic. In order to structure this framework, it was essential to include the practitioner literature, in particular as there have been no substantive studies into 'SA in S&OP' from the academic community to date. Therefore, it was recognised that this framework needed testing in the field through empirical studies for completeness, accuracy and further investigate the relationships between the themes. In terms of the research agenda supporting the next stage of research, a number of specific propositions and associated research questions can be interpreted from the conceptual framework. These are listed in Table 2.4.

Table 2. 4: Research Agenda for Empirical Study of 'SA in S&OP'

Propositions	**Research Questions**
1. To achieve 'SA in S&OP' the following conditions are required and in the following sequence: Determine process maturity -> Understand the business context -> Deliver executive education -> Extend the planning horizon	1(a): Which, if not all, of the conditions are important for 'SA in S&OP'? 1(b): Does the proposed sequence of the conditions hold in practice or do other sequences emerge? 1(c): What other conditions are important for 'SA in S&OP'?

2. The following processes are fundamental to implementing ‘SA in S&OP’: Deploy and monitor strategic KPIs / Focus on product portfolio management / Implement scenario planning / Establish an integrated business plan	2(a): Which, if not all, of the SA processes are valid to achieve ‘SA in S&OP’? 2(b) What other processes should be included to achieve ‘SA in S&OP’? 2(c) What, if any, is a logical sequence to implementing the SA enabling processes?
3. The introduction of an iterative process with closed loop feedback from the SA processes to the conditions, supports embedding ‘SA in S&OP’.	3(a): How important and why is it important to have a closed loop feedback process from the SA enabling processes back to the conditions for SA?
4. The collective conditions and enabling processes, setup in a closed loop feedback manner, are key to achieving an engaged organisation mindset for achieving ‘SA in S&OP’.	4(a): How and why is it important to have a closed loop process to deliver the right organisation mindset for ‘SA in S&OP’? 4(b): What, if any, other elements should be considered when building the right organisation mindset for ‘SA in S&OP’?

An expectation from a structured approach to field research, guided by this research agenda, would be that other areas of consideration would likely become evident to enhance the conceptual framework. Some areas that were subsumed as part of the overall themes may emerge as themes of their own. A conceptual framework bolstered by field research would support addressing the gap in the academic literature while also providing guidance to practitioners on how to extract the maximum value from their S&OP processes. The conceptual framework, propositions and associated research questions arise from analysis of the published body of knowledge. Collectively they provide a basis to conduct field research compiling empirical data to support, challenge or enhance the conceptual framework.

2.7 Summary

The Integrative Literature Review (ILR) enabled a review of the existing academic and practitioner literature to extract contributions in support of the research objective, even though there have been no research studies to date to investigate the specific topic of 'SA in S&OP'. The insights encapsulated in the Conceptual Framework (CF1) enabled a research agenda to be defined including specific Research Propositions (RPs) and associated Research Questions (RQs). This provided a platform for further research including empirical research in the field. The next chapter describes the methods used for the field research and the reasons why the methods were chosen.

CHAPTER 3: RESEARCH METHODOLOGY

3.0 Introduction

This chapter introduces the research philosophy of critical realism that guided the approach to the research. In addition the methods deployed when conducting empirical research in the field are described. This was achieved at two separate stages of the research using:

1. Delphi Study
2. Case Study

Both of these methods are explained including why they were appropriate when addressing the overall research question and in support of the research journey.

The field research was an essential part of the research journey to ensure the evolving conceptual framework was informed by the latest practices in the field. This approach was effective when researching the phenomenon of 'SA in S&OP' as it had not been studied in depth by the academic community to date (Kristensen and Jonsson, 2018, Kreuter et al., 2021b), but has been identified as important and yet challenging to implement in practice (Alexander, 2013, Turner, 2018). Therefore, it was recognised that in the absence of existing studies, the field research aspects would be a significant contribution of the study. This was also the reason for including practitioner as well as academic literature when conducting the Integrative Literature Review (ILR), as outlined in Chapter 2.

The ILR method has been covered previously in Chapter 2. In this chapter the rationale for the overall research philosophy that was deployed is explained (Section 3.1). The specific field research methods that were engaged are described in the next two sections, with attention to the Delphi method (Section 3.2), followed by the Case Study method (Section 3.3).

3.1 Research Philosophy

Guidance for deciding the appropriate research philosophy was provided by the research objective. As outlined in Chapter 1 (Introduction) the research objective was to build an understanding of the factors and approaches for organisations to achieve Strategic Alignment (SA) in their Sales & Operations Planning (S&OP) process.

In considering an appropriate research philosophy to address the research objective, it is important to consider the assumptions associated with: i) the realities of the environment researched (ontological), ii) the nature of knowledge (epistemological) and iii) the researchers own values (axiological) - Saunders et al. (2016). An understanding of the assumptions will in turn inform the appropriate methods.

Five research philosophies, as outlined by Saunders et al. (2016), were considered:

⇒ Positivism: *"Relates to the philosophical stance of the natural scientist and entails working with an observable social reality to produce law-like generalisation".*

⇒ Critical Realism: *"Focuses on explaining what we see and experience, in terms of the underlying structures of reality that shape the observable events"*.

⇒ Interpretivism: *"Emphasises that humans are different from physical phenomena because they create meanings"*.

⇒ Postmodernism: *"Emphasises the role of language and of power relations, seeking to question accepted ways of thinking and give voice to alternative marginalised views"*.

⇒ Pragmatism: *"Asserts that concepts are only relevant where they support action"*.

- Saunders et al. (2016, pp.144-151)

To address the research objective in this research, *Critical Realism* was identified as an effective research philosophy. The S&OP process in a given business is owned and run by the human resources within the business. When it comes to the "*human sciences"* Bhaskar (2011) proclaims that *"critical realism is immediately liberating"* and *"where positivism's instrumentalist-predictive-manipulative approach to phenomena is completely out of place"* (p.141). Similarly Clarke (2008) states: *"The strengths of critical realism for qualitative research lie in its desire to render complexity intelligible, its explanatory focus, its reconciliation of agency and structural factors, and its ability to recognize the existence of wide knowledge while respecting the importance of social meaning to humans"* (p.168).

When considering the nature of reality in this social context, it is essential to delve beyond the perceived reality. Building on the work of Roy Bhaskar, Saunders et al. (2016) explains how the critical realism research philosophy requires the researcher to work through layers of understanding to understand the nature of reality. They call this the *"critical realist stratified ontology"* (Saunders et al., 2016, p.148). The first layer is *"The Empirical"* which is what the researcher observes and experiences. Going deeper "*The Actual"* layer are the events and non-events generated by *"The Real"*, which is the final layer where causal structures and

mechanisms are concluded. This search for causation is central in supporting researchers to explain social events (Fletcher, 2017). Through embracing the *critical realist stratified ontology,* the researcher was motivated to look beyond the ontological structure of the S&OP/IBP process (namely the monthly review meetings, attendees, data files presented). In particular by having the opportunity to directly observe the reviews during the case study and follow-up interviews with key attendees, the researcher sought to discover the key causal relationships that were forming the actual reality, sitting behind the empirical observations.

When building knowledge related to the phenomenon that is 'SA in S&OP' the researcher has to be conscious that the facts can be social constructions. With the researcher coming to the research with over twenty five years' experience in the S&OP field, awareness of potential biases is important and every effort was made to be as objective as possible, while harnessing the experience when it came to analysing the case study observations in particular. The approaches to minimising the risk of bias when conducting the Delphi study and Case Study are described later in this chapter (sections 3.2.4 and 3.3.5 respectively).

The critical realism philosophy incorporated a mixture of deductive and inductive approaches to theory development as the research journey progressed. The iterative focus between theory and practice was triggered by the critical realism philosophy. With no academic studies to date on the phenomenon of 'SA in S&OP' an inductive approach to the literature review was appropriate. The initial conceptual framework (CF1) supported a set of Research Propositions (RPs) and Research Questions (RQs) that enabled a deductive approach to the Delphi field study while being open to new insights based on the extensive experience of the experts (inductive). The application of the theoretical lenses was a deductive approach which presented a framework for case study research that again deployed a deductive approach, albeit with inductive aspects, as new insights came to the fore.

As expected in critical realism, the multi-method qualitative research approach supported the deep analysis required to interpret findings and experiences to uncover the causal relationships involved. In particular when engaging with the field and capturing empirical data, the Delphi Study method and the Case Study method allowed the researcher to be immersed in the social reality of what's involved to achieve 'SA in S&OP' and investigate the associated causal relationships of the elements involved.

3.1.1 Rationale for the Delphi Study

In line with the critical realism research philosophy, the Delphi Study afforded the opportunity for a team of recognised experts to provide their perspectives on the evolving conceptual framework, based on their practical experiences. With survey responses being received anonymously across the respondents, the researcher was tasked with analysing the responses and extracting the key areas where further investigation was required through subsequent rounds, to converge on consensus. An abductive approach was taken when building the next version of the conceptual framework (CF2) with the input from the Integrative Literature Review (ILR) as the starting point (CF1). With the literature review confirming 'SA in S&OP' as a phenomenon not yet studied in depth to date, the abductive approach ensured that while consensus was sought on the efficacy of CF1 in practice, the researcher had to remain open to new aspects or adjustments based on perspectives provided by the expert panel.

The Delphi Method is appropriate for this study, when looking to build theoretical concepts in response to a call for action in academic research for many years (Kristensen and Jonsson, 2018). Combined with the fact that practice has consistently led academic research in the subject of S&OP (Kreuter et al., 2021b), then it is essential that empirical data from the field is extracted in support of building the conceptual framework. Other approaches like the general survey would not have been appropriate as there would be no guarantee that the responses would be from experts. Conducting in depth interviews would have been challenging in terms of carving out a defined space of time when engaging with very senior and busy executives. Also, such interviews run the risk of researcher bias influencing the discussions. A workshop approach bringing the key experts together to interrogate the conceptual framework and provide input would have been virtually impossible logistically, but would also run the risk of dominant speakers shaping the outcome and groupthink (Janis, 1972) impacting on achieving a true consensus. Therefore, the anonymous approach of the Delphi, ensuring all inputs are independently captured, without risk of researcher bias and logistically allowing senior executives to complete their responses in their own time, meant that the Delphi method was both appropriate and indeed the preferred approach for this study.

3.1.2 Rationale for the Case Study

The single case study enabled an in depth analysis and in accordance with the critical realism research philosophy, provided the opportunity to get behind the perceived reality to observe the social constructs and causal relationships.

A case study is appropriate when studying complex phenomena (Yin, 2013) and has *"high validity with practitioners – the ultimate user of research"* (Voss et al., 2002, p.195). The phenomenon in this case is the achievement of 'SA in S&OP' which has been identified as a topic not studied in depth in the academic community to date (Tuomikangas and Kaipia, 2014, Kreuter et al., 2021b) and one that is deemed of significant importance to practitioners but difficult to achieve (Alexander, 2013, Turner, 2018).

The researcher was able to leverage previous consulting experience to recruit an *exemplar* business. With the phenomenon of 'SA in S&OP' being rare, the case study afforded a unique opportunity to build empirical data to a level of granularity that could not have been achieved using other methods (e.g.:- surveys). With the researcher being immersed into the S&OP/IBP process of the case study company, it afforded the opportunity to get beyond the mechanics of the process in terms of structures, data and teams and observe the behaviours, language and team dynamics, when seeking to understand the causal relationships involved.

With the conceptual framework (CF3) having emerged from three structured research steps (ILR, Delphi Study, theoretical lenses), the presence of research propositions drove a predominantly positivist research philosophy, using deductive methods when studying the phenomenon and investigating the causal explanations. However, as 'SA in S&OP' is an emerging topic, the design had to support the potential emergence of new insights and knowledge that could enhance CF3. Hence, an element of inductive research philosophy was also present, where new constructs were uncovered and captured during the study. This abductive approach is recommended for case study research even if it means the research question evolves as new knowledge comes to light (Voss et al., 2002).

3.2 Delphi Study Method

The Delphi method was developed by the Rand Corporation in the 1950's (Skinner et al., 2015) as a technique for future forecasting, through engaging the opinions of independent participants, considered expert in the topic, leading to reliable conclusions (Baker et al., 2006). According to Dalkey and Helmer (1963), *"It attempts to achieve this by a series of*

intensive questionnaires interspersed with controlled opinion feedback". The questionnaires are modified through each iterative round to maximise the extraction of expert knowledge and experience, while migrating towards a consensus perspective on the research topic.

One of the important advantages of the Delphi method over focus groups, is that the participants remain anonymous to each other and therefore cannot be influenced by a potentially dominant expert (Keeney et al., 2001). However, the participants are not anonymous to the researcher in order to allow context specific analysis and follow-up (Keeney et al., 2001). Another advantage is that the participants can take their time to consider their opinion and can complete the questionnaire from wherever they are located in the world (Drumm et al., 2022).

3.2.1 Delphi Experts

The selection of experts for the Delphi study is a crucial aspect to ensure rigour and trustworthiness (Baker et al., 2006). Putting a strong weight on the inputs of a relatively small sample of experts is one of the key differentiators compared to traditional surveys, where a large random sample is required (Keeney et al., 2001). Therefore, ensuring *experts* are *true experts* needs careful analysis. In deciding whether potential participants meet requirements Baker et al., (2006) propose three categories to consider: *Knowledge, Experience, Ability to influence policy*. The first of these, knowledge, relates to education and professional qualifications. Does the expert have the acknowledged professional qualifications that encompass the focus area of research? In terms of experience, the time that an expert has worked in the specific area and the role played, are key determinants. In terms of ability to influence policy, while Baker et al. (2006) were referring to governmental healthcare policies, an interpretation into the corporate world would be whether an expert has the authority to define the business policies, procedures and practices. In justifying the label of *experts* these criteria can provide a framework to guide the selection.

In compiling the expert panel it is recommended that a heterogeneous group of between 10 to 30 is typical depending on the research topic (Skinner et al., 2015). It is feasible to have a homogeneous group but this reduces the sample size and narrows the expert definition (Baker et al., 2006). Therefore, to avail of the opportunity to capture the entire spectrum of opinions, compiling a heterogeneous panel is preferred (Keeney, et al., 2001).

Achieving signup from targeted experts, keeping them engaged and minimising attrition is also a key consideration. In this regard the design of the questionnaire for round one is key. It should engage the interest of the experts if they are going to take the time to respond (Keeney et al., 2001).

3.2.2 Design of Delphi questions

When building new theory in an inductive manner, the researcher is approaching the Delphi study having examined the existing literature and forming appropriate research questions that need investigating. As acknowledged by Miles and Huberman (1994) – *"Any researcher, no matter how unstructured or inductive, comes to fieldwork with some orienting ideas"* (Miles & Huberman, 1994, P. 17). Such ideas can be in the form of a conceptual framework interpreted from the literature, as was the case in this research. In order to get a broad perspective from the expert panel, it is typical that the first round of the Delphi study primarily consists of open ended questions (Mullen, 2003). This approach enables new themes to emerge reflective of the real-life experiences of the experts in the field. These themes can then be subsequently investigated further in the following rounds of the Delphi study. As the rounds progress the drive towards consensus becomes more critical triggering more choice selection type questions, with open questions focusing more on understanding reasons for selection choices.

3.2.3 Achieving Consensus

The expectation of the Delphi method is that the iterations continue until such time as consensus has been achieved (Skinner et al., 2015). Providing feedback and rationale between rounds can help panellists understand the evolving consensus and help make informed decisions in subsequent rounds (Worrell et al., 2013). The detail of the feedback provided is determined by the researcher and is often referred to as 'controlled feedback' (Drumm et al., 2022).

Understanding when consensus has been reached is key to knowing when sufficient iterations have occurred and the study should be concluded. Published studies have shown a range of approaches - some focus on statistical techniques where quantitative data can be assessed. As suggested by Hasson et al. (2000) such techniques can be central tendency and level of dispersion to focus on the significant areas of consensus. Having conducted a systematic

review of Delphi studies, Drumm et al. (2022) found that percent agreement was the most common consensus test deployed with 75% identified as the median threshold to define consensus with a range from 50% to 97%. It was also found that some studies used the non-parametric statistics technique using Kendall's coefficient (W) as explained by Schmidt (1997). To achieve consensus a typical definition would require $W \geq 0.7$.

For qualitative analysis a descriptive coding approach (Saldana, 2013) applied to the respondent narratives, supports an objective assessment of key insights to either further support the quantitative consensus achieved, or trigger topics for further investigation in subsequent rounds.

3.2.4 Integrity of the Delphi Process

To avoid potential criticism and challenges to the Delphi study findings, it is crucial the process demonstrates rigour by carefully considering reliability, validity and trustworthiness, referred to by Hasson and Keeney (2011) as the *"methodological trinity"*. The interactive nature of the process as well as preventing group bias through individual confidential responses is regarded as key to enhancing the reliability of the findings (Clayton, 1997). From a validity perspective, the inputs are provided by experts thus providing valuable empirical data from the 'real world' (Hasson and Keeney, 2011). According to Keeney et al. (2001) so long as it can be demonstrated that these experts represent the knowledge in the area of study, then content validity can be assumed. When it comes to trustworthiness Hasson and Keeney (2011) focus on *credibility, dependability, confirmability* and *transferability.* While the iterative nature of the Delphi method is key to credibility, dependability is achieved through ensuring one has a representative sample of experts. Confirmability is delivered through the transparent analysis of the data obtained and transferability by the verification of applicability of the eventual consensus findings.

By focusing on all of these aspects in the design and implementation of the Delphi method, rigour is achieved. In addition to ensure true consensus is reached, the attrition rate needs monitoring in case the lack of response is due to disagreement that is not expressed (Rowe and Wright, 1999). A response rate of >70% is recommended to ensure rigour (Mullen, 2003).

3.2.5 The Delphi Method as applied in the research study

Over the years the design of the Delphi has taken many forms (see 10 such designs summarised by Hasson and Keeney, 2011, Table 1, p.1697). Based on the aims of this research to obtain expert empirical input to a conceptual framework, interpreted from the literature, then the "*e-Delphi"* methodology was deployed. The e-Delphi is essentially an online version of the *"Classical"* Delphi. As such, experts were carefully selected and screened to ensure they could contribute based on their relevant experience to the study. Candidates were assessed and given a high (H), medium (M) or low (L) rating based on objective criteria as shown in Figure 3.1 and candidate selection then followed the decision criteria as shown.

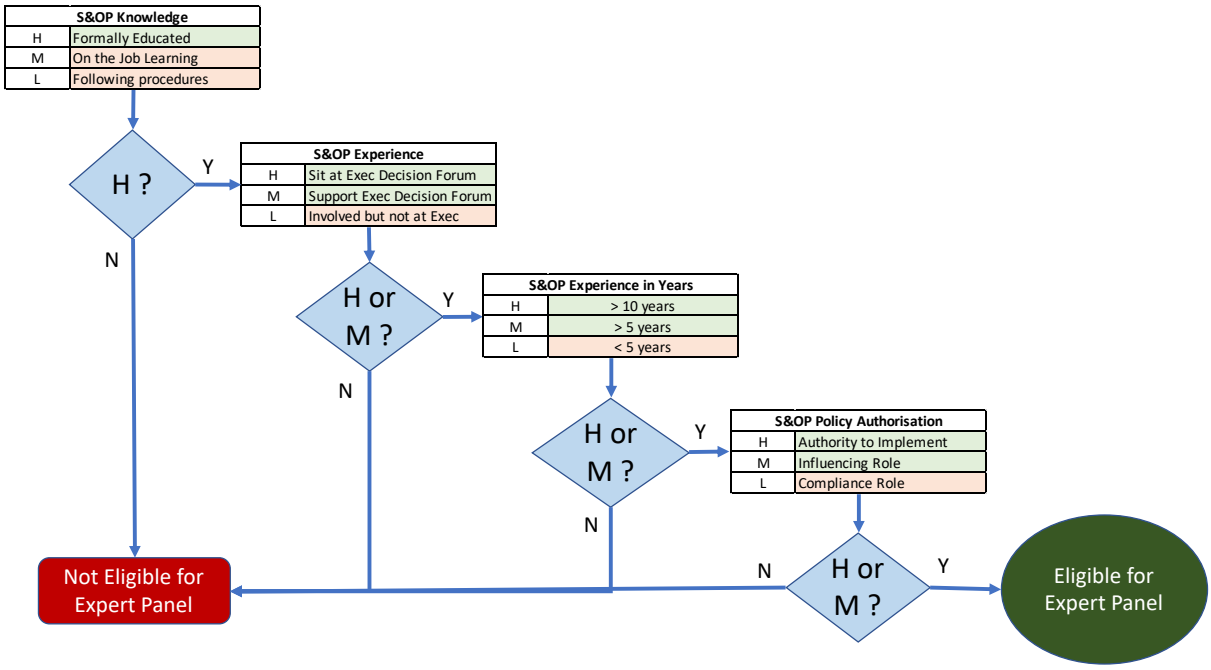


Figure 3. 1: Filter criteria for determining eligibility for expert panel

Recognising that the experts would need to be clear on the full ambition for the S&OP process to appreciate the value of achieving SA, it was considered mandatory to have been formally educated in S&OP/IBP. Examples of formal education packages (Wight, 2017) show that specific emphasis is assigned to achieving Strategic Alignment (SA). The importance of a formal education phase is also suggested by Gianesi (1998). The next filter ensured that to be an expert one would have to be actively involved in terms of supporting or making executive decisions in the process. To ensure sufficient exposure to the process had

been experienced, a minimum of five years direct involvement with the process was required. Finally, experts had to have a role where they had the authority to either influence or implement recommendations coming from the process.

In creating a heterogeneous group of panellists as recommended by Skinner et al. (2015), Figure 3.2 shows the demographic profile of the group of 15 panellists that were selected for the study.

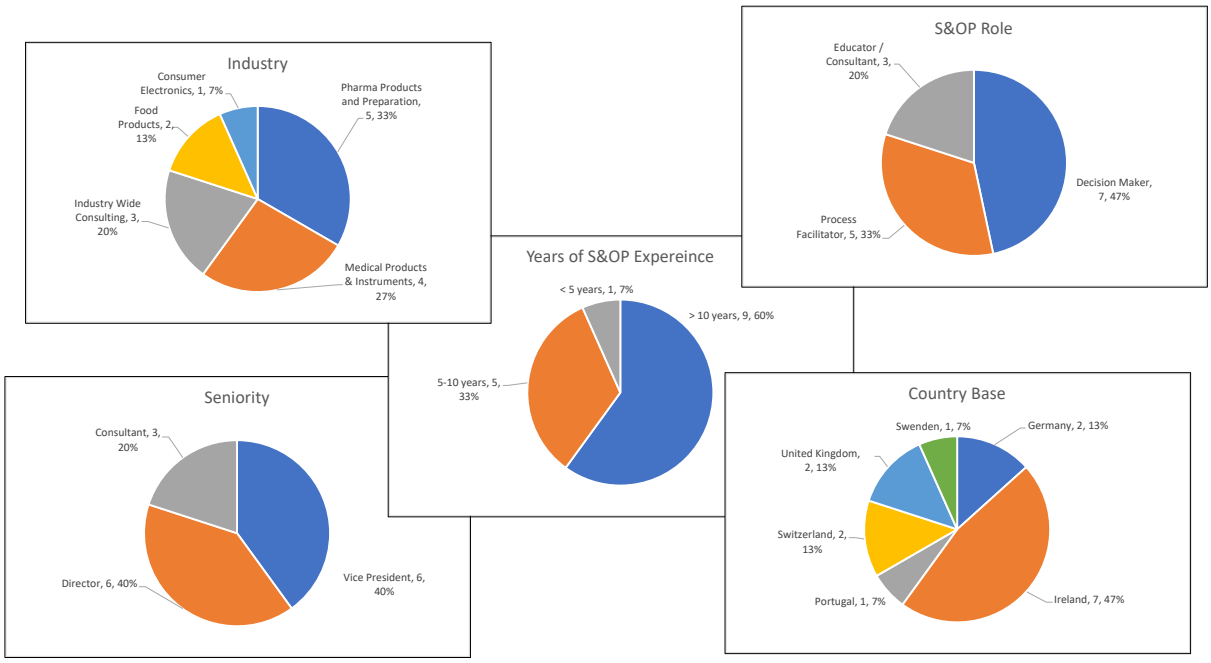


Figure 3. 2: Heterogeneous profile of 15 Panellists

There was one exception where an expert panellist did not meet one of the four selection criteria in terms of having less than 5 years S&OP experience. However, based on the expert being close to 5 years' experience and having recently implemented a global S&OP process, it was deemed that the contribution would be valid and valuable, so an exception was made.

The profile shows a good mix of S&OP roles and levels within their respective organisations. In terms of industry, the expert panellists were sourced from a small group of industry sectors. However, in terms of strategic alignment and enabling strategic decision making in S&OP, the same imperative is triggered, regardless of industry sector. The differences come more in the lead-time associated with strategic decisions. For example Pharmaceutical industry would require longer lead-times than Consumer Electronics manufacturers, for such decisions. This aspect does not affect the focus of the Delphi study which is looking at strategic alignment in support of enabling strategic decision making, regardless of the lead-

time associated with such decisions. Finally, the source location is clearly Western European based, although all of the panellists worked for global corporations with associated global locations.

To optimise the data gathering process, the Qualtrics tool was used for building the surveys and facilitating data capture, for each of the rounds. The tool supported the remote locations of the respondents and allowed initial reports to be constructed quickly to trigger the data analysis phase of each round.

When analysing the data both qualitative and quantitative techniques were used. For round 1 of the study, a number of likert scale type questions enabled a quantitative analysis to determine if consensus of opinion was achieved. In addition a wide range of open questions required a qualitative analysis approach and for this the NVIVO analysis tool was deployed (Bazeley, 2009). While a software tool is not a replacement for deep data analysis, it can make the process more efficient, and provide transparency, if setup correctly from the start using the relevant research methodology construct (Bonello and Meehan, 2019). The descriptive coding approach, as outlined by Saldana (2013), supported objective analysis when summarising the key insights provided by the respondents.

Round 2 and Round 3 of the Delphi became more quantitative in nature, as specific insights were further investigated to see where there was consensus among the expert panel and where further analysis may be required. In this regard the approach to concluding on consensus was based on the percentage agreement (Drumm et al., 2022) with the median threshold of 75% to define consensus and the range from 50% to 97%.

Table 3.1 provides a summary of the key considerations of an effective Delphi and how they were approached in this study.

Table 3. 1: Approaches to maximise effectiveness of Delphi Study

Effective Delphi Consideration	Approach taken in the study
Selection of experts	Structured approach with clear criteria for eligibility
Multiple rounds to achieve consensus	Three rounds deployed to achieve consensus
Anonymity maintained between panellists	Surveys responded to independently with no information

	shared on names or demographics of fellow panellists
Recommend use of a heterogeneous group of between 10 to 30 panellists	Heterogeneous group of 15 panellists engaged for round 1, with 14 of the 15 participating for all three rounds.
Need to have clear criteria for when concluding on consensus	Qualitative and Quantitative techniques used when drawing conclusions from the study.
Ensure achieve < 30% attrition through the process	7% attrition was achieved.
Transparent analysis of the data	Descriptive coding and qualitative analysis approach taken on qualitative inputs and % agreement on quantitative inputs.

The disciplined approach to the Delphi study ensures that rigour was achieved and the results are trustworthy for informing the evolution of the conceptual framework. The trustworthiness of the results is enhanced through following the guidance of Hasson and Keeney (2011). *Credibility* was achieved through the iterative process zoning in on consensus across the expert panel. *Dependability* was assured through having a clearly defined selection criteria to ensure eligibility of the expert panel. On the subject of *transferability*, despite it being a heterogeneous group, the scope of industries involved is still quite limited. However by achieving consensus across a group that included three consultants, with experience across many industry sectors, provided a level of confidence in the transferability of the results.

At the conclusion of the study a report was compiled and sent to the expert panel participants. This was an important step in acknowledgement of the time and expertise that the expert panel had provided (Skinner et al., 2015).

A summary of the overall timeline involved in the Delphi Study is shown in Figure 3.3.

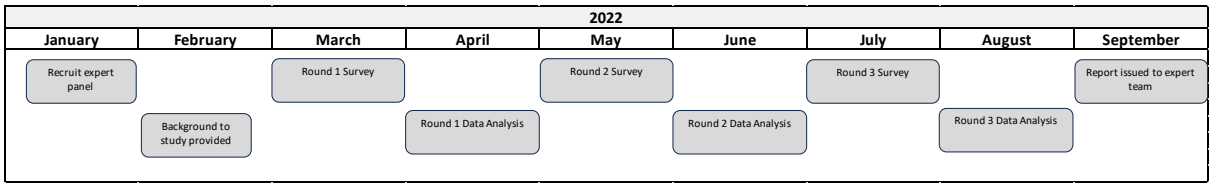


Figure 3. 3: Delphi Study Timeline

The findings from the Delphi Study informed a revision to the conceptual framework (CF2). These findings are presented in Chapter 4.

3.3 Case Study Method

Depending on the research questions, there can be a number of approaches to case study research. Ridder (2017), when considering the theory contribution of case study research, puts forward different design approaches based on the research objectives of theory building, theory development or theory testing. Prominent authors in the case study field have detailed the design approaches. Reviewing the extensive work conducted by Eisenhardt, Dyer and Wilkins (1991) acknowledge the broad contribution by Eisenhardt to case study methods but argue that the emphasis on multiple case comparisons is too restrictive. They argue that the essence of case study research is to obtain in depth knowledge on the phenomenon in question and this can be done most effectively in single case studies. Yin (2009) describes a case study design that has research propositions or frameworks supported by existing theories, which guide the research when gathering and analysing evidence in support of theory development. Stake (1995) puts forward a design to investigate the social construction of reality and meaning when testing existing theories.

The starting point for this case study research was the Conceptual Framework (CF3) and an associated set of Research Propositions (RPs). Therefore, the aim was to seek *"explanatory"* insights as opposed to "*exploratory"* insights (Bass et al., 2018). According to Ridder (2017) this aligns with a *"Gaps and Holes"* case study design to *"develop theory"* (Ridder, 2017): *"In the ''Gaps and Holes'' case study research design, the phenomenon is partially understood. There is a tentative theory and the research strategy is theory driven. Compared to the theory-building phase, the existence and not the development of propositions differentiate this design along the continuum. The prediction comes first, out of an existing theory"* (p.299). This approach differs from the *"No theory first"* approach to *"building theory"* which Ridder (2017) associates with the case study research of Eisenhardt. By starting with the conceptual framework (CF3) the objective was to develop the theoretically based framework further, by explaining the constructs of CF3, through observing the phenomenon in practice. However, the researcher remained open to adding new constructs to the framework should new insights emerge.

When conducting case studies the context is not something that is controlled as in an experiment. The context forms an integral part of the investigation and becomes a key

determinant of how generalisable the results can be (Ridder, 2017). As such the knowledge that is obtained when explaining a particular phenomenon is context-dependent knowledge. For the single case study as much context information as possible was gathered through discussions with the IBP process leaders.

3.3.1 Case Study Design

Given the "theory development" approach to case study design, the prescriptive design outlined by Yin (2009) was followed. The key elements of an effective case study design are listed as:

> *"1. A study's questions*
> *2. Its propositions, if any*
> *3. Its unit(s) of analysis*
> *4. The logic linking the data to the propositions and*
> *5. The criteria for interpreting the findings"* - Yin (2009, p.27)

As is detailed in Chapter 6, the case study was informed by the evolving conceptual framework which by that stage of the research was at revision three (CF3). As a result two research questions and an associated five research propositions, drove the case study design as defined in the research protocol (Appendix 6.1). The focus on observing the actions and behaviours of the S&OP organisation through attending the monthly review meetings, pointed to the S&OP organisation as the appropriate unit of analysis. The data capture process, as described in section 3.3.2 ensured that relevant data related to the research propositions was captured. The interpretation of the data captured followed a structured pattern matching methodology, described in section 3.3.4.

Of fundamental importance to the quality of the outcome from case study research is the selection of the case(s) under investigation. The logic and power of what is called *purposeful sampling* lies in selecting *information-rich* cases for study in depth (Patton, 2002b). According to Patton (2002a) there are 10 purposeful sampling strategies to consider, ranging from the "*extreme or deviant case"* through to *"convenience sampling"*. The specific strategy that is deemed appropriate can also determine whether a single or multiple case approach is required. A single case should afford the opportunity for greater depth but limits the generalisability of conclusions. Multiple cases support validity and guards against

observer bias but requires more resources and may result in less depth per case (Voss et al., 2002).

It is clear from the practitioner literature that organisations continue to struggle to achieve 'SA in S&OP' (Alexander, 2013, Turner, 2018). Therefore, finding case study organisations who could demonstrate 'SA in S&OP' (exemplar cases) and who in turn are willing to be open to engage in the research, is very challenging. Therefore, when such a case is identified, it falls under the *intensity sampling* strategy (Patton, 2002a), also referred to as an *intrinsic* case (Stake, 1995). Patton (2002a) defines intensity sampling as follows:

"Intensity sampling involves the same logic as extreme case sampling, but with less emphasis on the extremes. Using the logic of intensity sampling, one seeks excellent or rich examples of the phenomenon of interest, but not highly unusual cases." (p.234).

Thus, a single case with in depth analysis can be appropriate to support theory development (Voss et al., 2002). In such cases great attention has to be paid to the context, which has a direct influence on the generalisability of the conclusions (Miles and Huberman, 1994).

For this research a single case study approach was adopted as it was important to target an organisation who were considered mature in S&OP and therefore were likely to be running an IBP process (mature S&OP as defined in Chapter 1). Deciding on the Unit of Analysis (UOA) for the study is an important consideration when framing the case study appropriately. As presented by Yin (2009) the main study questions provide the guidance to the appropriate UOA. Based on the case study research questions the UOA was defined as the IBP organisation within the case study business – essentially the team running the monthly process. The monthly IBP process was the focus of the study, observing discussions, analysing the associated data presented and interviewing key people involved in the observed discussions. Evidence related to the conceptual framework constructs was captured when SA discussions or decisions were identified.

3.3.2 Data Capture

A case study offers an opportunity for the collection of large amounts of data. In order to focus on the evidence that is relevant to the case, it is recommended that a *"Case Study Protocol"* is drafted in advance of starting the study (Yin, 2009, p.79). Having a protocol increases the reliability of case study research because it causes the researcher to pause and

plan, in advance of immersing themselves into the case, ensuring the researcher has a clear perspective on what type of evidence to capture and what mechanisms are to be used.

For this case study a research protocol broadly following the format suggested by Yin (2009, p.80) was developed. A full copy of the protocol is shown in Appendix 6.1. The protocol includes a reminder of the case study questions and research propositions that guide the data gathering activities. In case study research a multi-method approach to data collection is typical and supports validity through triangulation (Patton, 2002b). Semi-structured interviews in particular allow the researcher to follow a pre-defined structure aligned to the research purpose but also allow a degree of freedom to capture unforeseen insights that may inform the CF and RPs or other related phenomena to emerge: "*Other sources of data can include personal observation, informal conversations, attendance at meetings and events, surveys administered within the organisation, collection of objective data and review of archival sources."* (Voss et al., 2002, p.204). To support the large amount of data gathered, a computerized database can be a necessary support when it comes to data analysis in particular (Baxter and Jack, 2008, Yin, 2009). With large amounts of data drawn on, it is also critical that a chain of evidence is maintained.

Following the case study protocol guidelines of Yin (2009), the protocol also outlined the approach taken to data evaluation, anticipating potential rival explanations and the expected case study report (see Appendix 6.1).

3.3.3 Data Capture Process Overview

The single case study for this research was a pharmaceutical manufacturer codenamed 'Big Pharma'. A full description of 'BigPharma' is provided as part of the case study Chapter 6 (section 6.1). The case study afforded the opportunity for the researcher to observe three cycles of the Integrated Business Planning (IBP) cycle of 'BigPharma', attending remotely, as a silent observer. The monthly IBP reviews provided the ideal opportunity to observe the collective capability of the team to deliver on the SA ambition for the process. By attending three full cycles the researcher was able to directly observe 24 IBP live review meetings. The logic of three cycles was to ensure that data saturation could be achieved through:

⇒ Cycle 1 observations - getting familiar with terminology and context, identifying where more explanation was needed, and identifying target informants for interviews.

⇒ Cycle 2 observations - building on understanding from interviews conducted, to a lesser degree identifying where more explanation was needed and identifying target informants for interviews.

⇒ Cycle 3 observations – establishing if additional insights emerged relevant to the research propositions and identifying target informants for interviews to close on any outstanding topics.

There were a number of targeted interviews between the cycles, and after the third cycle. These were opportunities to gain specific clarification on questions that arose for the researcher during the review observation session. In addition, the information packs that were presented at each review meeting were made available to the researcher, which supported an understanding of topics discussed and also formed part of the overall data capture and analysis process.

In summary data capture was achieved through:

- Sitting in and observing 24 of the IBP monthly meetings to seek SA type discussions and observe the factors that influence such discussions, as well as the results of such discussions.
- Reviewing the 24 pre-read information packs that accompanied each review meeting. This documentation was a power-point pack that included all the slides that were presented in the review meeting, as well as backup slides.
- Conducting 11 semi-structured interviews to obtain perspective on the factors that enabled specific strategic alignment activities to occur (in the reviews and as part of the preparation).

In advance of observing the first review meeting a listing of all participants was provided to the researcher by the IBP Process Leaders. These names were put into a password protected file and linked with codenames to protect identities. In addition a list of codenames were created for Products, Technology Platforms and Sites. Any writeup of the case study only included the codenames and the only source of reference for matching the codenames real identities was the single password protected file, accessible only by the primary researcher.

To ensure researcher attention was concentrated on observing discussions relevant to the Research Propositions (RPs), structured templates were used for data capture during the IBP review meetings. These templates were built initially as part of the research design and documented as part of the research protocol, with input from the research team. Once the case

study business (codenamed 'BigPharma') had agreed to be the case study, initial meetings were held with the two IBP Process Leaders to obtain contextual information. Through these discussions some final tweaks were made to the data capture template to optimise the capture aligned to the RQs/RPs. The template was critical for efficient data capture, as the researcher would be a non-participatory observer during the review meetings. The final version of the template is shown in Figure 3.4. A set of instructions developed as part of the research protocol were compiled to guide the researcher when filling in the template. These guidelines are shown in Figure 3.5.

SA	SA Capture Category	Description
Specific SA instance observed	*Which of the CF elements were observed?*	*Description of what was observed, including references to people, quotes, documentation*
SA	**Count**	**Summary Narrative**
Discussions	*Record number of instances*	*Summary perspective of the review as it relates to SA in S&OP/IBP*
Missed Discussions		
Decisions		
Missed Decisions		
Total		

Scope	**Product Poirtfolio Management**	**Growth Mindset**
Supporting Evidence	*Supporting Evidence*	*Supporting Evidence*
Education	**Strategic KPIs**	**Feedback Loop**
Supporting Evidence	*Supporting Evidence*	*Supporting Evidence*
Strategic Plan	**Integrated Business Plan**	**Strategic Discussions / Strategic Decision Making**
Supporting Evidence	*Supporting Evidence*	*Supporting Evidence*
Horizon	**Financial Integration**	**Links to Straetgic Plan**
Supporting Evidence	*Supporting Evidence*	*Supporting Evidence*
Maturity	**Scenario Planning**	**Links to Operating Planning and Execution**
Supporting Evidence	*Supporting Evidence*	*Supporting Evidence*

General Observation Comments	**Key Insights Summary**	**Follow-Up Actions**
General observations that may be relveant to analysis	*Specific insights that emerged from the review observed*	*Specific follow-ups to be investigated through the 1:1 interviews*

Figure 3. 4: Data Capture Template when observing review meetings

No.	Step	When?
1	Copy a blank template to create a single file to be used for the specific review meeting.	Before the review
2	Enter in the 'Date', 'IBP Meeting' and 'Vitual / On Site' information into the template (top left corner)	Before the review
3	Colour code the attendees that are present and who contribute plus the ones that were invited but did not attend as per the password protected coding file and ensure all attendees have an assigned annonymised code.	Live during the review
4	When observe activities that relate to the CF then capture in the 'Description' part of the template. Include supporting items (eg:- quotes, source of quotes, review page page no.) as appropriate.	Live during the review
5	In the 'SA Capture Category" column put in a reference to which element of the CF it relates to. If it relates to an element not in the current CF then create a new category.	Live during the review
6	Add in the information related to 'Duration', 'No. Attendees', 'No. Contributors' in the cpature template (top left corner)	Immediately following the review
7	Go back through the capture in the 'Description' column and filter out any observations that are deemed not relavant to the case study research focus.	Immediately following the review
8	Go back through the capture in the 'Description' column and change any names of people, products, platforms, companies to the annonymised codes in the password protected coding file.	Immediately following the review
9	Check the 'SA Capture Coding' reference to confirm it is coded appropriately.	Immediately following the review
10	In the 'SA' column, review the key observations and code any ones that relate to a SA 'Discussion', 'Missed Discussion', 'Decision', 'Missed Decision'.	Immediately following the review
11	Create a sub-total of all SA 'Discussion', 'Missed Discussion', 'Decision', 'Missed Decision', in the capture template (bottom left hand corner).	Immediately following the review
12	Review the key observations as captured in the 'Description' column along with the Review pack of information and by working through each element of the CF in the capture template, enter information that is relevant to that CF element. Once complete, assign a RAG status colour to the CF element, as per the guidelines listed in the 'RAG Guides' tab.	Within 24 hours of the review
13	Capture any general observations of note in the 'General Observation Comments' section of the capture template	Within 24 hours of the review
14	Capture any key insights that want to note in the 'Key Insights Summary' section of the capture template	Within 24 hours of the review
15	List any key actions for follow-up that specifically could be used in support of 1:1 interview planning. Capture these in the 'Follow-Up Actions' section.	Within 24 hours of the review
16	Extract the items labelled as 'Discussion', 'Missed Discussion', 'Decision', 'Missed Decision' and feed them to the 'Profiling SA' tab of the "Data Analysis' file.	Within 48 hours of the review

Figure 3. 5: Guidelines for completing the data capture template for each review meeting.

The concentration while observing the live review meetings was to seek out instances of perceived SA discussions and/or decisions. Immediately following the review meetings, any evidence that aligned to elements of the CF were captured while the context was fresh in the researchers mind. The final elements associated with preparing for the data analysis phase were captured within 24-48 hours of the review meetings. All 24 data capture files were maintained as part of the research database. An example for illustrative purposes is shown in Appendix 6.3.

For each review meeting the researcher concluded a RAG (Red, Amber, Green) traffic light status to indicate the level of evidence associated with each construct of the CF. A set of guidelines provided operational meaning to the various constructs, to support a consistent approach for RAG status assignment. These guidelines are shown in Figure 3.6.

Conceptual Framework	CF Element	Green	Amber	Red
Contextual / Contingent Variables	Education	Clear evidence of being formally educated in IBP including it's core principles of operation (eg:- HR Records).	Use of checklist in the reviews to emphasise the core principles of IBP, including SA aspects. Discussions demonstrate an understaning of IBP core principles.	No evidence that team understand the importance of SA in S&OP/IBP.
	Maturity	Class A certification received for IBP process + IBP principles (as per checklist) evident in the review.	Class A certification received for IBP process + few examples of IBP principles in the review.	No evidence of IBP principles being leveraged in the review.
	Horizon	Data presented in the review over a 24+month horizon.	Some data presented in the review over a 24+ month horizon.	Data presented to cover cuurent budget year or less.
	Scope	Topics on the agenda, presented in the review packs and discussed in the review, cover topics that would be part of the strategic plan.	Some Strategic Plan topics are on the agenda and in the review packs but are not part of the actual discussions in the review.	The agenda, review packs and associated discussions in the review do not relate to the sytartegic plan for the business.
	Strategic Plan	The strategic plan is visible in the reviews either as "top down" targets, product/project roadmaps, key strategic imperatives and/or strategic guidelines for decision making.	The full strategic plan is not visible but key elements are evident in specific areas to drive SA type discussions in the reviews.	There is no evidence of the strategic plan in the review and no evidence of any awareness of it's existance.
Response Variables	Product Portfolio Management	Specific focus in the IBP process on Product Portfolio Management, giving clear visibility of the latest status versus planned changes to the Product Portfolio.	New products and product transfers discussed as part of supply reviews but no specific focus on managing the projects associated with planned changes to the product portfolio.	No specific focus on product portfolio as part of the IBP process.
	Strategic KPIs	Specific performance measures that are focused on the health of the strategic plan. Drives conversations on how to ensure stay on track.	Some measures that drive discussions on longer term performance but not relative to strategic plan. Main sunstantive focus on the the traditional historical measures of performance.	No forward looking performance measures evident from the review.
	Integrated Plan	Clear evidence that all plans are integrated - Product / Projects / Demand / Supply / Financial and all functions integrated across the plans.	Some of the plans are integrated but some disconnects are evident either across the plans or across the functions.	Clear disconnects exist across the plans and functions that are not reconciled through the review discussions.
	Financial Integration	Future projections include the financial performance for the IBP entity. Proposals and scenarios for gap closing clearly show the financial implications to aid decision making.	Some examples of financial projections and/or financial implications from proposals but not consistent in all cases.	Any fincail plans presented appear to be disconnected from the core IBP plans. Financial planning is separate to IBP planning.
	Sceanrio Planning	When gap closing proposals are presented in the reviews, scenarios are included to recognise the uncertainty associated with the future and implications. Key assumptions, risks and opportunities are explicitly called out and discussed in the review. Mechanisms attract knowelge discussions on potential future outcomes.	Some examples of scenarios but other opportunities evident for when scenarios should have been presented but were not. Assumptions, risks and opportunities listed but not appear to be acively reviewed or consistent in how they are applied.	No evidence of sceanrios or use of assumptions and risks and opportunities to drive discussions and bring knowledge to bear on potential future outcomes.
Organisation Mindset	Growth Mindset	Dynamic of review demonstrates trust across the team in terms of not having to challenge the efficacy of what is presented and focus on bringing knowledge and support as a team to address any issues. Roles and responsibilities clearly understood. Strong leadership commitment evidenced through active and positive challenging of the team in the review, by the review Chair (Exec). Discussions support a commitment to achieving the growth strategy for the business.	Good trust evident across most of the functions but some examples of where plans that are presented are challenged in terms of their efficacy rather than discussing the implications. Review chair present but missing opportunities to challenge and lead the team during the review. Some discussions on the longer term growth of the business but mainly focused on shorter term issues.	Team appear to be a group of functions rather than an integrated team. Little or no challnging of plans or team discussions on how best to address gaps in future plans.
Feedback Loop from Response to Contingency variables	Feedback Loop	Evidence that key areas where team are not achieving the expectations of the process are identified in a timely manner and feedback is provided to address and bring them in line with expectations.	Team are timiely in identifying areas where the expectations of the process are not being achieved but the actions to be taken to address any capability deficits are not clear.	Team accept below par performance of the process and do not acknowledge or take any action to address.
Strategic Decision Making	Strategic Decision Making	Decisions are made that have a clear implication to the strategic plan for the business. These decisions should affect the horizon beyond the current budget year.	Longer term (impact beyond budget year) decisions are made but not clear if they have any real impact to the strategic plan (may or may not).	Decisions that are made are focused in the short term (within the current budget year) or are longer term (beyond current budget year) but are clearly disconnected from the strategic plan and do not appear to be influenced by it in any way.
Positioning of S&OP/IBP Process	Link to Strategy Management Process	Clear evidence of awareness of team that decisions made that could impact the startegic plan would need to be captured and fed to the strategic plan review process.	Some examples of awareness of team that decisions made that could impact the startegic plan would need to be captured and fed to the strategic plan review process. However, also some examples of where this link should be made but is not captured as such.	Strategic decisions made but no evidence that will be captured and fed to the Startegy Management process. There des not appear to be a spearate strategic management process to feed to.
	Link to Operations Management Process	The current performance of the operations directly influence the future plans for the business. Discussions in the reviews reflect the focus on ensuring the future plans are realistic based on historical trends.	Historical trends are reviewed and discussed in the reviews but not clear how the connection is made to ensure that future plans are realistic based on the historical trends.	Future plans are generated independent of the current and hitorical perfroamnce of oeprations, resulting in "hopeful" rather than "realistic" plans.

Figure 3. 6: Guidelines for assigning RAG status to CF elements for each review meeting

Central to the CS research was the observation of ‘SA in Action’ during the reviews. As part of the design protocol a separate set of guidelines supported a consistent approach to categorising SA discussions/decisions as well as missed discussions/decisions. These guidelines are shown in Figure 3.7.

Category	What to Observe	Examples of Evidence to Support
Decision	Discussion in the review leads to decision to take action.	CHA or FAC seek consensus from the team as confirmation of the decision made. Confirmation of decision made when do the self assessment at the end of the review.
Discussion	A topic presented in the review leads to a discussion about future gaps between the IBP plan and the strategic expectations.	Discussion generated about gap, prompting inputs on how may have to address it. Actions assigned to investigate the gap further before a formal decision would need to be made. Discussion concludes that no decision needs to be made and sufficient to monitor the gap. Team conclude on decision that needs to be made but have to escalate due to decision rights to a higher forum.
Missed Decision	When data is presented along with request for decision to be made on proposed actions to close a projected gap, but that decision is not made in the timeframe required.	Scenarios presented for decision but no decision is made. Discussion clearly indicates that no decision will mean an impact to delivering against the strategic plan expectations, but no decision is made.
Missed Discussion	Data is presented that indicates a projected gap versus the strategic plan but it does not trigger any discussion in the review.	Data presented that show projected "Red" RAG status but is not discussed in the review. Data presented that show projected "Red" RAG status but discussion focuses on the process (challenging the efficacy of the data) instead of the business (What actions are required to change the "Red' status to "Green").
Notes:		
1	A decision implies that a discussion has occurred leading to a decision but is only recorded once against the decision, not the discussion	
2	SA leading to strategic discussion or decision is as per definition of SA in Chapter 1 of thesis.	
3	The word strategic is implied before 'Discussion' and 'Decision'	

Figure 3. 7: Guidelines for categorising ‘SA in Action’

These guidelines support the critical realism philosophy to identify key events related to the phenomenon of ‘SA in S&OP’ and investigate the causal structures and mechanisms that trigger the actual events that in turn trigger the observed (empirical) event. As highlighted by Mingers and Standing (2017), absence can quite often be an event and hence the importance of capturing ‘missed discussions’ and ‘missed decisions’.

Due to the large amount of data captured over an extended period of time a structured database was created to store all data files, as recommended by Yin (2009). The database grew as data capture progressed through to the data analysis and key findings phases. Figure 3.8 shows the initial structure of the database for the data capture phase:

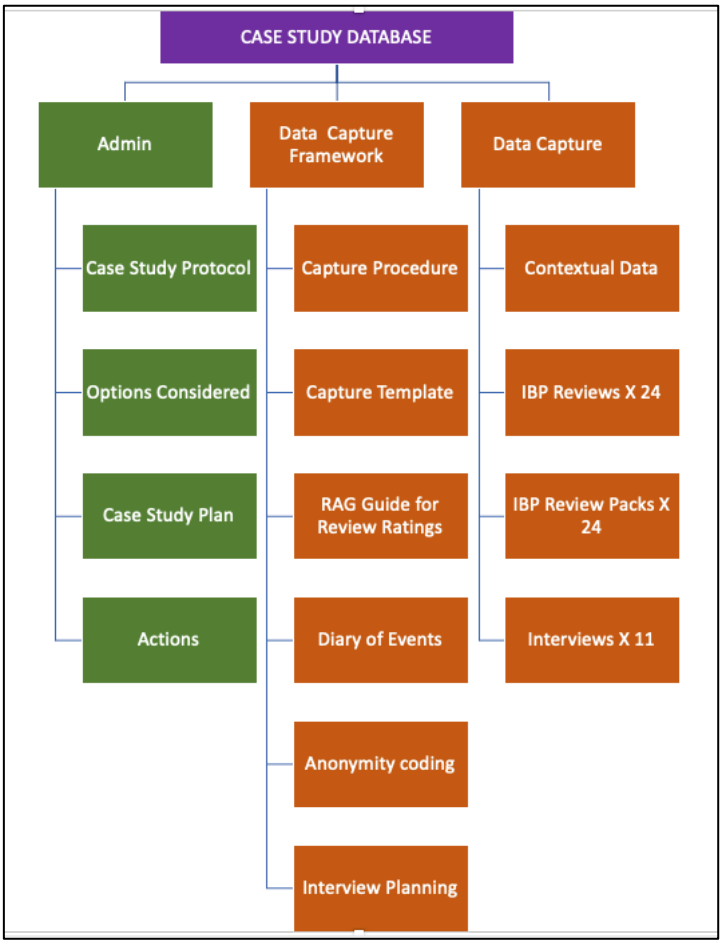


Figure 3. 8: Database Structure for the Data Capture Phase

A diary of key events during the case study was maintained in the database. A copy of this diary is in Appendix 6.2. Following the Covid-19 pandemic, 'BigPharma' were operating a flexible work environment with a mixture of on site and remote working. Therefore, the review meetings were scheduled as video conference calls. For these calls the researcher remained on mute with camera off throughout.

During the review meetings there were various instances where the researcher identified the need for further explanations. These were noted in the data capture template section called 'Follow-up Actions' and each action was later assigned to a target interviewee(s) for questioning.

The data capture templates, once completed following each review meeting, provided an evidence based perspective of the prominence of each element of the conceptual framework (CF3).

3.3.4 Data Analysis Process Overview

When deploying the *Gaps and Holes* approach to theory development, Ridder (2017) prescribe that the primary approach is one of *"pattern matching",* with the objective of achieving *"analytic generalisation"* (Ridder, 2017, p.289), for which the starting point is the conceptual framework with supporting research questions and propositions. The objective is to determine whether there is a match with the empirical data gathered from the exemplar case study of the phenomenon under investigation. The pattern matching approach is also encouraged by Yin (2009), especially for explanatory focused case studies. Yin cautions about broad narratives and suggests that having some *"theoretically significant propositions"* (Yin, 2009, p141) that can be tested, allowing for more precision in the conclusions.

While the focus is on determining the prescriptive value of the conceptual framework in practice, the researcher needs to remain open to new antecedents, mediators, moderators and outcomes which could enhance the explanatory power of the framework (Ridder, 2017). Such analysis can support the explanatory objective of the case study and help to explain the phenomenon more precisely.

The challenge for the researcher is to take a complex phenomenon supported by a large amount of data and distilling down the findings to their relevant component parts, matched against the conceptual framework (Miles and Huberman, 1994). A critical part of this are the displays that are used such that they can be arranged systematically when addressing the research questions. According to Miles and Huberman (1994) such displays fall into the category of matrices, with rows and columns and networks, with a series of linked nodes. In building the displays it is essential that a precise record is maintained of the criteria used to assign categories and ratings.

One such matrix put forward by Miles and Huberman (1994) is a *conceptually clustered matrix* (p.127). This approach supports the data reduction goal by clustering potentially several research questions such that meaning can be extracted to demonstrate conceptual coherence. Another relevant matrix is the *effects matrix* (Miles and Huberman, 1994, p.137), whereby key dependent variables are analysed in terms of their *effect* on an observed outcome. Ultimately, what is investigated in the case study research is whether the *causal network* (Miles and Huberman, 1994, p. 151), defined by the conceptual framework, stands up when compared to the empirical evidence from practice. It is of course possible that the learnings will challenge and potentially change some of the causal network relationships leading to an updated framework.

In the case study the *pattern matching* approach supported by *effects matrices* were adopted for analysis of data captured from observing the review meetings. For the interviews, Thematic Analysis (TA) as described by Braun and Clarke (2006) was used. This approach supported a data reduction exercise to ensure that the key implications to CF3 were extracted from the interview narratives.

Data available for analysis came from the primary sources as outlined earlier and summarised in Figure 3.9:

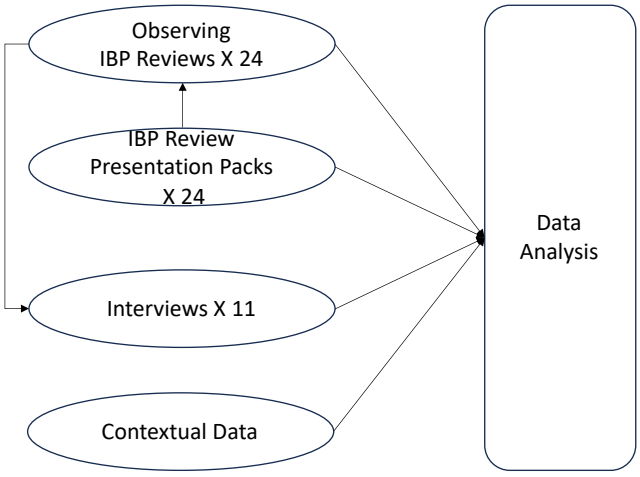


Figure 3. 9: Sources of data for analysis

The data associated with twenty four IBP review meetings was captured in the data capture templates described earlier. The twenty four review packs were PDF files (of powerpoint presentations) provided by 'Bigpharma' in advance of each review meeting, which provided the core information presented in the review meetings, including backup information. The eleven interviews, that were triggered from observing the review meetings, were recorded and then transcribed into word files. The contextual data that was provided by the IBP Process Leaders was captured as key points of information in the password protected file that contained the codenamed links to key identities of informants and company details.

The data analysis steps involved a series of iterations to achieve data reduction. Preliminary analysis was reviewed by the research team at periodic points during the case study, but the final analysis and ultimate findings were not concluded until the final review meeting was attended and the final interview was conducted.

The analysis conducted, guided by the Research Propositions (RPs) in addressing the Research Questions (RQs), involved a number of approaches and is summarised in Figure 3.10.

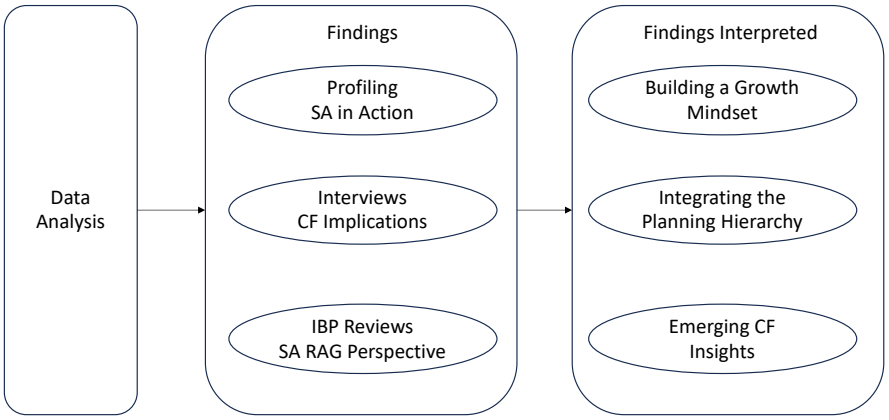


Figure 3. 10: Data Analysis Outputs

The initial analysis, using the pattern matching approach, involved investigating the elements of the Conceptual Framework (CF3) that demonstrated supporting evidence to explain when Strategic Alignment (SA) discussions or decisions were observed. Equally, the researcher identified situations where SA discussions and/or decisions were missed. In the latter situation the analysis turned to the elements of the CF that were not in play and why. The findings from this analysis are titled 'Profiling SA in Action' and covered in section 6.2.1.

The next part of analysis investigated the narratives provided by respondents from the semi-structured interviews. Transcripts of the interviews were coded and thematic analysis extracted key CF Implications that informed the construct and/or content of CF3. Using the Thematic Analysis (TA) approach prescribed by Braun and Clarke (2006) the researcher sought to go beyond the surface narratives from the interviews and combined with observations in the review meetings, a number of latent themes were identified. These themes contributed significantly to the final conceptual framework adjustments when forming CF4. This analysis is described in sections 6.3.1-6.3.5.

A specific analysis was prompted through observing that not all review meetings in the observed IBP process had equal opportunity to engage in SA, based on their purpose. A structured analysis applied the RAG (Red, Amber, Green) status to each of the reviews to signify their relative significance for SA engagement (section 6.2.2).

Through observing the behaviours and language used in the review meetings, a deeper understanding of what is involved in developing the intangible "growth mindset" was formed. This analysis is presented in section 6.3.6.

Analysing the evidence from observing the reviews and from the interviews enabled a detailed description of how the IBP process is linked to the strategic plan and the operations plan, within the overall planning hierarchy. This is described in section 6.3.7.

Even though the research propositions from the CF3 framework provided the primary boundaries for the research study, it was important for the researcher to be aware of potentially new emerging aspects to the phenomenon under investigation (Yin, 2009). The final part of the analysis (section 6.3.8) highlighted new emerging aspects related to CF3, either in terms of updating the structure or providing more in depth description of the elements and relationships that made up CF3.

3.3.5 Quality of Results

When conducting analysis Yin (2009) provides four principles for high-quality data analysis:

- Attend to all the evidence.
- Address all major rival interpretations.
- Should address the most significant aspect of the case.
- Use your own, prior, expert knowledge.

Setting up a structured database and constructing templates based on the research protocol were important aspects to ensure that all the relevant evidence could be captured and then methodically address the full scope using appropriate tools. Through the various iterations of analysis the set of potential rival explanations was constantly revisited and updated to provide confidence before concluding on key insights and themes. The reduction process to zone in on the most significant aspects of the case was a challenge and needed strong discipline to stay focused on the research questions and propositions coming from the conceptual framework. In particular with the researcher having extensive expert knowledge on the topic from many years working in industry, this was a key factor in understanding and interpreting the information gleaned from observing the review meetings and conducting the interviews. In line with the critical realism research philosophy the values and beliefs of the researcher aligned with an approach to uncover causal mechanisms to what was observed. The critical realism orientation of the researcher was evident from the HARP (Heightening your

Awareness of your Research Philosophy) self-assessment exercise completed (see HARP results in appendix 3.1). The extensive experience of the researcher was valuable in appreciating the dynamics at play when observing the review meetings. However the researcher also had to be conscious to minimise the risk of confirmation bias (Tversky and Kahneman, 1974). This was achieved through following the research design as outlined in the case study research protocol (appendix 6.1) and constantly seeking rival explanations before drawing conclusions.

It is important to make sure that the process stands up to being *credible* and *trustworthy* (Saldana et al., 2011). The researcher has to demonstrate honesty and integrity in approach through providing sufficient detail for the research approach to be replicated if required. This includes explaining the range of data gathering sources and techniques, the key tools used to analyse and reduce the data and how other potential explanations were addressed. How this was achieved is presented in the case study chapter (section 6.4.6).

The context is an integral part of the case study analysis and determines the extent of generalisability of the findings. The integrated aspect of the context should be embraced when it comes to analytical generalisations (Yin, 2009) but there may be some compelling aspects to put forward an argument for a level of theoretical generalisability also. For the specific case in this research study there were key contextual considerations which are discussed in detail in Chapter 6.

The guidelines provided by Miles and Huberman (1994) were also valuable in building the robustness of the findings. Multiple sources of data were obtained when building the explanatory narrative. Iterative rounds of analysis were conducted with contributions from the extended research team of three. Two rounds of feedback were conducted with the case study business at the end of the study.

3.3.6 Case Study Business

As per the case study protocol, based on the starting point being an existing conceptual framework, it was important to find a case study business who would be regarded as exemplary when it comes to 'SA in S&OP'. With the recognition that companies continually struggle to achieve 'SA in S&OP' (Alexander, 2013, Turner, 2018), finding a case study business who are regarded as strong in this respect, and who are willing to be involved in the research project, was challenging. However, by leveraging the network that the researcher

had built up over many years as an international business consultant and having had discussions with some potential companies, the primary target of a large Pharmaceutical business, codenamed 'BigPharma', agreed to be the focus business for the research. Significantly 'BigPharma' had been formerly certified with Class A certification for their IBP process, by the Oliver Wight company in late 2020. The certification was based on the published Oliver Wight Class A standard (Wight, 2017) which sets the expectation of demonstrating that the IBP plan is aligned with the strategic plan. This positioned 'BigPharma' as an *intensity* sample as outlined by Patton (2002a). Therefore, the expectation was set for this case study business to be a good example for observing the 'SA in S&OP' phenomenon and investigating the environment and processes that facilitate it.

3.4 Summary

This chapter presented the research philosophy of critical realism that underpinned the research journey and why this was appropriate. The two field research methods of the Delphi Study and Case Study were described. These studies formed an integral part of the research process of building a practical conceptual framework, through iterations of moving between theory and practice. A detailed description of how the methods were deployed and the associated findings are covered in the later chapters, with the Delphi Study covered in Chapter 4 and the Case Study in Chapter 6.

CHAPTER 4: THE DELPHI STUDY

4.0 Introduction

In this chapter, the Delphi field study process is described and the key findings are presented. Each of the three rounds conducted are explained resulting in a consensus on an updated conceptual framework. The objective of performing a Delphi study was to provide an empirical perspective from the field on the initial conceptual framework (CF1) emerging from the Integrative Literature Review (ILR). The Research Propositions (RPs) and Research Questions (RQs) provided the guidance for the Delphi study engagement.

The Delphi research methods have been described in Chapter 2. Therefore after a brief introduction to the approach taken, this chapter reports on the findings through each of the Delphi rounds before the final conclusions are discussed. Supporting material is referenced to the appendix as appropriate.

4.1 Delphi Approach

The Delphi study was an important step in the research journey to provide expert field input to the conceptual framework (CF1) arising from the ILR. As 'SA in S&OP' is a phenomenon that thus far has not been investigated in depth by the academic community, it was important to engage with the field early in the research process, once an initial framework had emerged from the ILR process. This afforded the opportunity to challenge CF1 in an abductive manner, through seeking consensus on what aspects of CF1 resonated with the field experiences of the experts (deductive), while also being open to insights that could enhance the framework (inductive). In line with the critical realism research philosophy these approaches to theory development supported the capture of key insights from the field in support of the evolving framework.

The Delphi study is an effective mechanism when a starting framework is available and a team of recognised experts can provide their perspectives on how representative the framework is, versus their experience in practice. One of the significant challenges is the recruitment of a group of experts. However, in this situation the fact that the researcher had previously spent ten years as a senior S&OP/IBP consultant in the field, meant that it

provided access to key experts. In order to ensure that true experts were recruited, the filtering criteria as described in Chapter 3 were deployed resulting in an eligible panel of fifteen experts.

Starting with the initial Conceptual Framework (CF1), after 2 rounds of expert inputs an interim updated framework was presented to the experts. Ultimately a sufficient level of consensus was reached after 3 rounds. This resulted with a framework (CF2) emerging, ready for the next stage of the research study. The Delphi study took 9 months to complete from the recruitment of experts in January 2022 through to the issuing of the final report in September 2022. This allowed sufficient time between the rounds to conduct the analysis and structure the subsequent round, while ensuring there was not a big time-lag between rounds where respondents could lose interest. Having fourteen of the fifteen respondents stay engaged from start to finish indicates that the timing supported the engagement.

In the next section the Delphi results and conclusions from each round are described. In presenting the findings from the Delphi study each round is taken in turn and described in terms of the inputs, consensus achieved and areas requiring further investigation in subsequent rounds.

To preserve anonymity, where direct quotes are included, they are referenced relative to the S&OP/IBP roles of the experts. The following table provides context to these roles. Note that a DM (Decision Maker) means someone who is a chair in the S&OP/IBP meetings and therefore has ultimate decision making responsibility. PF (Process Facilitator) is someone who orchestrates the S&OP/IBP meetings, working with a team to complete the preparation and ensure the right topics are up for discussion in the S&OP/IBP meetings. CT (Consultant) is someone who supports organisations to design and implement S&OP/IBP processes and supports them to maximise the capability of the process.

Table 4. 1: Anonymous reference table for Delphi expert quotes

Code	S&OP Role	Seniority Level	Country Base	Geographical Scope of Role	Industry Sector
DM1	Decision Maker	Vice President	Ireland	Europe	Medical Products & Instruments
DM2	Decision Maker	Vice President	Ireland	Global	Pharmaceutical Products
DM3	Decision Maker	Vice President	Portugal	Global	Pharmaceutical Products
DM4	Decision Maker	Vice President	Switzerland	Global	Pharmaceutical Products
DM5	Decision Maker	Director	Ireland	Global	Food Products
DM6	Decision Maker	Vice President	Ireland	Global	Food Products
DM7	Decision Maker	Vice President	Ireland	Global	Medical Products & Instruments
PF1	Process Facilitator	Director	Ireland	Global	Consumer Electronics
PF2	Process Facilitator	Director	Switzerland	Global	Pharmaceutical Products
PF3	Process Facilitator	Director	Ireland	Europe	Medical Products & Instruments
PF4	Process Facilitator	Director	Sweden	Global	Medical Products & Instruments
PF5	Process Facilitator	Director	Germany	Europe	Pharmaceutical Products
CT1	Consultant	Partner	UK	Global	Consultancy
CT2	Consultant	Partner	UK	Global	Consultancy
CT3	Consultant	Partner	Germany	Global	Consultancy

The design of surveys across the Delphi rounds was guided by the research agenda concluded from the Integrative Literature Review (ILR). The Research Propositions (RPs) and associated Research Questions (RQs), as outlined in Chapter 2 (Table 2.3), provided the

framework for the specific questions posed in the surveys. The objective was to obtain consensus across the panel of experts on the specific topics, with consensus being defined as greater than 75% agreement, as outlined in Chapter 3 (Section 3.2.3).

When conducting the analysis between rounds, differing methods were used depending on whether the data was qualitative (descriptive coding and qualitative content analysis) or quantitative (analysing percentage responses). All the resulting analysis charts for all three rounds are contained in Appendices 4.6-4.8.

4.2 Delphi Round 1

At the start of the Delphi study, a document was circulated to each of the expert panellists that provided a brief description of the initial conceptual framework (CF1) emerging from the ILR. It was explained that this framework would provide an overall structure to the questions that would be asked in the subsequent survey rounds. A copy of this explanatory document is included in Appendix 4.1. The conceptual framework CF1 is shown in Figure 4.1.

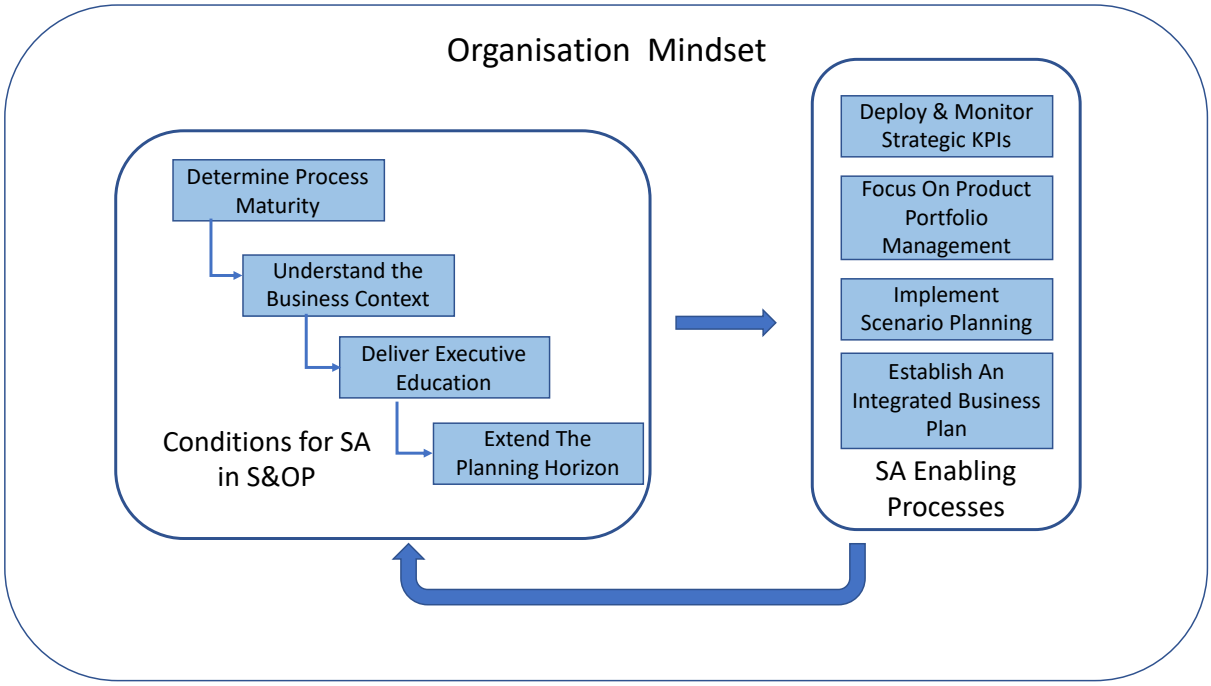


Figure 4. 1: Initial Conceptual Framework (CF1)

4.2.1 Inputs to Round 1

In line with the abductive approach, the survey questions in round 1 were designed to solicit the experts views on each of the constructs of CF1 combined with open ended qualitative questions to allow the experts to openly share their experiences when striving to achieve 'SA in S&OP'. After capturing demographic information (Q1-Q5), the next batch of questions (Q6-Q10) were designed to understand how important the experts viewed SA, what it can deliver and why companies might struggle to achieve it. By addressing these questions, in addition to providing an overall picture of how 'SA in S&OP/IBP' was perceived by the experts, it oriented them onto the specific topic under investigation. The next set of questions (Q12-Q19) were directly triggered by the Research Propositions (RPs) and Research Questions (RQs) associated with CF1 (repeated in Table 4.2). Note that the setup of the Qualtrics survey tool was such that some guidelines provided during the survey were labelled as questions by the tool (see note at the end of the table). The link to the survey questions from the RPs and RQs is shown in Table 4.2:

Table 4. 2: Linking the Survey Questions to Research Propositions and Questions

Propositions	**Research Questions**	**Round 1 Survey Questions**
1. To achieve 'SA in S&OP' the following conditions are required and in the following sequence: Determine process maturity -> Understand the business context -> Deliver executive education -> Extend the planning horizon	1(a): Which, if not all, of the conditions are important for 'SA in S&OP'? 1(b): Does the proposed sequence of the conditions hold in practice or do other sequences emerge? 1(c): What other conditions are important for 'SA in S&OP'?	Q12 Q13 Q14
2. The following processes are fundamental to implementing 'SA in S&OP': Deploy and monitor strategic KPIs / Focus on product portfolio management / Implement scenario planning / Establish an integrated business plan	2(a): Which, if not all, of the SA processes are valid to achieve 'SA in S&OP'? 2(b): What other processes should be included to achieve 'SA in S&OP'? 2(c): What, if any, is a logical sequence to implementing the SA enabling processes?	Q15 Q16 Q17

3. The introduction of an iterative process with closed loop feedback from the SA processes to the conditions, supports embedding 'SA in S&OP'.	3(a): How important and why is it important to have a closed loop feedback process from the SA enabling processes back to the conditions for SA?	Q18
4. The collective conditions and enabling processes, setup in a closed loop feedback manner, are key to achieving an engaged organisation mindset for achieving 'SA in S&OP'.	4(a): How and why is it important to have a closed loop process to deliver the right organisation mindset for 'SA in S&OP'? 4(b): What, if any, other elements should be considered when building the right organisation mindset for 'SA in S&OP'?	Q19

Note: Q11 & Q11a even though numbered as questions in Qualtrics survey tool were in fact guiding instructions to the respondents.

The next set of questions (Q20-Q22) sought to obtain input from the expert panel on the significance of having an Information Technology (IT) enabled process in support of 'SA in S&OP/IBP'. The suggestion that IT could have a role to play in enabling 'SA in S&OP' emerged as part of the 'maturity' theme in the ILR. While it was acknowledged that the subject of IT enablement in S&OP/IBP was a research topic in its own right, these questions were designed to leverage the opportunity of having a group of experts engaged, to gather some data in support of a potential future research study. The analysis of the data associated with these questions is covered in appendix 4.10.

The final question (Q23), in line with ethics approval, allowed that any information that was provided, may be categorised as "company confidential", and therefore not shared across the expert panel.

In summary, when taking into account all the questions and sub-questions, the survey for round 1 was made up of 16 open ended qualitative questions, 11 closed quantitative questions, 5 demographic capture questions and 1 question to confirm consent. A copy of the survey is shown in Appendix 4.2.

4.2.2 Consensus from Round 1

In conducting the analysis to determine where consensus was reached, both quantitative and qualitative analysis resulted in key insights. The findings from both sets of analysis are presented in this section.

Insights from quantitative analysis

From a quantitative analysis perspective, consensus was recorded from a number of the closed questions based on the >75% agreement threshold, as listed in Table 4.3.

Table 4. 3: Quantitative Analysis providing Consensus from Round 1

Question No.	Focus	Results	Research Objective
Q6	Importance of 'SA in S&OP'	100% viewed it as important (67% as extremely important and 33% as very important)	Confirms field view that the research topic has merit.
Q7	Typical horizon focus in S&OP*	47% aligned on 0-3 months 87% aligned on 4-12 months 73% aligned on 13-18 months 60% aligned on 19-24 months 27% aligned on >25months	Captures the typical experiences related to the 'horizon' construct in CF1 / RQ-1(a).
Q8	What horizon should be the focus in S&OP*	13% aligned on 0-3 months 80% aligned on 4-12 months 87% aligned on 13-18 months 93% aligned on 19-24 months 60% aligned on >25months	Captures the practice perspective on what is required, related to the 'horizon' construct in CF1 / RQ-1(a).
Q9	Does SA support decision making in S&OP	73% selected 'Definitely' 27% selected 'Probably'	Confirms value of 'SA in S&OP' to close gaps to strategy, as positioned as part of problem statement.
Q12	Which conditions are required for SA	73% indicated 'all' conditions 27% selected a sample of the conditions	All of the conditions of CF1 confirmed as being required, addressing RQ-1(a).
Q14	Which of the enabling processes are relevant for SA	100% confirmed that all of the enabling processes were relevant	All of the processes of CF1 confirmed as being relevant, addressing RQ-2(a).

Q18	Importance of closed loop feedback	100% viewed it as important (87% as extremely important and 13% as very important)	Feedback loop construct of CF1 confirmed as important, addressing RQ-3(a).

*Note: Where respondents were permitted to select multiple options then %'s will total >100%

As shown in Table 4.3, the quantitative analysis pointed to consensus in a number of important areas. Beyond confirming the importance of the research topic (Q6 & Q9), the data addressed a number of the research questions.

The findings related to the horizon in focus during S&OP meetings and more importantly, where the focus should be, provided confirmation of the need to have a longer-term horizon to support 'SA in S&OP (Q7 & Q8). The experience of the experts pointed to 4-12 months as the typical horizon (87% consensus on Q7). However, the opinions relating to what the horizon should be, in order to enable SA, showed a shift in consensus to 19-24 months (93% on Q8). This brought clarity to defining the 'Extend the Planning Horizon' condition when addressing RQ-1(a).

All of the CF1 constructs associated with the conditions and enabling processes were considered important, in support of RQ-1(a) and RQ-2(a) respectively. Similarly the feedback loop construct of CF1 was confirmed as being important, as per RQ-3(a). Some of the supporting quotes from the experts reinforced the importance of the feedback loop:

- *"If the SA processes are not working effectively the root causes are likely to be within the SA conditions...so there needs to be an ongoing review of the process effectiveness and desire for learning and continuous improvement"* (CT1).
- *"Without a periodic feedback loop and review process, the two may become misaligned. It's not a one way process, because either can vary and realignment allows everyone reset and plan any additional changes/ adjustments"* (DM7).
- *"For a truly effective process you have to have both. SA is not going to be enabled if you don't have the right conditions in place first. There needs to be a regular evaluation and feedback for the process to be refined to achieve and maintain the target state"* (PR1).

The qualitative backup to the strong support for the feedback loop prompted some further investigation in the next round to determine whether certain conditions were more prevalent in terms of relevance and potential impact of feedback.

The quantitative analysis confirmed the constructs of the existing conditions, enabling processes and feedback loop, as part of the proposed conceptual framework (CF1).

Insights from qualitative analysis

A number of open questions afforded the opportunity to provide support for consensus positions and to capture potentially new insights from the field experts. Qualitative analysis was employed to assess the narratives in response to these questions. The NVIVO software tool was used for efficiency and transparency. Descriptive coding (Saldana, 2013) supported the categorising of relevant comments and the assignment of appropriate labels. This enabled analysis to be conducted to highlight feedback that supported the quantitative consensus and insights that required investigating further in subsequent rounds.

In support of consensus achieved, the responses to a couple of questions provided further reinforcement as summarised in Table 4.4.

Table 4. 4: Qualitative Analysis supporting Consensus from Round 1

Question No.	Focus	Results	Research Objective
Q13	Does the sequence of conditions relate in practice	Prominent feedback that sequence should not be prescriptive	Remove the sequence of conditions in CF1, addressing RQ-1(b).
Q19	Key considerations when building an organisation mindset to enable SA	Multiple comments pointed to 'Leadership', 'Communication', 'Governance' and 'Discipline'.	Provided insights to building an organisation mindset that supports SA addressing RQ-4(b)

The findings challenged the sequencing of conditions as set out in CF1. In Q13, the respondents were invited to provide alternative suggestions for the sequencing of the conditions, if they did not agree with the sequencing in CF1. The results provided multiple

suggestions for what was considered an appropriate sequence. The indication was that it depended on the particular business context:

"It depends on the starting-point and the maturity of the organization. With no / low maturity and buy-in to the S&OP/IBP process, the executive education can be a good starting point to answer the question WHY shall we do this" – PF4.

"I see the business context, and the definition of the appropriate time horizon as an appropriate starting point" – CT1.

The above quotes are reflective of a perspective across the respondents who suggested differing sequences to the conditions.

Even though there was no consensus on the sequence of conditions in CF1, seven of the fifteen respondents suggested that 'Executive Education' should come first.

"Start with 'education' and alignment from the top down" – DM5.

"In my experience: 1. Drive executive education" – PF2.

"From my experience Executive education should be up front" – DM6.

Interestingly, none of the three consultants, who would be providing education as part of their role, were among the seven respondents that made this suggestion. Therefore the analysis would indicate that while executive education was viewed as an important condition, all three consultants viewed understanding the business context as the first step. This would be reflective of the typical consultant approach of diagnosing the situation first before defining the appropriate approach.

Therefore, the findings indicated, that in addressing RQ-1(b), the sequence proposed in CF1 should be removed. The consensus remained that all the conditions were important and conducting executive education was particularly important.

Organisation mindset represents an intangible aspect of the CF1 framework. An open question (Q19) sought viewpoints on aspects to consider when building an organisation mindset to enable 'SA in S&OP'. The responses provided a range of considerations and by leveraging descriptive coding techniques some prominent themes emerged.

(i) Leadership commitment: Making sure that the leadership of the business are fully bought in to the full ambition for the S&OP process and that they lead by example. A selection of relevant quotes in support of this theme:

"100% buy-in from the CEO [Chief Executive Officer] and SLT [Senior Leadership Team]" – DM6

"Leadership needs to be aligned on the ambition" – DM2

"It needs to start with securing the buy-in of the senior management team and through their visible engagement and advocacy of the process for it to cascade throughout the organisation" – PF1.

"Leadership demonstrating the mindset" – CT3

(ii) Communication of the Strategy and importance of SA: The strategy for the business is effectively communicated by the leadership team. In addition the reasons why SA is important should be communicated.

"Strategy clearly articulated, communicated and understood by the whole Organisation" – CT2.

"Be mindful to understand and communicate about the benefits, outcome, limitations of the SA to the different stakeholders" – PF4.

"Culture- critical is being embedded in the organisations DNA. This requires education, communication on purpose, buy in, commitment and training" – DM7.

(iii) Encourage the right behaviours: Establish the required behaviours in support of a set of values and find ways to encourage these behaviours.

"Ensuing that there are clear values established and the required behaviours have been developed from within the organisation and they are regularly rewarded and recognised by the senior leadership team" – PF3.

"Discipline to follow the process" – PF5.

"Defined behaviours - Open culture to call them out" – CT3.

These insights provided support for key considerations when developing an organisation mindset for 'SA in S&OP', in support of RQ-4(b). The considerations presented by the experts provided valuable input into building a descriptive narrative to describe what is involved in building the 'organisation mindset' when striving to achieve 'SA in S&OP'.

The areas where consensus was reached from round 1 of the Delphi were recorded, and revisited as part of the final synthesis, once data saturation was obtained following the three rounds.

4.2.3 Areas requiring further investigation from Round 1

With the diverse experience of the expert panel the qualitative feedback brought forward insights that could potentially challenge the constructs of CF1. These insights were captured for further investigation in subsequent rounds to determine if consensus existed among the broader group.

Each of the insights identified for further investigation are highlighted in Table 4.5 and subsequently described in terms of how they arose from the round 1 analysis. These topics formed the basis for the design of subsequent rounds.

Table 4. 5: Areas for further investigation from Round 1 Analysis

Ref No.	Question	Focus	Insight for further investigation	Research Objective
1	Q10	Why organisations struggle with SA	How to make Strategy visible? How to avoid the impact of short-term focus? How important are aligned incentives?	Other considerations for Conditions, Enabling Processes or Organisation Mindset as per RQ-1(c), RQ-2(b), RQ-4(b)
2	Q12a	Perspectives on CF1 Conditions	What aspects of process maturity influence SA achievement? Does the importance of education extend beyond the executive team? Input on relative importance of conditions	Deeper understanding of Condition constructs as per RQ-1(a)
3	Q19 & Q14, Q16	Considerations for building organisation mindset. Other CF1 construct considerations	Is there consensus across the group on specific contributions for building organisation mindset? Specifically: assumptions management, strategic project management, lead-time for decisions, trust that decision maker has in the S&OP team, clarity of roles and responsibilities.	Other considerations to be considered for building organisation mindset as per RQ-4(b). Also other considerations for Conditions and Enabling Processes as per RQ-1(c) and RQ-2(b)
4	Q16 multiple Q responses	Other enabling processes to be considered	Should Financial Integration be more explicitly evident in the structure of the conceptual framework?	Other considerations for Enabling Processes as per RQ-2(b)

5	Q7a	Types of decisions to be made in S&OP	Is strategic decision making an indicator of SA?	Other considerations for Enabling Processes as per RQ-2(b)
6	Multiple	How to achieve SA	How is the link maintained between S&OP and the business strategy?	Other considerations for Conditions or Enabling Processes as per RQ-1(c) and RQ-2(b)

1. Analysis of the reasons why companies struggle to achieve SA (in response to Q10), highlighted a number of areas that prompted further investigation to determine if they suggested a change to CF1.

   (i) Lack of visibility of the Strategy: The strategy needs to be clear for the organisation if SA is to be achieved. Relevant quotes include:

   "Poor strategy which is also unclear and not communicated to the whole Organisation in a consistent manner" – CT2.

   "Not fully grasping how to develop and create a strategy that is executable" – DM4.

   "Unclarity or under-communication of the business strategy" – DM3.

   The feedback highlighted the fundamental requirement of having the strategic plan visible in the S&OP process if striving to achieve 'SA in S&OP'. This merited further investigation to delve into the experts experience on how to achieve this.

   (ii) Short-term issues take priority: The immediate short-term issues deflect attention away from addressing the longer-term issues as highlighted by these selected quotes:

   "Many issues to be solved in the operational horizon lead people to focus on the short-term rather than looking at the future" – PF5.

   "From my experience people worry about what they see just in front of them. Problems of this week and this month" – DM6.

   "Companies get so bogged down in the day to day [operational] activities that they can't or don't focus on achieving or discussing strategy" – DM5.

   If short-term issues can deflect attention from the longer-term agenda, then the analysis prompted further investigation as to how to reduce the risk of this occurring

for organisations to be successful in engaging the longer-term strategic discussions and decisions.

(iii) Incentives not structured for SA focus: If incentives are not setup to orient the organisation towards a longer-term focus in the S&OP reviews, the longer-term focus is not encouraged.

"Incentives are not seen and used as tool to align and integrate" – CT3.

"Ensuing that there are clear values established and the required behaviours have been developed from within the organisation and they are regularly rewarded and recognised by the senior leadership team" – PF3.

Recognising that incentives can encourage behaviours, this aspect was identified as having merit for further investigation to obtain perspective across the expert group as to whether incentives could be structured to encourage organisation orientation towards 'SA in S&OP'.

2. From the analysis of the importance of the Conditions constructs (Q12a), a number of insights merited further investigation:

   (i) Differing interpretations emerged as to the intent of the 'Determine Process Maturity' condition. Selected quotes from the qualitative feedback highlight the differing points of view:

   "Without the process maturity SA will not be solid or sustainable" (DM4).

   "It is important to realize process maturity and current position. That enables realism around the starting position" (CT3).

   This suggests, in addition to ascertaining the level of maturity, a certain level of maturity is required before SA should be pursued. This was an insightful contribution that resonated with findings in the ILR (Chapter 2) where maturity models suggested strategic alignment was associated with higher levels of maturity (Danese et al., 2018). Therefore, this was an area that merited further investigation.

   (ii) In the scope of responses to Q12a, an insightful input from one respondent suggested that education is important for a cohort that goes beyond the executive team.

"Drive education across the organization. Both for process participants but also a lighter version for others on a need to know basis" (PF4).

The suggestion that education was not only important for the executive level merited presenting the suggestion to the entire group to determine if it resonated based on their experience.

(iii) The qualitative feedback related to the sequencing of the conditions, having produced a range of suggestions, without any consensus, prompted a question as to the relative importance of the conditions, which was investigated in round 2.

3. The qualitative questions Q14, Q16 & Q19 provided the opportunity for respondents to propose other constructs or considerations for the conditions, enabling processes and organisation mindset respectively, of CF1. A number of specific topics, reflecting the differing experiences across the expert panel were identified, such that they could be presented to the entire group in round 2 to assess relevance.

(i) Assumptions management: One respondent emphasised the importance of tracking assumptions. Ensuring that the integrated plan was supported by explicit assumptions was an aspect emerging from the partitioner literature (Baumann, 2009, Cecere, 2005), as part of the ILR (Chapter 2). Therefore, even though the contribution was just from one Delphi respondent, it was identified as an area to be investigated further in round 2.

"Numbers underpinned by assumptions that undergo a truly rigorous review as an integral part of the process" – PF1.

"Tracking which assumption actually worked in implementation and tracking what is changing in the business environment" – PF1

(ii) Strategic projects management: An insight from a decision maker, who was also the chair of the Management Business Review (MBR), introduced the importance of tracking strategic projects, recognising that they are typically run over multiple years.

"Linkage with the PMO [Program Management Office] is also important particularly to ensure that strategic initiatives/projects deliver every year and not just in the year that all the eyes of the business are on them" – DM6

Reflecting on why the chair of the MBR would view this as important to SA prompted the topic to be included for further investigation across the expert panel in round2.

(iii) Lead-time for decisions: One of the S&OP/IBP facilitators from the expert panel, brought forward the concept of understanding the decision lead-time associated with longer-term decisions as a trigger for when decisions need to be made and therefore when would need to be supported by SA. This insight triggered the concept of timing of longer-term decision making and when SA was important as a result.

"understand importance of the decisions lead time to implement the most cost-effective solution, without rushing" – PF5.

This aspect was presented to the entire expert panel in round 2 to get their perspectives.

(iv) Confidence that decision maker has in the S&OP team: One of the Decision Maker (DM) respondents indicated that choosing the right S&OP team with specific mention of the meeting owner (i.e. Chairperson) and facilitator, was an important consideration.

"Choosing the right team and meeting owners and facilitators is key" – DM2.

Linking to strong input on encouraging the right behaviours (see section 4.2.2) this topic was presented to the expert panel in round 2, to see whether it was considered a topic to be included as part of the content description of the conceptual framework.

(v) Clarity of roles & responsibilities: Related to the previous insight, another Decision Maker (DM) respondent advocated that all roles and responsibilities in the process be clearly defined.

"Key roles and responsibilities laid out with the needed competencies clearly defined" – DM4.

The topic of the importance of defined roles and responsibilities was presented to the entire expert panel in round 2.

4. When the respondents were asked if there were other enabling processes that should be considered as part of CF1 (Q16), the aspect of financial integration was prominent in

the feedback and on further analysis through a word tree investigation (Figure 4.2), in the NVIVO tool, showed the *financial* aspect being raised across the survey responses.

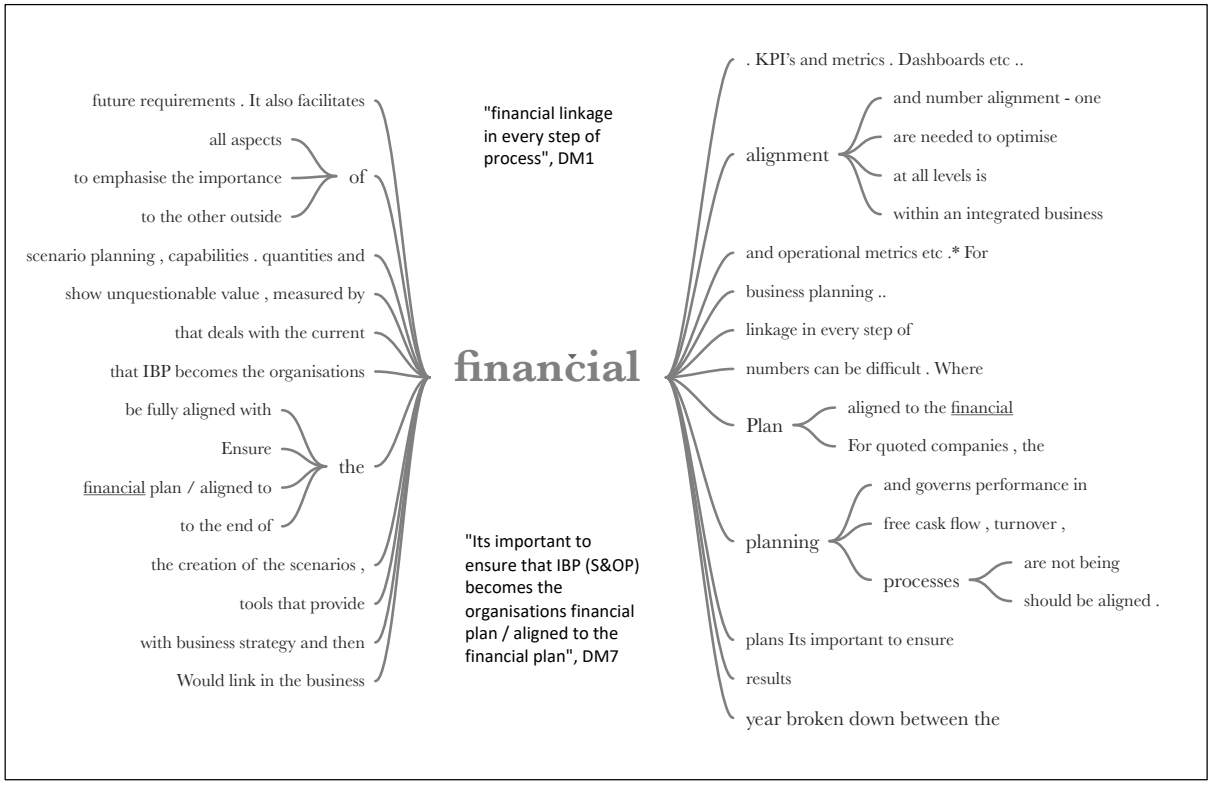


Figure 4. 2: Word tree showing the extent that financial aspects were emphasised in responses.

Key linked phrases like *"all aspects"*, *"at all levels"*, and *"be fully aligned with"*, show a belief that financial integration is important in support of SA. This is summarised by the quote from DM1 in Figure 4.2. The quote from DM7 emphasises the need to have one overall integrated plan such that the financialisaton of the S&OP plan becomes the financial plan for the business. Supporting phrases in the word tree include *"aligned to the financial"*, *"business planning"* and *"number alignment – one"*. Therefore, *financial integration* was presented to the entire panel in round 2 to determine how it might be represented in the framework.

5. When asked about the type of decisions experienced in S&OP (Q7a), an analysis across the range of the examples provided (N=35), showed that 54% were regarded as decisions that would require *Strategic Alignment* (SA) in place. Figure 4.3 shows the

outcome of the analysis with the orange colour reflecting decisions that would require SA.

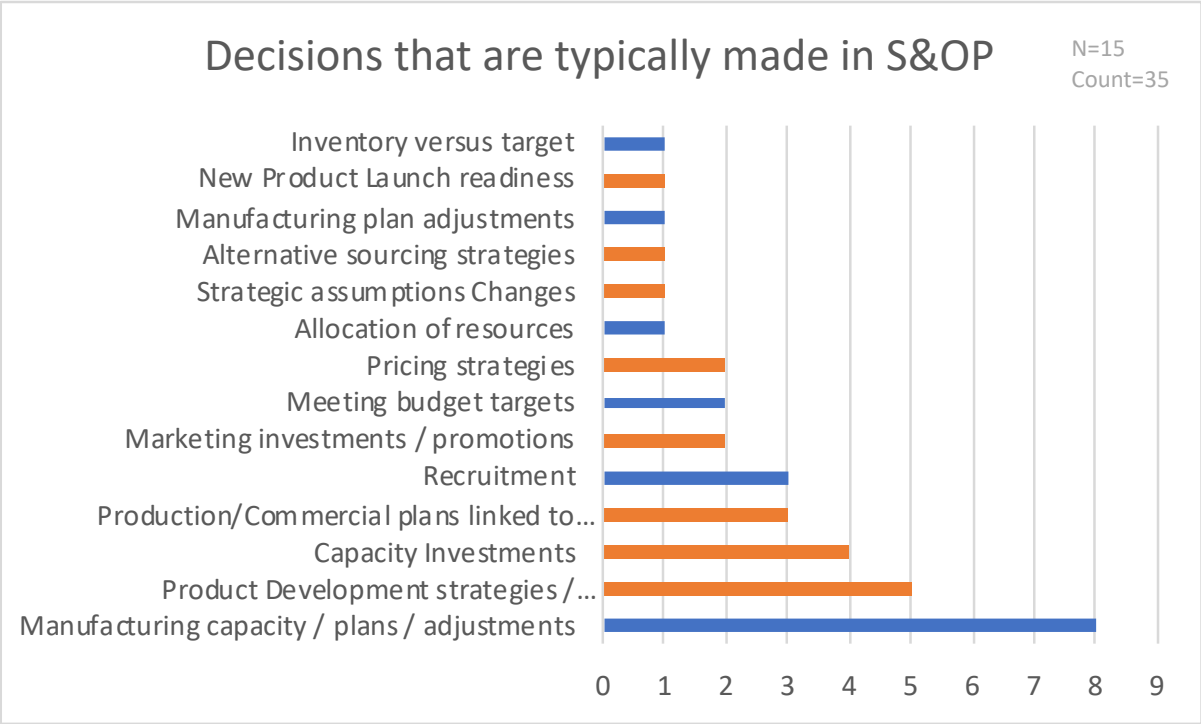


Figure 4. 3: Profiling responses on types of decisions made in S&OP

Some examples of such decisions from the source data include:

- *"Product development prioritisation"* - PF1.
- *"Decisions related to actions which are needed to close the gap for business performance projected for the next 12-24 months"* - PF2.
- *"The pricing strategies required to address market competition within defined segments plus the revenue and margin targets"* - PF3.
- *"Project re-focus anticipating regulatory changes required, replacing certain ingredients sooner"* - CT3.

It was interesting to investigate further whether the panel considered strategic decision making as an indicator of 'SA in S&OP' achievement.

6. The importance of the linkage to the strategy management process emerged from a number of comments made by the expert panel. They suggested that to keep the

strategic plan valid required a continuous feedback to strategy and realignment of the strategic plan. A selection of the comments that prompted further investigation are listed here:

- *"When this happens a 2-way connection is established between strategy, tactics and operations.. This helps the executive team to deploy the strategy through the business units....and, equally important, it enables ideas and issues to flow, bottom-up, from the business units to the strategy"* -CT1.
- *"Meetings feeding into the S&OP / IBP process are essential. If there is no 'strategy' meeting [which there may not be in some companies] then providing a feed into the S&OP / IBP process doesn't happen and subsequently 'alignment' to the strategy gets over-looked or misrepresented"* - DM5.

In addition other comments suggested that the strategy should be structured in a way to support alignment in S&OP:

- *"A strategy plan needs to be well structured to be translated into specific plans, projects, actions in the S&OP / IBP"* - PF5.
- *"Establishing a clear vision and mission is a first step to be taken"* - DM2.

Therefore the role of the strategy and the linkage with S&OP was presented in round 2 to the entire expert panel to determine if there were aspects of consensus that would influence CF1.

4.2.4 Summary Outcomes from Round 1

The most significant outcome from round 1 of the Delphi study is the validation of the major constructs of CF1 albeit with the removal of the proposed relationships (sequencing) of the conditions. Therefore there was partial support for Research Proposition (RP1) with answers confirming all the conditions were deemed important (RQ-1a) but that the sequence on the conditions were not supported, addressing RQ-1(b). Also, all of the enabling processes were considered valid in support of 'SA in S&OP', confirming RP2 and addressing RQ-2(a). There was no consensus on a sequence for the enabling processes and so they remained as standalone constructs in CF1, addressing RQ-2(c).

The feedback loop to revisit the conditional elements, should the processes not be capable of delivering SA, was an area that the expert panel identified with. The consensus achieved support for RP3, while addressing RQ-3(a). The requirement for an organisation mindset that is oriented for SA received strong consensus in support of RP4. In addition the collective

experiences of the expert panel provided rich content in support of understanding how to engage the right organisation mindset, addressing RQ-4(a) and RQ 4(b).

The qualitative feedback in particular provided valuable insights to further explain the constructs of the conceptual framework but also to expose some potential gaps to the structure of CF1, meriting follow-up in subsequent rounds.

The purpose of 'SA in S&OP' was positioned by the expert panel as supporting strategic decision making and also providing tangible examples of the types of strategic decisions made when SA was enabled. The conceptual framework CF1 did not focus on how to measure the achievement of SA and so this is an area that was pursued in subsequent rounds to get the perspectives of the entire expert panel.

The positioning of the S&OP/IBP process in the hierarchy of planning processes was an area that emerged as being critical for 'SA in S&OP'. The vertical linkages to the long-term strategy process and the short-term operations process became an area to investigate further in subsequent rounds.

The benefit of the open ended questions in round 1, to obtain qualitative feedback, was proven by the many valuable insights that were provided that could potentially influence the constructs and relationships of the conceptual framework to more effectively represent how to go about achieving 'SA in S&OP'. In addition the questions attracted more detail as to what is meant by individual elements within the framework. All of these specific areas were used to support the design of the round 2 survey (see appendix 4.3) to enable further investigation of the topics by the entire expert panel.

4.3 Delphi Round 2

Round 2 of the Delphi study was initiated 4 weeks after the completion of round 1. One of the 15 experts from round 1 was forced to pull out of the Delphi study due to personal circumstances. The remaining 14 experts were consistent with those from round 1.

4.3.1 Inputs to Round 2

With consensus achieved on a number of topics in round 1, the focus for the design of the round 2 survey was to pursue the topics identified for further investigation. In line with the progress towards consensus, the structure of the survey in round 2 was more quantitative in

approach versus the previous round, being made up of 21 closed quantitative questions, 6 open ended qualitative questions, 3 demographic capture questions and 1 question to confirm consent.

The research propositions and associated research questions continued to guide the scope of the investigations. Table 4.6 shows the links from the areas for further investigation to the research propositions/questions and the specific questions in the round 2 survey. The full survey is attached in Appendix 4.3. Question 1 (Q1) provided the ethical assurances. Questions Q2-Q6 were demographic questions. Note that the setup of the Qualtrics survey tool was such that some guidelines provided during the survey were labelled as questions by the tool (see note at the end of the table).

Table 4. 6: Linking areas requiring further investigation to the round 2 survey questions

Area requiring further investigation from round 1	Research Propositions (RP) /Research Questions (RQ)	Round 2 Survey Questions
Visibility of Strategy	RP1 / RQ-1(c): What other conditions are important for 'SA in S&OP'?	Q8, Q9, Q21, Q22
Impact of short-term focus	N/A – Emerging insight.	Q10
Role of incentives	RP4 / RQ-4(b): What, if any, other elements should be considered when building the right organisation mindset for 'SA in S&OP'?	Q11, Q12
Broader perspective on 'Drive Executive Education' construct	RP1/RQ-1(a): Which, if not all, of the conditions are important for 'SA in S&OP'?	Q15
Differing interpretations from the respondents on the 'Determine Process Maturity' construct	RP1/RQ-1(a): Which, if not all, of the conditions are important for 'SA in S&OP'?	Q17, Q18, Q19
Input on relative importance of conditions	RP1/RQ-1(a): Which, if not all, of the conditions are important for 'SA in S&OP'?	Q20, Q23
Individual consideration to be investigated by broader panel of:, lead-time for decisions, trust that decision maker has in the S&OP team, clarity of roles and responsibilities, assumptions management, strategic project management.	RP1 / RQ-1(c): What other conditions are important for 'SA in S&OP'? RP2/RQ-2(b): What other processes should be included to achieve 'SA in S&OP'?	Q25, Q26, Q27, Q32, Q34, Q35
Financial Integration positioned strongly plus arose in answers to multiple questions	RP2/RQ-2(b): What other processes should be included to achieve 'SA in S&OP'?	Q29 & Q30

Note: Q1, Q7, Q13, Q14, Q16, Q24, Q28, Q31, Q33, Q36, Q43, while labelled as questions in the Qualtrics Survey tool, were in fact guideline instructions to the respondents (see Appendix 4.3)

In support of capturing data in support of future research into the role of IT, Q37-Q42 explored some specific areas following on from round 1. The data and subsequent analysis are covered in appendix 4.10.

The responses to the questions provided consensus on many of the topics that were being investigated. These are described in the next section, followed by a summary of the topics where more data was required, providing input to round 3.

4.3.2 Consensus from Round 2

Similar to round 1, consensus was identified in a number of areas from both the quantitative and qualitative analysis conducted. The consensus insights resulting from both these analysis approaches are presented in this section.

Insights from quantitative analysis

The quantitative analysis of the closed questions delivered consensus on a number of topics, based on the >75% agreement criterion. These are listed, along with alignment to the research objectives, in Table 4.7.

Table 4. 7: Quantitative Analysis providing Consensus from Round 2

Question No.	Focus	Results	Research Objective
Q8	How Strategy should be represented in S&OP	86% viewed it essential to have: Vision, Mission, Strategic Objectives Strategic Roadmaps Strategic Targets by year	Change to conditions of CF1 to make role of Strategy more explicit in support of RQ-1(c)
Q10	How to address the challenge of the short-term focus	93% identified the need for a separate but linked process	Important consideration for positioning of S&OP in the planning hierarchy in support of SA – New insight
Q11	Practical to structure incentives to encourage SA focus	100% believe it is practical	Incentives as an element of organisation mindset construct in support of RQ-4(b)
Q15	Scope of education focus	93% for Executive Team & S&OP design team	Expand scope of 'Deliver Executive

			Education' construct in support of RQ-1(a)
Q17	Need to understand S&OP maturity up front	93% agreed with need to understand maturity (64% strongly agreed and 29% somewhat agreed)	Providing clarity to "Determine Process Maturity" construct in support of RQ-1(a)
Q18	Need a level of maturity before can achieve SA	86% agreed that a level of maturity is required for SA (43% strongly agreed and 43% somewhat agreed)	Providing clarity to "Determine Process Maturity" construct in support of RQ-1(a)
Q19	Time for a typical S&OP process to mature for SA	86% aligned to a window between 6-18 months (50% - 12months, 25% - 18 months, 14%-6months)	Providing clarity to "Determine Process Maturity" construct in support of RQ-1(a)
Q20	Importance of Conditions*	100% considered all conditions either essential or good to have. (Essential ratings: 100%-Education, 93% business context, 86%-Horizon, 57%-Maturity)	Confirming all conditions important with insignificant relative importance, in support of RQ-1(a)
Q21 & Q22	Should 'Strategic Plan' be added as a condition to CF1	100% agreed it should be added as a condition and that it was essential to do so	Add a new condition construct to framework in support of RQ-1(c)
Q23	If feedback loop invoked which conditions would be re-visited	93% identified feedback to the strategic plan to ensure it was visible and executable.	Add a new condition construct to framework in support of RQ-1(c)
Q25	Stating the lead-time for decisions would enhance opportunity for SA	100% agreement (64% strongly agreed and 36% somewhat agreed)	Include as part of explanation of 'Scenario Planning' construct in support of RQ-2(a)
Q26	Decision Maker has to have confidence in the S&OP team	100% agreement (79% strongly agreed and 21% somewhat agreed)	Include as part of explanation of 'Organisation Mindset' construct in support of RQ-4(b)
Q27	Roles & Responsibilities need to be clearly defined	100% agreement (79% strongly agreed and 21% somewhat agreed)	Include as part of explanation of 'Organisation Mindset' construct in support of RQ-4(b)
Q29	Should financial integration be explicitly called out in the framework	100% agreement that financial integration should be explicitly called out	Add a new enabling process to framework in support of RQ-2(b)
Q32	Strategic assumptions can be important to trigger SA discussions	93% agreement (76% strongly agreed and 14%	Include as part of explanation of 'Scenario Planning' construct in

		agreed)	support of RQ-2(a)
Q35	Importance of tracking strategic projects in support of SA	92% believed it is an enabler (67% essential, 25% Good to Have)	Include as part of 'Strategic Plan' new construct in support of RQ1-(c)

*Note: Where respondents were permitted to select multiple options %'s will total >100%

The consensus demonstrated through the quantitative analysis, provided a richer insight into many of the constructs of CF1 and also suggested changes to constructs.

For the existing CF1 framework, the consensus feedback provided insights to re-evaluate the naming of the conditions. In addressing the research questions of understanding which if not all of the conditions were important (RQ-1a), a broader understanding emerged which challenged the prescriptive approach driven by the verbs in CF1. For example the condition 'Determine Process Maturity' was too restrictive based on the Delphi analysis that indicated not only was it a condition to understand maturity (Q17 response), but also that a level of maturity would have to be established (Q18 response) and this could take 6-18 months before an organisation would be ready for SA (Q19 response). To capture the broader scope in the explanation, the construct was changed to 'Process Maturity'. Similarly for the construct of 'Deliver Executive Education', the responses to Q15 indicated that education would need a wider scope than just the executive team. Along with supporting qualitative analysis (see next section), it was determined that a more appropriate name for the construct was 'Education', allowing for a broader scope included in the explanation. The learnings from this analysis combined with the consensus and analysis from round 1, drove a decision to remove all the verbs from the existing condition constructs of CF1, affording more scope when describing each construct.

The consensus from the analysis also confirmed a new condition construct added to CF1, namely 'Strategic Plan', in support of RQ-1(c). Having been raised as a topic to investigate from round 1, it was unanimously confirmed by the expert panel in round 2 to be explicitly defined as a condition (Q21 & Q22 responses). It was also highlighted as a key focus area when the feedback loop is triggered from the enabling processes back to the conditions (Q23 response). As part of the strategic plan it was deemed essential to track strategic projects (Q35).

As it relates to the enabling processes of CF1, insights were provided in support of the 'Scenario Planning' construct in support of RQ-2(a). The respondents agreed that being clear about decision lead-time was important (Q25 response) and explicitly stating strategic assumptions (Q32 response), as key enablers to triggering decision making, which is the objective of scenario planning. These elements were added as part of the explanation behind the 'Scenario Planning" construct.

An additional enabling process construct was also concluded, in support of RQ-2(b). While the synthesis from the ILR had identified 'Financial Integration' as a key enabling process, it was built into the construct of 'Establish an Integrated Plan' in CF1. The consensus feedback from the expert panel was that it was important enough to be called out explicitly in the framework (Q29 response). Therefore 'Financial Integration' was added as an extra enabling process construct.

With respect to building the required organisation mindset, the expert panel enhanced the understanding of what sits behind the creation of the required mindset. The aspects with strong consensus of leveraging incentives (Q11 response), decision maker having confidence in the team (Q26 response) and being clear on roles & responsibilities (Q27 response), provided guidance in support of the 'organisation mindset' construct in CF1, in support of RQ-4(b).

In terms of the positioning of S&OP in the planning hierarchy, in order to ensure focus was established among the S&OP teams for SA, the expert panel confirmed that a separate but linked process was required for handling the short-term (0-3 month horizon) issues (Q10 response). This drove a consideration of providing another dimension to the conceptual framework that would emphasise the importance of the planning hierarchical positioning of S&OP. This aspect is further discussed as part of the final synthesis later in this chapter (section 4.5).

Insights from qualitative analysis

From the qualitative analysis conducted, further insights were captured to influence the structure and content of CF1. Even though there were less qualitative open questions in the round 2 survey, the NVIVO tool was again deployed to support efficient and transparent analysis.

Table 4. 8: Qualitative Analysis supporting Consensus from Round 2

Question No.	Focus	Results	Research Objective
Q12	Reasons why incentives can support SA in S&OP	Multiple comments related to leveraging incentives to drive the right priorities and behaviours	How to build required organisation mindset in support of RQ-4(b)
Q30	Understanding Financial Integration	Convergence of comments related to having one integrated plan including aligned financial targets and projections.	Building understanding of 'Financial Integration' as an explicit construct in support of RQ-2(b)

The most prominent feedback to Q12 related to encouraging the right priorities/behaviours. Such responses, while prominent, were quite generic and not specifically related to SA. However, they did indicate that incentives be considered as part of the factors to encourage the development of the organisation mindset, oriented for SA.

With the emergence of 'Financial Integration' as an explicit enabling process construct, the qualitative feedback provided insights as to what this entails in practice. The profile of responses is shown in Figure 4.4.

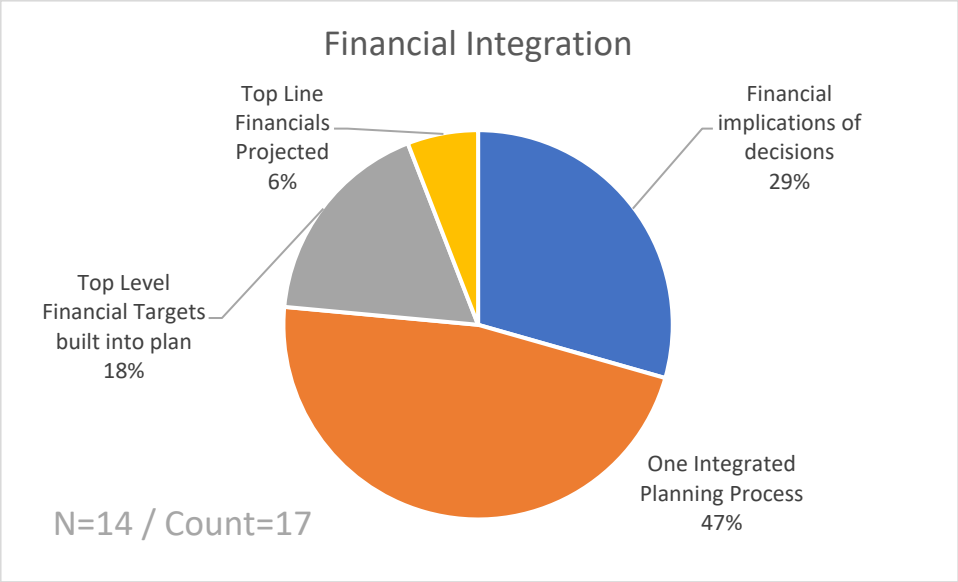


Figure 4. 4: Explaining Financial Integration

As shown in Figure 4.4, the requirement is to have one integrated plan for the business, that has the key financial targets built in and financials are projected out over the S&OP horizon. In addition, when scenarios are brought forward for decision making, the financial implications need stating. Following are a sample of the quotes in support of the analysis:

- *"Decision making with all financial aspects & considerations"* – CT3
- *"All plans need to be fully costed. One set of numbers, all coming from the same source, incl. Financial plans"* – PF1
- *"FI [Financial Integration] means that top line revenue is projected over 24-36 months having been created from the top-down. It includes all aspects of financial performance – Revenue, Margin, COGs, Inventory, Cash Flow, Capex etc.*" – DM1

The round 2 analysis delivered consensus across a range of topics. However, there were still some aspects that required further investigation.

4.3.3 Areas requiring further investigation from Round 2

The topics that prompted further investigation following the round 2 analysis are listed in Table 4.9 and subsequently explained. Each of these topics directly influenced the design of the round 3 survey.

Table 4. 9: Areas for further investigation from Round 2 Analysis

Ref No.	Question	Focus	Insight for further investigation	Research Objective
1	Q12	How incentives can support SA	If going to leverage incentives then how measure when SA is being achieved?	Other considerations for Conditions, Enabling Processes or Organisation Mindset as per RQ-1(c), RQ-2(b), RQ-4(b)
2	Q19	Level of maturity required for SA	With time to maturity ranging from 6-18months, what factors influence the time to maturity?	Building understanding of 'Process Maturity' construct as per RQ-1(a)

3	Q9	Making strategy visible in S&OP	When changes are required to the strategic plan, how often would a review of the strategy be required?	Other considerations for Conditions, Enabling Processes or Organisation Mindset as per RQ-1(c), RQ-2(b), RQ-4(b)
4	Q34	Where to review Strategic Projects	Beyond the S&OP reviews, how is link formed to the Strategy Management Review (SMR)?	Other considerations for Conditions, Enabling Processes or Organisation Mindset as per RQ-1(c), RQ-2(b), RQ-4(b)

1. The findings related to the role of incentives showed that one respondent highlighted that it is difficult to measure SA:

   "SA and IBP success is difficult to measure, which, is a key criteria for successful incentivisation" – CT1.

   Linking back to the analysis from round 1, the examples provided of typical decisions in S&OP, in response to Q7a, showed that many of the decisions would require SA to have been achieved (see Figure 4.7 in Round 1 analysis). This aspect was identified for round 3 to get the opinions of the expert panel on tracking the occurrences of strategic decision making as an effective indicator that SA had been achieved.

2. As it related to understanding the role of process maturity for SA, it was confirmed that it would take time for organisations to mature to the stage that they are ready to engage SA (range from 6-18 months as shown in response to Q19 with 12 months reflecting experience of 50% of respondents – see Table 4.7). Recognising the differing experiences across the expert panel, further investigation was merited to understand what factors would influence the time to maturity. Also, if SA was not being achieved, would a maturity assessment help target the focus of attention to accelerate towards maturity.
3. In response to Q9, when asked for other aspects important to ensure the strategy is visible in S&OP, many of the findings aligned with topics already raised through previous questions/rounds. Effective communications and having clear accountabilities emerged prominently again from the qualitative narrative:

   "A clearly defined communication process" – DM4

"Strategic Plan and targets have been established, communicated and understood by all leadership levels within the organisation" – PF3.

"Accountabilities clearly differentiated and assigned" – CT3.

"Ensure alignment of WHO is accountable and responsible for each of the strategic activities" – PF4.

However, an aspect to be further investigated was identified, when a few of the respondents pointed to the need to have a link to the strategy management process with a view to adjusting the strategic goals if necessary:

"Regular reviews of the roadmap and yearly targets to ensure progress is being achieved and eventual need to adjust targets" – DM3.

"External factors such as increased regulatory compliance, market entry changes etc." – DM1.

The interesting aspect of these comments was the implication that the strategy and associated strategic plan were not fixed and could be adjusted if the latest S&OP plans mandated a change. This triggered a reflection back to the models of S&OP researched as part of the ILR (Thomé et al., 2012b, Tuomikangas and Kaipia, 2014). In these S&OP models, they show a direct link to the business strategy, but position it as one directional in terms of the strategy providing top-down direction only. Also in the round 1 qualitative feedback there were multiple references to maintaining the link with the strategy. A couple of quotes from the round 1 analysis show this:

"A S&OP/IBP process is designed to form a "bridge" between the strategy and the tactical and operational implementation. If that bridge is not in place there is a higher probability that business implementation will not be aligned with the strategy" – CT1.

"IBP can provide a feedback loop on the strategic direction and enables the organization to adapt and develop the strategy to the changing business needs. This can improve the strategic decision making ability of the organization" – PF2.

In order to provide a better understanding of what this link entails then this was a topic identified for further investigation in round 3.

4. On the subject of the link to strategy, the Strategy Management Review (SMR) was identified as a supporting review where strategic projects are tracked (Q34). Having confirmed this was an important enabler for SA (as shown in the quantitative consensus

in section 4.3.2), Figure 4.5 shows the respondents views as to where the strategic projects should be reviewed.

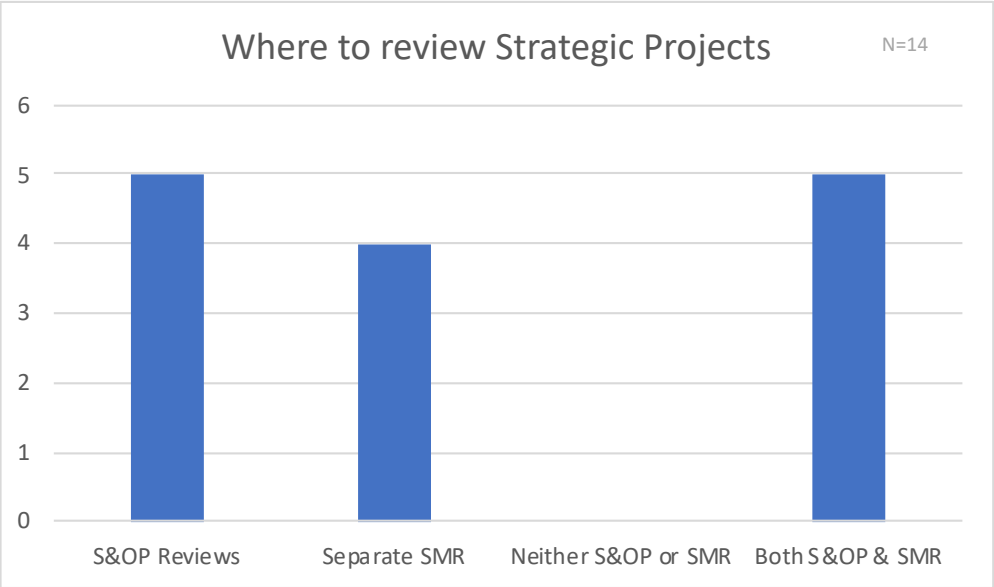


Figure 4. 5: Response profile from Q34 of where strategic projects should be reviewed

It shows that while 71% believed they should be reviewed in the S&OP reviews or both the S&OP and SMR, 29% viewed they should only be reviewed in the Strategy Management Review (SMR). With the linkage to the strategy process emerging as an important theme from round 1 and round 2, the SMR linkage was a topic that was further investigated in round 3.

4.3.4 Summary Outcomes from Round 2

The significant outcomes from the round 2 analysis brought forward new considerations for the conceptual framework, CF1. In terms of the overall structure of the conceptual framework the expert panel agreed on the requirement to add the strategic plan as one of the condition constructs, such that it is visible in the process, through defining clear goals per year as well as defining the vision, mission and strategic objectives. By structuring the strategic plan in this way it provides a mechanism for the SA enabling processes within S&OP to align to the strategy. Interestingly the absolute necessity of the presence of the strategic plan was further reinforced when the panel suggested that if the SA enabling processes were not capable of delivering SA, then the feedback loop would typically challenge the strategic plan and how it

was structured. The addition of the 'Strategic Plan' as a condition was a significant response to the RQ-1(c).

Another suggested change to the structure of the conceptual framework was emphasised through the multiple references to financial integration in round 1 which was confirmed in round 2 by the expert panel, suggesting that this aspect was important enough to be explicitly stated in the framework. So while it was implied and part of the description of achieving an integrated plan in the initial framework, 'financial integration' was made explicit as one of the enabling processes constructs, in support of RQ-2(b).

A number of consensus agreements in round 2 also provided broader explanations for many of the constructs of CF1. In the cases of *education* and *maturity* it opened up a broader scope consideration which also triggered a reflection on all the condition constructs to remove the verbs, avoiding unnecessarily prescriptive and therefore restrictive constructs. These were significant findings in support of RQ-1(a). With respect to the enabling processes constructs of CF1, consensus on the importance of explicit strategic assumptions and highlighting the decision lead-time supported understanding of the 'Scenario Planning' construct, in response to RQ-2(a). The intangible construct of 'organisation mindset' was further enhanced through consensus being reached on the importance of incentives, having a trusted S&OP team and understanding roles & responsibilities, in support of RQ-4(b).

The positioning of the S&OP process in the planning hierarchy was further reinforced with the conclusion that a separate but linked short-term process was required for handling the 0-3 month horizon issues. Before conclusions were drawn on how to represent this in terms of the framework, the other planning hierarchy link to the strategy process was investigated in round 3.

On conclusion of round 2 the findings brought consensus across many of the topics guided by the Research Propositions (RPs) and associated Research Questions (RQs). In order to visualise the evolving impact to CF1, as a result of the consensus reached, an interim conceptual framework was constructed to reflect the suggested improvements to that point. This interim framework is shown in Figure 4.6. By providing this to the expert group, it served as an artefact to allow them to reflect on their consensus position, before engaging with the round 3 survey.

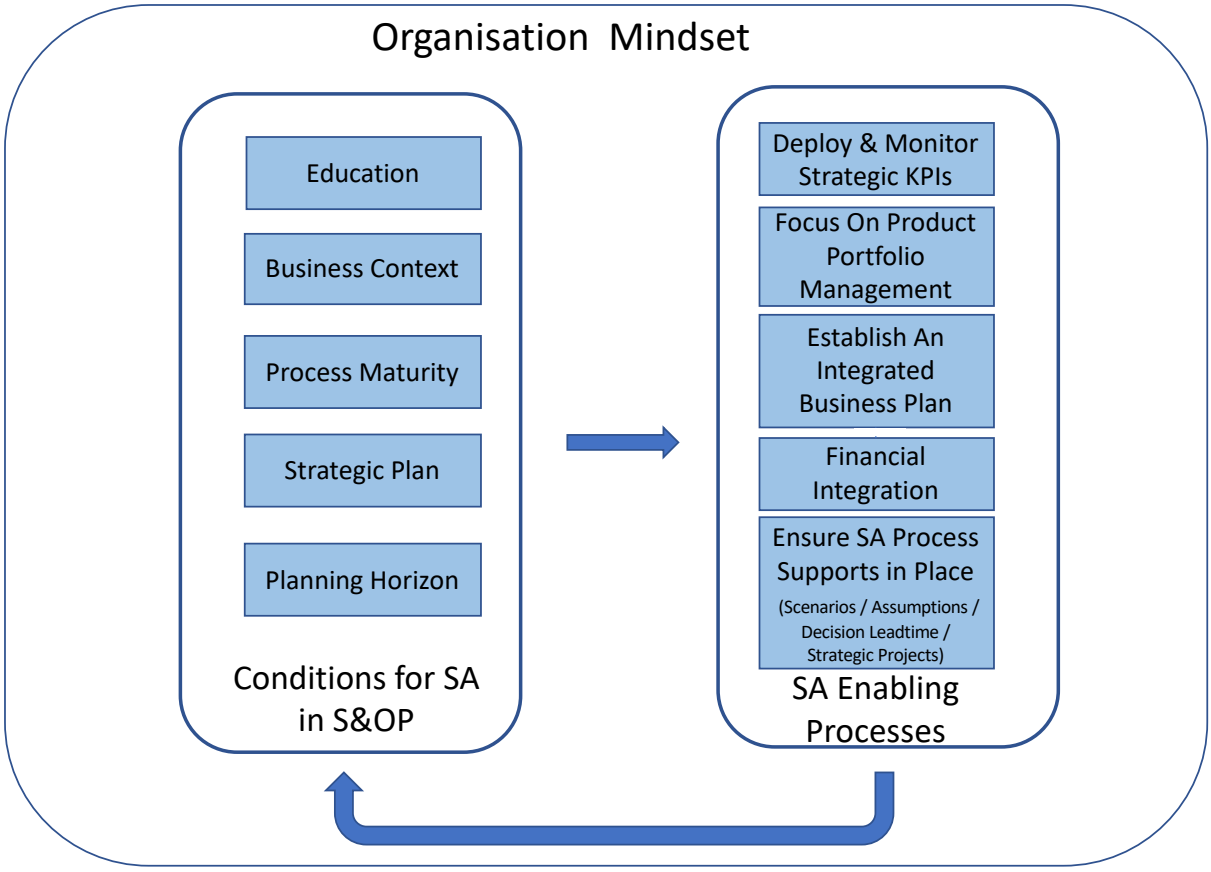


Figure 4. 6: Interim conceptual framework following round 2.

As shown in Figure 4.6, based on strong inputs on a number of supporting elements associated with scenario planning, they were made explicit by changing the 'Implement Scenario Planning' construct of CF1 to 'Ensure SA Process Supports in Place'. This was designed to reassure the respondents that their contributions had been captured. However, as it relates to the final structure of the conceptual framework, some of these elements were positioned as part of the descriptive narrative, supporting key constructs, in the final synthesis of the Delphi study (see CF3 in section 4.5).

4.4 Delphi Round 3

Round 3 of the Delphi study was initiated 4 weeks after the completion of round 2. All 14 experts from round 2 participated in round 3 and therefore there was 0% attrition.

4.4.1 Inputs to Round 3

As stated, the interim conceptual framework, following the level of consensus received in round 2, was provided to the expert panel along with explanations of the changes made (Appendix 4.5). The survey for round 3 (Appendix 4.4) was made up of 4 open ended qualitative questions, 5 closed quantitative questions, 4 demographic capture questions and 1 question to confirm consent. The survey sought to get consensus on the interim framework as well as targeting the areas where further investigation was identified from round 2. Table 4.10 provides the link between the areas for further investigation and the round 3 survey questions. Question 1 (Q1) provided the ethical background reassurance. The next set of questions (Q2-Q5) provided demographic information. Note that the setup of the Qualtrics survey tool was such that some guidelines provided during the survey were labelled as questions by the tool (see note at the end of the table).

Table 4. 10: Linking areas requiring further investigation to the round 3 survey questions

Area requiring further investigation from round 2	Research Propositions (RP) /Research Questions (RQ)	Round 3 Survey Questions
Alignment on interim framework as a true reflection of consensus from rounds 1 and 2	RPs 1-4 & RQs 1-4	Q8 & Q9
Options for measuring the achievement of SA	RP4 / RQ-4(b): What, if any, other elements should be considered when building the right organisation mindset for 'SA in S&OP'?	Q10 & Q11
Factors that influence time to maturity	RP1 / RQ-1(a): Which, if not all, of the conditions are important for 'SA in S&OP'?	Q13
Importance of conducting a maturity assessment if SA is not being achieved	RP3 / RQ-3(a): How important and why is it important to have a closed loop feedback process from the SA enabling processes back to the conditions for SA?	Q16 & Q17
How links are made from S&OP to SMR	RP4 / RQ-4(b): What, if any, other elements should be considered when building the right organisation mindset for 'SA in S&OP'?	Q19 & Q20

Note: Q1, Q6, Q7, Q12, Q15, Q18, Q21, while labelled as questions in the Qualtrics Survey tool, were in fact guideline instructions to the respondents. Also, there was no Q14. (see Appendix 4.4)

The responses to the questions provided consensus on the final outstanding items and so round 3 was the final round of the Delphi study.

4.4.2 Consensus from Round 3

Round 3 was the final round of the Delphi study with the objective met of achieving consensus on the key outstanding topics. As per previous rounds both quantitative and qualitative analysis resulted in key insights, as presented in this section.

Insights from quantitative analysis

From the quantitative analysis conducted, Table 4.11 captures the topics where consensus was reached.

Table 4. 11: Quantitative Analysis providing Consensus from Round 3

Question No.	Focus	Results	Research Objective
Q8	Level of agreement on interim framework.	100% agreement (79% strongly agree and 21% somewhat agreed)	Inputs to CF1 in support of RQ1-4.
Q10	How best to measure when SA is achieved	57% selected tracking number of strategic decisions made*	Update to CF1 in support of RQ-4(b)
Q16	If SA not being achieved would it be important to assess maturity	100% agreement (86% strongly agree and 14% somewhat agreed)	Insight to support understanding of how feedback loop could be triggered in support of RQ-3(a)
Q19	SMR linked to S&OP through the leadership team attending both	86% agreement (57% strongly agreed and 29% somewhat agreed)	New construct consideration in support of RQ-2(b) and RQ-4(b)
Q20	Frequency of a SMR	50% suggest quarterly* with next prominent input being annually (36%)	New construct consideration in support of RQ-2(b) and RQ-4(b)

Note: * - Consensus below target of 75% but within the range of 50%-97% typically accepted (Drumm et al., 2022).

The quantitative analysis confirmed the consolidated position reflected by the interim framework following the first two rounds of the study (Q8 responses). In addition the analysis brought forward some new construct elements to consider as part of the final

synthesis. The responses to Q10 in support of RQ-4(b) closed out on a theme through the rounds to add a performance measure to confirm when 'SA in S&OP' is being achieved. The tracking of strategic decisions made was the most prominent input provided. The consensus of 50% was deemed sufficient at this stage of the research to include the extra performance measure construct into the framework, recognising that it would be investigated further in the next stage of the research – the Case Study (Chapter 6). The consensus on the linkage to the SMR through the presence of the leadership team and the quarterly frequency of same (Q19 and Q20) also pointed to the need to reflect the position of the S&OP process within the planning hierarchy, as an important consideration for 'SA in S&OP'. The presence and frequency of the SMR was also identified as an area to be further investigated in the Case Study.

Further understanding was provided on the feedback loop construct of the framework, through the responses to Q16, which confirmed that a maturity assessment was a key method to provide feedback when re-visiting the conditions, should an organisation be struggling to achieve SA. This provided further input in support of RQ-3(a).

Insights from qualitative analysis

The analysis of the qualitative feedback provided more information to support the descriptions of the constructs, as summarised in Table 4.12.

Table 4. 12: Qualitative Analysis supporting Consensus from Round 3

Question No.	Focus	Results	Research Objective
Q9	Any other constructs to be considered beyond what shown in the interim framework?	2 X respondents added qualitative feedback that reinforced the existing constructs.	Inputs to CF1 in support of RQ1-4.
Q13	Factors to accelerate time to maturity	Top 4 factors related to existing condition constructs	Confirming the condition constructs of CF1, in support of RQ-1(a)
Q17	Why important to conduct maturity assessment if not achieving SA	Majority of comments related to being able to identify the gaps	Insight to support understanding of how feedback loop could be triggered in support of RQ-3(a)

When the expert panel were afforded the opportunity to consider any other constructs missing from the interim framework (Q9), the comments provided by 2 respondents just reinforced the existing constructs. A couple of quotes demonstrate this:

"Perhaps already covered implicitly, but my experience indicates unless there is leadership commitment and discipline to follow and adhere to the process and use it also to support decision making, the process can become formulaic and disconnected from where the 'real' decisions are taken." – DM7

"I believe that communication, and setting of expectation, are an important condition for SA in S&OP. What I mean is that it has to be clear, to the organisation, that having a Strategy is important to the organisation, and that the executive team expect it to be understood, and consistently used as a guiding framework throughout the business." – CT1.

The quote from one of the decision makers (DM7) reinforces the 'Leadership Commitment' element of the 'Organisation Mindset' construct. The consultant (CT1) quote reinforces the importance of the 'Strategic Plan' construct which was one of the key enhancements in the interim framework, relative to CF1.

Interestingly, when the expert panel were asked an open question on what factors determine how quickly SA can be achieved, the response narratives pointed to key constructs in the interim framework. The findings indicate that the factors that help accelerate the time to achieve SA, reinforce the constructs of the interim framework, with the top four factors aligned to four of the five condition constructs, in support of RQ-1(a).

(i) Education and commitment of leadership: Education of the leadership team and a demonstrated commitment to the process can accelerate maturity.

"Executive education and specifically their understanding on how S&OP permeates all levels of the organisation" – PF3.

"Discipline and leadership commitment to the process" – DM7.

(ii) Strategic Roadmap: Making sure that the strategy is visible in the process through the strategic roadmap.

"Clarity of the strategic roadmap and the ownership of each element" – CT3.

"Quality of the Strategy plan (is it detailed enough to be used in the IBP?) – PF5.

(iii) Long-term horizon focus: Ensuring organisation is oriented towards a long-term focus.

"Long-term focus" – DM3.

"Ability of the IBP owner to guide the organization in focusing on mid- / long- term issues" – PF5.

(iv) Maturity: Ensuring the organisation have achieved a level of maturity.

"Process maturity" – DM2.

"The actual maturity of the S & OP process" – PF3.

Having agreed on the role of maturity assessments if SA in not being achieved, the expert panel were asked to give the reasons why (Q17). The responses pointed to the identification of gaps in support of prioritising the areas to be addressed.

"Only by assessing the maturity of the process can you truly identify and address the gaps to achieving SA" – PF1.

"Walk before running - maturity reflects the priorities of what needs to be achieved before gaining value of activities on higher maturity" – CT3.

"The S&OP/IBP is a key process to achieve SA. If SA is not being achieved, if one is not getting closer to it, the S&OP process [maturity] must be revisited" – DM3.

The findings provided further insight into the linkage created by the feedback loop from the enabling processes back to the conditions, in support of RQ-3(a).

The consensus in round 3 confirmed that the interim framework provided an enhanced perspective on how to go about achieving 'SA in S&OP'. The supporting qualitative inputs provided further clarity and understanding to the elements within the conceptual framework. The need to perform maturity assessments was further enhanced confirming that not only up front but also as part of the feedback process, an assessment of maturity would be required, indicating that this is a key mechanism to determine what actions are required to build the capability of the enabling processes to achieve SA. A further support to the conditions defined was provided when the top 4 areas of focus to drive maturity for SA were aligned to 4 of the 5 conditions.

4.4.3 Summary Outcomes from Round 3

The significant outcome from round 3 was the strong consensus achieved for the interim conceptual framework. In addition to the direct responses supporting the interim framework provided, other data gathered when questioned about the role of maturity and how to accelerate maturity, further reinforced the support for the interim framework. When asked specifically if there was something to add, twelve of the fourteen respondents either had no comment to make or explicitly stated that everything was included and the two qualitative comments received were relatable back to the interim framework. Therefore the consensus acknowledged the feedback from rounds 1 and 2 had been reflected appropriately, in support of addressing the research questions (RQ 1-4).

As an enhancement consideration to the interim framework, a key thread from the data analysed from rounds 1 and 2, when presented in round 3 to the expert panel, confirmed a strong view that strategic decision making should be used to indicate that SA has been achieved. This provided a valuable insight into a mechanism that could be used to structure the incentives and create a mindset in the organisation that is focused on SA. This insight triggered a change to the interim framework, to integrate in the performance measurement aspect (see next section 4.5).

In round 2 it was identified that a key linkage was required between S&OP and a separate process for managing the short-term. In round 3 the importance of the positioning of S&OP in the planning hierarchy was further emphasised in terms of the linkage to the strategic management process through the SMR (Strategy Management Review), with the leadership team being directly involved in both the S&OP and the SMR in support of the linkage. This was factored into the final synthesis to determine how best to represent the planning hierarchy dimension (see section 4.5).

4.5 Final Synthesis from the Delphi Study

The Delphi study provided a unique opportunity to acquire the expert inputs from a group of practitioners with extensive experience in S&OP/IBP. Through the structured Delphi methodology, even though all the experts remained anonymous to each other, by providing their own inputs and reflecting on the inputs of others through the rounds, a consensus position was reached on a range of important topics. The insights provided through the

consensus process supported many enhancements to the conceptual framework (CF1) that emerged from the Integrative Literature Review (ILR).

The core structure of the evolved conceptual framework following the Delphi study, labelled CF2, is shown in Figure 4.7, highlighting where key structural changes to the model were made (green highlighted areas), relative to CF1.

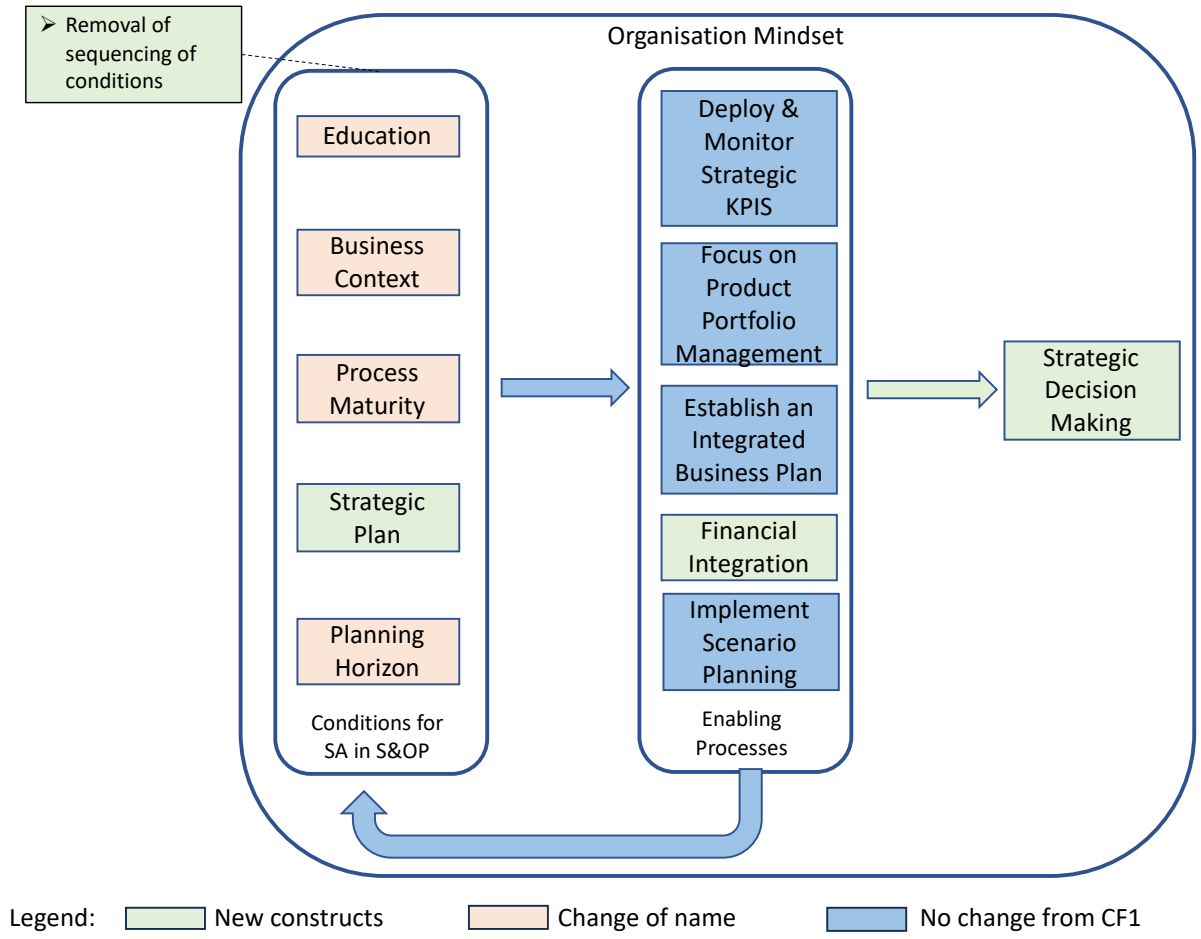


Figure 4. 7: Conceptual Framework CF2 highlighting structural changes from CF1

The highlighted areas (in green) show the critical addition of the 'Strategic Plan' to the up-front conditions as well as the strong input to explicitly call out 'Financial Integration' as an enabling process. A significant structural addition to the framework is reflected in positioning 'Strategic Decision Making' as a key indicator of SA achievement. The removal of the sequencing of the conditions that were part of CF1, is reflective of the spread of perspectives provided by the expert panel as to what the sequence might be, indicating that it would

depend on the particular company situation and so not appropriate to be prescriptive about it in the framework.

While 'Scenario Planning' was part of the CF1 framework it was changed to 'SA supporting processes' in the interim framework after the round 2 data analysis. This change was to ensure the respondents had a full appreciation for the scope of this element which included 'Scenarios', 'Assumptions', 'Decision Leadtime', and 'Strategic Projects'. In the final analysis 'Strategic Projects' was positioned as an explicit part of the 'Strategic Plan' condition, reflecting the importance of strategic projects when defining how to achieve the desired future state. Reflecting on 'Assumptions' and 'Decision Leadtime' as being key components of 'Scenario Planning', the final framework (CF2) reverted to calling out the overarching topic of 'Scenario Planning' as a response variable.

A significant contribution from the expert inputs through the Delphi study was to provide supporting detail as to the key elements that sit behind the key structural elements of the conceptual framework. A summary of these elements are shown in Figure 4.8.

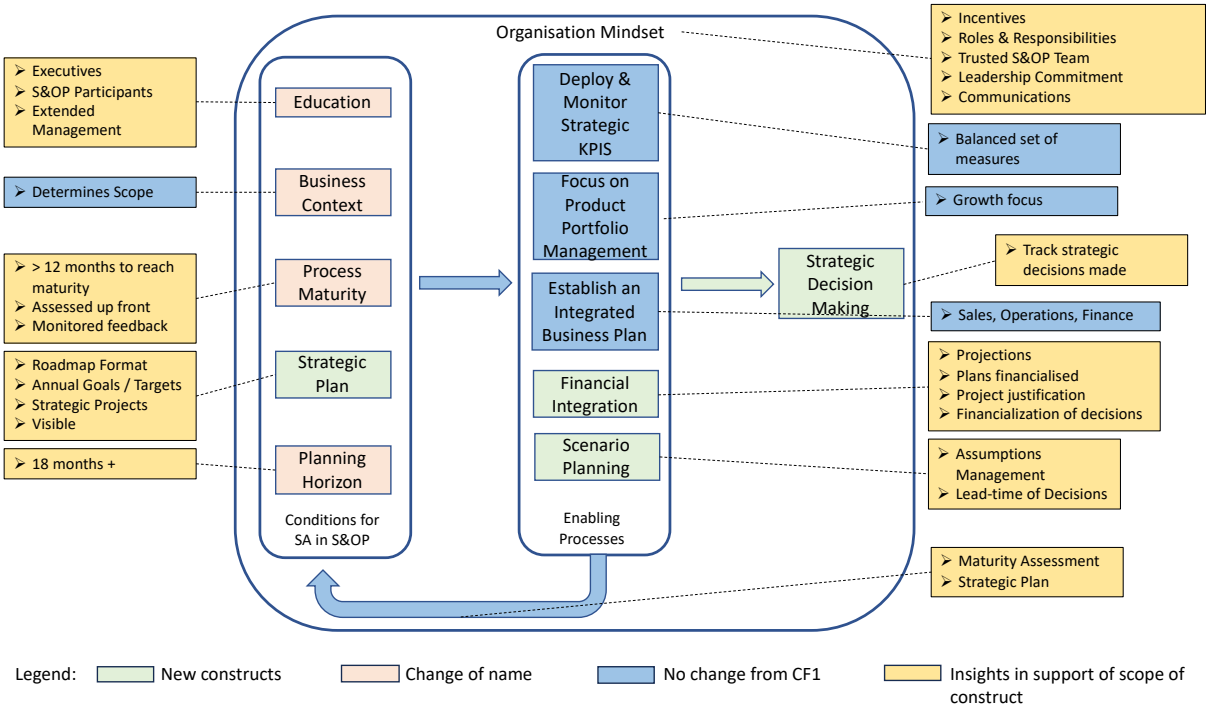


Figure 4. 8: Conceptual Framework CF2 showing content contributions from Delphi study

These contributions provide significant knowledge in support of investigating how the conceptual framework would be deployed in practice.

- The 'Education' condition was expanded to ensure all participants in the S&OP process were covered as a well as the extended management team across the business.
- Business context informs the scope of the S&OP process and positioning of SA (as per ILR findings).
- An understanding of process maturity highlighted the requirement for assessment to determine key actions to be taken, as well as achieving a level of maturity, typically taking over 12 months, to be ready to engage 'SA in S&OP'.
- The strategic plan addition was described as converting the business strategy into a tangible plan with annual goals and projects that are visible within the S&OP review meetings.
- The general consensus is that to engage 'SA in S&OP' the planning horizon of focus needs at least 18 months of a window.
- Having a process in support of a balanced set of strategic KPIs was considered an important enabling process (as per ILR findings).
- The focus on product portfolio management is key to bringing a growth focus to the organisation (as per ILR findings).
- Having an integrated plan means ensuring full alignment between the operations plan, the sales plan and the financial plans in particular (as per ILR findings).
- Financial integration was considered fundamental for SA and the associated processes include a capability to project the financials over the planning horizon, all plans contain the financials as well as the volumes, financial justification to accompany any project requests and the financial impact defined for any proposed decisions.
- In support of scenario planning, explicitly stating strategic assumptions and understanding the lead-time associated with addressing the issue at hand, were considered important elements.
- In building an organisation mindset oriented for 'SA in S&OP', building an aligned set of incentives was considered important. From the S&OP team perspective it is considered important to ensure that the roles and responsibilities are defined and that the ultimate decision makers have confidence in the S&OP team. To drive the right behaviours it is

important that leadership show strong commitment and communicate regularly on the importance of SA.

- The feedback process from the enabling processes to the conditions was considered essential and while the feedback may trigger a review of any of the conditions, the experience of the experts indicated that in particular it would be directed towards the positioning of the strategic plan or having to revisit the maturity assessment as a means to determine the best actions to be taken. Of course such an assessment in turn could cause a revisiting of all of the conditions to increase the capability of the process.

In addition to the key concepts in support of 'SA in S&OP', the Delphi findings provided a perspective on the linkages between the S&OP process, the Strategy Management Process and the Operations Management Process, in order to optimise the opportunity for 'SA in S&OP'. The relationships described by the experts is summarised in Figure 4.9.

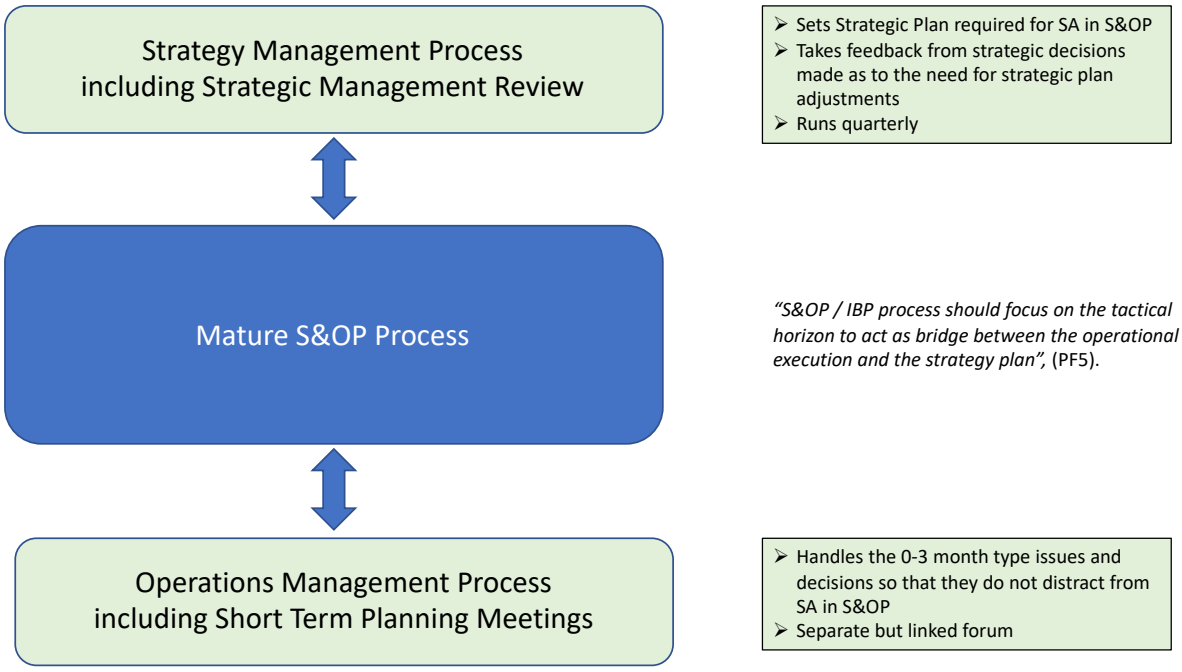


Figure 4. 9: Positioning of S&OP in the Planning Hierarchy to support SA

The inputs from the expert panel confirmed that in order to focus attention on the longer-term issues in the S&OP meetings that a separate short-term process should be in place to handle the 0-3 months horizon issues, as part of the operations management process. Also, feedback

from the latest short-term plans can feed into the S&OP process to understand potential implications to the longer-term S&OP plans.

With the emphasis on having a visible strategic plan as one of the conditions in the conceptual framework, the experts stressed the importance of keeping this strategic plan up to date by ensuring there was a strong linkage from S&OP to the strategy management process and specifically the Strategy Management Review (SMR). With the S&OP providing the latest perspective on future business projections, these need to feed into the SMR for consideration and if appropriate would trigger changes to the strategic plan. Hence the two way arrow in Figure 4.9.

4.6 Conclusions

Reflecting on the RPs and RQs that formulated the design of the Delphi surveys, the results enable conclusions to be made. These conclusions are captured in Table 4.13.

Table 4. 13: Reflecting on Delphi Research Propositions and Research Questions

Propositions (from CF1)	**Research Questions (from CF1)**	**Conclusions (from CF2)**
1. To achieve 'SA in S&OP' the following conditions are required and in the following sequence: Determine process maturity -> Understand the business context -> Deliver executive education -> Extend the planning horizon	1(a): Which, if not all, of the conditions are important for 'SA in S&OP'? 1(b): Does the proposed sequence of the conditions hold in practice or do other sequences emerge? 1(c): What other conditions are important for 'SA in S&OP'?	1(a): They are all important. 1(b): No – sequencing can be different depending on specific instance. 1(c): Having a 'Strategic Plan' considered to be an essential.
2. The following processes are fundamental to implementing 'SA in S&OP': Deploy and monitor strategic KPIs / Focus on product portfolio management / Implement	2(a): Which, if not all, of the SA processes are valid to achieve 'SA in S&OP'? 2(b) What other processes should be included to achieve 'SA in	2(a): They are all valid. 2(b): 'Financial Integration' regarded as an enabling process that should be explicitly called

scenario planning / Establish an integrated business plan	S&OP'? 2(c) What, if any, is a logical sequence to implementing the SA enabling processes?	out in the framework. 2(c): No logical sequence for the enabling processes.
3. The introduction of an iterative process with closed loop feedback from the SA processes to the conditions, supports embedding 'SA in S&OP'.	3(a): How important and why is it important to have a closed loop feedback process from the SA enabling processes back to the conditions for SA?	3(a): Feedback process considered to be very important to provide feedback on process maturity and content of the strategic plan in particular.
4. The collective conditions and enabling processes, setup in a closed loop feedback manner, are key to achieving an engaged organisation mindset for achieving 'SA in S&OP'.	4(a): How and why is it important to have a closed loop process to deliver the right organisation mindset for 'SA in S&OP'? 4(b): What, if any, other elements should be considered when building the right organisation mindset for 'SA in S&OP'?	4(a): Without the right organisation mindset SA will not be achieved. 4(b): Key elements identified to have a trusted S&OP team, leadership commitment, roles and responsibilities defined, effective communications and aligned incentives.

In line with the abductive approach to the Delphi, the feedback from the expert panel supported two other significant conclusions:

⇒ Strategic Decision Making when positioned as an output in CF2, provides a mechanism to track when SA is achieved.

⇒ Making sure the S&OP process is formally positioned within the traditional planning hierarchy is an important enabler to achieving SA.

As a final confirmation of consensus on the findings by the expert panel, a report was issued to the entire panel of experts, providing an explanation for the final CF2 framework and also providing a summary of the major areas of feedback across the three rounds. A copy of this report is shown in Appendix 4.9.

The critical realism research philosophy was central to ensuring that key topics were identified from the qualitative feedback and positioned for further investigation through the

rounds. In conclusion, the RQs were addressed by the Delphi study and the conclusions supported an evolution of the framework in terms of structure and content.

4.7 Topics for Future Research captured during the Delphi Study

One major topic that is positioned for future research is that of the role of IT in supporting 'SA in S&OP'. This topic emerged from the ILR as an element of the 'Maturity' construct and was considered as requiring a research focus of its own. However, recognising it was a unique opportunity to get a panel of experts on S&OP together for the study, some questions were positioned in round 1 and subsequently in round 2 of the Delphi study, with the intention of gathering empirical data as part of creating a foundation for future research into the role of IT in enabling 'SA in S&OP'. The data and analysis associated with this topic are described separately in Appendix 4.10.

Another topic relates to process maturity. There was a lot of investigation from rounds 1 to 3 that brought a deeper understanding of the importance of having a level of maturity built up over a period of time (6-18 months typically). It raises a question as to how robust the various maturity models are that currently exist in the literature and how they may need adjusting to factor in what's required to achieve 'SA in S&OP'. The ILR surfaced a number of the existing maturity models (Thomé et al., 2012b, Danese et al., 2018) and an interesting topic for future research would be to examine these models in the light of the findings from the Delphi study.

The demographics data captured as part of the Delphi study did not indicate any relevant findings that were tied to a specific demographic profile. This may not be so surprising when considering the subject of the research being 'SA in S&OP'. One could argue that regardless of the environment that an S&OP process is operating in, the challenges an organisation would face to enable SA would be the same. Certainly there were no significant patterns in the demographic profiles that restricted the consensus findings. Having said that, the industry profile in particular was relatively narrow and future research could take the resulting conceptual framework and investigate its efficacy across a broader industry sector.

In terms of the overall research study, with a case study being part of the research journey, a couple of specific areas from the Delphi study were investigated during the case study to confirm the conclusions made:

⇒ The conclusion to add the tracking of 'Strategic Decisions Made' construct as part of a performance indicator in CF2, was based on a 57% consensus from the expert panel. A further 14% (2 respondents) selected the category of tracking the number of strategic plan challenges that are escalated and 7% (1 respondent) selected tracking the number of times the strategic assumptions are changed. Of the 21% (3 respondents) who selected 'Other' some of the suggestions are captured in the following quotes:

"One measure doesn't cover it adequately." – DM7

"A good way to measure whether SA is being achieved within S&OP/IBP would be a two-level approach: Level 1: Measure how many of the strategic initiatives planned in the Strategy are being pulled in the IBP process and kicked-off on time Level 2: Measure whether the strategic initiatives kicked-off are completed on time." – PF5

"If you only measure 'Strategic Decisions' the number may be low and may not move some months. Looking at other decisions that align with [or don't] the strategic plan, gives you a sense if you are becoming misaligned to the overall strategic direction." – DM5

The design of the case study was guided by the research questions and propositions reflecting the findings from the Delphi. Therefore, the researcher was able to observe the efficacy of tracking 'Strategic Decisions Made' as an indicator of 'SA in S&OP' being achieved (see Chapter 6).

⇒ In terms of the link to the Strategic Management Review (SMR), a consensus of 50% suggested a quarterly frequency for this review. The full profile of responses is shown in Figure 4.10:

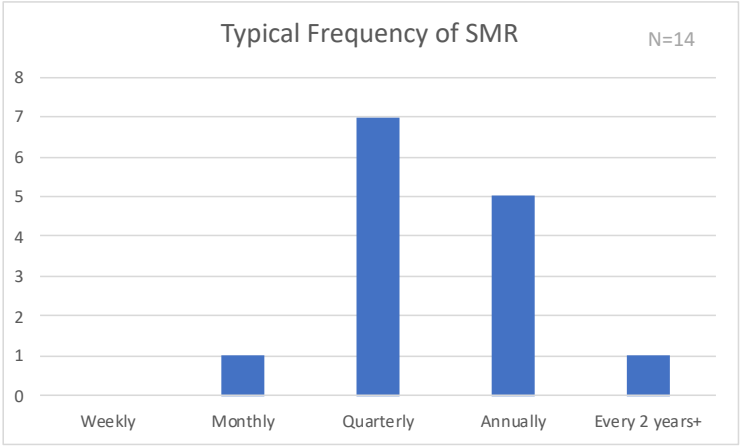


Figure 4. 10: Profile of responses on frequency of SMR

The case study afforded the opportunity to observe how frequently the SMR was run to ensure linkages were maintained to the S&OP process (see Chapter 6).

Beyond what is addressed through the case study a full listing of areas identified for future research across the whole study is covered in Chapter 7 (section 7.4).

4.8 Summary

In this chapter the Delphi study rounds and associated analysis are described in detail. The objectives were fulfilled in obtaining empirical data from the field to enhance the conceptual framework (CF1) resulting from the Integrative Literature Review (ILR). The research philosophy of critical realism was instrumental when interpreting the qualitative feedback between the rounds and deciding on the topics for further investigation. The expert inputs drove some changes to the structure of the conceptual framework as well as providing a rich contribution to describe the various constructs. In addition, the positioning of the S&OP process, as providing a key linkage between the long-term strategy management process and the short-term operations management process, was established as a key enabler to achieving 'SA in S&OP'. The next stage of the research was to investigate potential theories that could provide a lens to explore CF2 to determine if what was emerging could be grounded in proven theory (or theories). This is the subject of the next chapter.

CHAPTER 5: THEORETICAL PERSPECTIVES

5.0 Introduction

Having completed the field Delphi study, attention returned to the literature to explore theories that could potentially elucidate the evolving conceptual framework (CF2). With Strategic Alignment (SA) in Sales and Operations Planning (S&OP) as an emerging phenomenon in the literature, the initial framework (CF1), from the Integrative Literature Review (ILR), was greatly enhanced with the consensus Delphi process, engaged by the panel of experts. The next step in the research journey was an investigation through theoretical lenses to determine how academic research could further contribute to addressing the ultimate research objective of understanding the factors that contribute to achieving 'SA in S&OP'.

In this chapter it is demonstrated how three theory lenses provided valuable perspectives to investigate CF2, namely: i) Contingency Theory ii) Resource Based View iii) Dynamic Capabilities View. Following a review on why these theories proved appropriate to the study, each theory is described. The direct influence on the conceptual framework, as a result of applying theoretical lenses, is captured in the results section, resulting in an update to the conceptual framework. Finally based on the theory grounded conceptual framework that emerges (CF3), a more specific set of Research Questions (RQs) and Research Propositions (RPs) are concluded in support of the next phase of the research.

In the context of the overall research journey, the development of a conceptual framework supported by existing theories, providing a set of RQs & RPs, was important to enable the next step of the research journey in conducting an in depth case study (Chapter 6). This would be the ultimate illustration of whether the framework had practical utility (Siggelkow, 2007), in line with the research objective.

5.1 Identifying Relevant Theoretical Lenses

In this section the rationale for the selection of specific theories is provided. An introduction to the relevant theories is presented to show why they were selected to provide perspectives on CF2, with a more detailed background to the theories following in subsequent sections.

In deciding what theory lenses might be appropriate to the study, there were two main inputs that the researcher considered:

1. Does the structure of the conceptual framework, CF2, point to existing theories that may be appropriate?
2. From the academic literature, what theories had been applied thus far when investigating the S&OP process?

The immediate indications arising from CF2 is that the framework implies that there are a defined set of conditions, to enable a set of processes, when enabling SA. The framework suggests that achieving SA is evidenced through the presence of strategic decision making. The structure of a set of "conditions" triggering a set of "enabling processes", to deliver the required "result", pointed the researcher in the direction of Contingency Theory (CT). The overall premise of CT is that in achieving organisational performance there has to be a *fit* between a set of response variables and a set of contingency variables (Donaldson, 2001). Further investigation revealed that CT had been used in a number of S&OP studies as shown in Table 5.1.

Table 5. 1: Examples of Contingency Theory in S&OP studies

Title	Author(s)	Publication	Year	Focus
Complexity as contingency in sales and operations planning	Thomé, Sousa & Scavarda	*Industrial Management & Data Systems*	2014	Survey of 725 manufacturing companies to understand contingent S&OP variables impacting on quality, delivery and flexibility
Context-based sales and operations planning (S&OP) research	Kristensen & Jonsson	*International Journal of Physical Distribution & Logistics Management*	2018	Systematic Literature Review – Using CT framework to determine the contextual variables that influence an effective S&OP design.
Developing and implementing contextualised S&OP designs – an enterprise architecture management approach	Kreuter, Kalla, Scavarda, Thomé & Hellingrath	*International Journal of Physical Distribution & Logistics Management*	2021	Case study in chemical plant using Enterprise Architecture Management (EAM) lens to assess the contextual challenges of people, process and tools, to influence S&OP designs to increase S&OP effectiveness

Thome et al. (2014) through the lens of CT revealed the S&OP process as an enabler to manufacturing operational performance, but they found it needs to *fit* with the tasks and

process complexities of the manufacturing site. For Kreuter et al. (2021a) the focus was on the effectiveness of the S&OP process and they used the CT construct to define the key contingencies that influence the S&OP design.

Of particular interest was the paper by Kristensen and Jonsson (2018) who conducted a Systematic Literature Review (SLR). Kristensen and Jonsson (2018) leveraged the CT lens for S&OP, to construct a research framework that brought forward the different types of contextual variables as per the contingency theory defined by Donaldson (2001) and looked for the fit of the S&OP design constructs as the response variables to deliver the performance variables of S&OP efficiency and effectiveness. The achievement of 'SA in S&OP' would be considered an efficiency performance variable in that it is not a business resulting performance measure but a measure of the process to deliver the business performance. The CT based research framework deployed by Kristensen and Jonsson (2018) provided an insight into how the CT lens could be of value when interpreting a body of literature related to S&OP. Their work indicated the value of CT when investigating S&OP:

> *"Contingency theory is a theoretical lens to view how and why implementations of these practices (S&OP) are successful, difficult or fail"* – (Kristensen and Jonsson, 2018, p.21)

Taking a similar approach to that positioned by Kristensen and Jonsson (2018, Figure 1, p.2), but applied to the narrower investigation of delivering 'SA in S&OP', a CT based lens provided guidance as to the key questions to be answered, as shown in Figure 5.1.

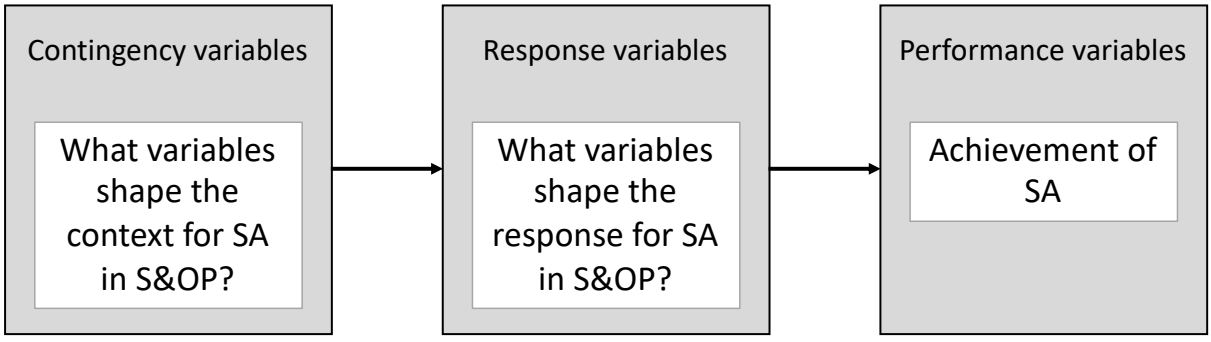


Figure 5. 1: Contingency Theory Lens

The framework in Figure 5.1 aligned well with the core structure of CF2. However, there were a couple of important areas not informed by the CT lens alone. Namely the feedback

loop in CF2 from the *Enabling Processes* to the *Conditions* as well as the intangible aspect of *Organisation Mindset* encapsulating the whole framework.

From reviewing the literature where CT was deployed, an area where CT was enhanced was in moving beyond the static perspective of *fit* between the contingency and response variables to also taking a view on the response variables as key resources with varying levels of capabilities (Sousa and Voss, 2008). Viewing the capabilities of the resources is the realm of Resource Based View (RBV) theory (Schroeder et al., 2002). RBV suggests that resources must be difficult to imitate and contribute positively to performance. With the additional RBV lens on resource capability the CF2 feedback loop comes into the frame. The feedback loop suggests that if the capability of the resources is not sufficient to deliver the performance, as indicated by the presence of strategic decision making, the conditions need revisiting to determine what action is required to obtain the required *fit*. Therefore, by including the RBV theory lens with CT a theoretical perspective can be brought to bear on CF2.

The final area addressed in CF2 is the intangible aspect of *organisation mindset*. The research leading to CF2 had indicated that building an organisation mindset for 'SA in S&OP' involved a number of activities including *leadership commitment, roles and responsibilities defined* and a *trusted S&OP team*. Turning to the literature a theory that complements the RBV theory is Dynamics Capability View (DCV) theory. DCV goes deeper into the resource capabilities as it relates to building a continuous alignment with the externally changing environment (Katkalo et al., 2010). As such it recognises how resources can be bundled together in building a higher order capability over time, to deliver a strategic advantage for the organisation. The *organisation mindset* positioned in CF2 represents an intangible capability of the organisation to continually align to the strategic direction of the company as defined in the strategic plan. Therefore, the DCV theory lens was deemed appropriate for investigating and interpreting what is meant by *organisation mindset* and how to go about achieving it.

In summary the theory lenses of CT, RBV/DCV were deployed to provide a deeper level of understanding to the evolving conceptual framework. The next three sections takes each of the theoretical lenses in sequence providing an overview of the theory. This is followed by a section showing how the theories had relevance, when investigating the conceptual framework (CF2), and the resulting impact.

5.2 Contingency Theory (CT)

5.2.1 Background to Contingency Theory (CT)

The foundations of Contingency Theory (CT) date back to the work of Woodward (1958), who linked organisation structures to manufacturing performance, finding that organisation structure in turn was contingent on a number of factors. These contingent factors were in categories of technology, environment and size. The environmental contingency was central to the work of Burns and Stalker (1961), who showed that an organic organisation structure with distributed decision rights, that could adapt quickly to uncertain environments, was more effective versus a mechanistic structure in delivering innovation. The foundational work of these authors supported further research into how organisation structures need to be responsive to key contingencies, with Lawrence and Lorsch (1967) advocating that no one organisation structure was appropriate for all scenarios, having to be aligned with the demands of the external environment. They acknowledged the tensions for organisations in positioning organisation units to manage the environment (*differentiation*) versus ensuring the units remained an integral part of the overall organisation (*integration*). Thompson (1967) leveraged the earlier work and suggested that when it came to maximising performance, organisation structures need to *"fit"* with contingencies such as technology, market conditions, regulatory requirements and organisation size. In line with studies primarily focused on manufacturing environments, Skinner (1969) showed how performance can be enhanced by ensuring that the manufacturing strategy is aligned to the corporate strategy, prescribing production systems and organisation priorities.

5.2.2 Concept of *Fit* in Contingency Theory (CT)

All of these early studies presented contingency theory such that performance is achieved by ensuring that organisation structures and/or processes achieve a *"fit"* with a set of contingency variables. This description of CT was enhanced by Child (1972) by introducing the concept of *"strategic choice"*. Child argued that when *"fit"* is not achieved then the "*dominant coalition"* (leadership team) may change some of the contingencies to regain the fit. This proposition was later challenged when Donaldson (1987) analysed data of the performance and organisation structures of 14 companies across 5 countries (France, Japan,

United Kingdom, United States and West Germany) over two decades (1950s and 1960s). Essentially by focusing on how organisations evolved (centralised versus divisional structures) in the midst of environmental drivers of strategic product portfolio changes (focused portfolio versus diversified portfolio), Donaldson analysed three forms of fit to see what delivered improved business performance. He found that the prevailing theories of structural change of *"contingency determination"* and *"strategic choice"* as inadequate, advocating a third formulation which he called *"structural adjustment to regain fit (SARFIT)"* (Donaldson, 1987, p.1). In support of the criticism of contingency determinism suggested by Child (1972), Donaldson found that there was a time lag involved (sometimes up to a number of years) before an organisational structure might be adjusted to regain fit. Significantly though he acknowledged from his studies that the prompt to make an organisation structure change invariably was triggered by a degrading business performance. Under the strategic choice contingency model, this fit could be achieved by the leaders of the organisation changing the contingencies (e.g.:- making a decision to narrow the product portfolio to match a centralised organisation design model). However, the empirical data in Donaldson's study found his hypothesis, as outlined here, to be false:

"Of the organizations which move from mismatch to match over a decade, as many adjust only their contingency as adjust only their structure" – (Donaldson, 1987, p.7).

In contrast, the findings provided support for the SARFIT formulation to fit, whereby over time organisations would adjust their organisational structure to regain fit to the product portfolio requirements (contingencies). Hence Donaldson found the following hypothesis to be true:

"A higher proportion of organizations which change only their structure in a period move from mismatch to match than vice versa" – (Donaldson, 1987, p.7).

Interestingly, the hypotheses were not universal and further reflections by Donaldson over the years would influence a softer stance on the strategic choice approach to regaining fit. In his book on the contingency theory of organisations, Donaldson (2001) acknowledged that contingency theory still holds true when structure triggers changes to contingencies. He referred to this formulation to fit as *"reciprocal causality"*. However, as the following quote demonstrates, he was clear that reciprocal causality works within CT so long as it is in addition to contingency causing structure and not instead of:

"Contingency theory would not be damaged, if, in addition to contingency causing structure, structure causes contingency. However, it is damaged, if, instead of contingency causing structure, as contingency theory supposes, structure causes contingency, that is, reverse causality" – Donaldson, 2001, p.138 (underlines added).

5.2.3 Contingency Theory (CT) in Operations Management (OM) Research

Reflecting on the CT studies over the years, the contingencies influencing organisation structure fall into three main categories: strategic, environmental or size (Woodward, 1958, Burns and Stalker, 1961, Lawrence and Lorsch, 1967, Donaldson, 1987, Donaldson, 2001, Ketokivi and Schroeder, 2004). As interest grew into the utility of CT in Operations Management (OM) research, the scope of contingencies, response and performance variables considered broadened. Sousa and Voss (2008) reflected on the research related to OM practice contingency research (OM PCR), from the perspective of contingency factors affecting OM best practice in manufacturing operations. From previous studies they highlighted a broad set of contingency variables as influencers of varying OM best practices to deliver a range of performance variables. Examples of contingency variables included *"country of location"*, *"firm size"*, *"rate of new product introduction"*, *scope of operations"*, "*quality context"*. OM practices spanned *"quality management"*, *"lean", "total preventative maintenance", "human resource practices*". In terms of performance variables, examples included *"customer results", "financial and market results", "employee satisfaction", "managerial performance"* - (Sousa and Voss, 2008, Table 1, pp.699-713).

Another important contribution from the OM PCR literature review, conducted by Sousa and Voss (2008), was an investigation of the various forms of *"fit"* employed in the previous studies. Leveraging the previous work of Drazin and Van de Ven (1985), three forms of fit employed were identified: Selection, Interaction and System. 'Selection' focuses on matching individual contingencies directly to individual response variables, without consideration of the effect on performance. 'Interaction' focuses on pairs of matched contextual and response variables that have an effect on performance. The 'System' approach acknowledges many contingency-response relationships and alternatives affecting the overall performance. This insight indicated a broad application where CT could bring value to OM PCR. Ultimately, they concluded that CT was a very useful theoretical lens to investigate OM issues and in particular where OM theory was less developed.

Demonstrating the broadening utility of CT, the first study to apply OM PCR to the business process of S&OP was conducted by Thome et al. (2014). Investigating complexity as a contingency, they concluded that S&OP does impact on manufacturing performance and the more complex the manufacturing process the higher the gains through S&OP. In doing so they positioned that the setup and structure of the S&OP process (response variables) had to fit with the task, product and process complexity (contingency variables) to deliver performance of quality, flexibility and delivery (performance variables). Another deployment of CT in S&OP was by Kristensen and Jonsson (2018). Investigating the influence of context in the design of S&OP to deliver performance, the CT lens was used to build a research framework to organise the studies from a systematic review of the literature. The framework supported investigating papers under a range of contextual variables (industry, complexity, firm size, manufacturing strategy, hierarchical planning framework, organisational characteristics), linking to S&OP design parameters and delivering performance of S&OP efficiency and effectiveness. This study again showed the value of CT as a lens when investigating the S&OP phenomenon. A more recent example by Kreuter et al. (2021a) also focused on leveraging CT to understand context specific S&OP designs. With support from an Enterprise Architecture Management (EAM) approach, they were able to identify context-specific challenges influencing S&OP designs increasing S&OP effectiveness.

5.2.4 Limitations of Contingency Theory (CT) in Operations Management (OM) Research

In terms of limitations, by reviewing the use of CT in OM research, Sousa and Voss (2008) highlighted studies where there were deviations from contingency-determined patterns. They labelled such situations as *"panacea"* (high use of determined patterns but low performance outcomes) and *"promising"* (low use of determined patterns but high performance outcomes). They concluded, when investigating phenomena in the realm of OM, where theories have yet to be developed, the CT lens could be complemented by three theories: "*institutional theory (Di Maggio and Powell, 1983), strategic choice theory (Child 1972) or the resource-based view of the firm (Barney, 1991)"* – (Sousa and Voss, 2008, p.708). Institutional theory posits that there are situations where organisations may adopt certain practice, not through strategic or environmental factors, but due to pressures of being seen to be doing the right things (e.g.:- the push for TQM or Lean manufacturing). The strategic choice theory, referenced earlier, posited that senior leadership could decide to change a

contingency factor to bring alignment to the organisation structure. The resource based view theory introduces a more dynamic perspective to CT by introducing the capability concept to the CT response variables. This is discussed in detail in the next section. Interestingly, all of these theories further support the application of CT in support of a process of achieving fit in response to contingency variable changes, but also notwithstanding the need to achieve fit, it could be triggered by other considerations (e.g.:- capability of the response variables) if the expected performance is not achieved.

In summary, Contingency Theory (CT) has evolved from its foundations in the 1950s/1960s to where today it clearly has application in Operations Management (OM) research and has demonstrated its value in providing a theoretical lens when investigating the S&OP phenomenon. Its utility can be enhanced when complemented by other theories. In particular with the identified response variables defined as enabling processes in CF2, the capability of these processes is a consideration when it comes to fit with the contingency variables. This brings to the fore the Resource Based View (RBV) theory as a complimentary theory to CT, as identified by Sousa and Voss (2008), when considering the capability paradigm. This is discussed in the next section.

5.3 Resource Based View (RBV) Theory

5.3.1 Background to Resource Based View (RBV) theory

Reviewing the firm from a resource perspective has its origins in the research of Edith Penrose in 1959 (Penrose, 1995). Penrose's seminal book addressed and challenged a number of theories including the general *theory of the firm*, *economical theory of the firm, behavioural theory of the firm* and at the most fundamental level the use of the word *firm,* which Penrose argued was *"by no means an unambiguous clear-cut entity"* (p.9), positing that the *firm* was in essence an *"Administrative Organization"* (p.13). If there is to be an accurate definition of the firm for Penrose it is *"a collection of productive resources"* (p.24). Penrose was concerned about the growth of a firm which she argued was limited by *"the capacities of the existing managerial personnel"* (p.41). Her argument focused on the norms and experiences that the management team built up over time. In order for new management to be integrated into this team would require conscious effort of time and resources and in busy environments such capacity would be limited. Reflecting on firm growth through this

lens, Penrose argued that should a firm attempt to grow faster than new management can be assimilated into the existing team, the efficiency of the firm will suffer and run the risk of not being able to efficiently compete in the market. Therefore, the opposite effect of the intended growth may be the result. According to Penrose, the "*services"* provided by the existing managerial resources *"limit the amount of expansion that can be planned at any given time"* (p.44). With growth plans, even when managerial resources are available and have capacity to integrate in new resources, Penrose also addresses the risks and uncertainties that exist in strategic expansion plans. Estimating the risks and putting plans in place to avoid the uncertainties are key activities for the management team. The conclusions provide extra limiting factors on growth, even if the managerial resource capacity is available.

Maybe as a result of the broad scope of Penrose's book, resulting in interest and citations across a range of disciplines, it was a number of years later when Rubin (1973) returned to the resource based view of the firm, emphasising the resource utility aspect of Penrose's definition, expressing that a resource should help a firm to perform a particular task. He defined a resource as being made up of *"people and the real assets that they use"*. This holistic definition of a resource was encapsulated in an example where Rubin (1973, p.937) described a resource called *"metal stamping"* as being made up of *"managers of the metal stamping division, the equipment, and the skilled labor"*.

Building on the foundational work of Penrose in 1959 and Rubin in 1973, the theory took on the Resource Based View (RBV) label when Wernerfelt (1984) published the paper titled *"A Resource-based View of the Firm"*. He defined a resource as a *"strength or weakness of a given firm"* and as examples cited *"brand names, in-house knowledge of technology, employment of skilled personnel, trade contacts, machinery, efficient procedures, capital, etc."* (p.172). Looking at growth in terms of high value returns (profits) over time, Wernerfelt leveraged Michael Porter's five competitive forces (Porter, 1997) to investigate the role of resources in supporting the growth of the firm. He argued how various resources have a fundamental role to play giving examples such as patent holders controlling the use of the resource (*bargaining power of supplier*) , building customer specific machinery restricts the growth opportunity beyond the customer usage (*bargaining power of buyers*) and when alternate technology can be developed, it reduces the value of what may have been considered a competitive technology (*threat of substitute resources*). When someone has a unique resource, then it will impact on the costs and/or revenues of later acquirers (*resource position barriers)*. Wernefelt also focused on the acquisition and trading of resources through

mergers and acquisitions (*rivalry among competitors*). Through the construction of a resource-product matrix, he demonstrated that resources have a complimentary role to play, along with product, when it comes to supporting a firm execute on it's growth strategies.

5.3.2 Resources in support of a competitive advantage for the firm

Barney (1991) delved further into the role of resources, in supporting the growth of the firm, by concentrating on how resources could provide a sustained competitive advantage. Positioning resources into categories of physical capital resources, human capital resources and organizational capital resources, Barney aligned with previous authors (e.g.:- Penrose, 1959, Wernerfelt, 1984) in clarifying that within these categories, firm resources meant that they had to be an enabling factor to improve a firms efficiency and effectiveness. For such resources to provide a sustained competitive advantage for the firm, they must have four key attributes: *"(a) it must be valuable, in the sense that it exploits opportunities and/or neutralizes threats in a firm's environment, (b) it must be rare among a firm's current and potential competition, (c) it must be imperfectly imitable, and (d) there cannot be strategically equivalent substitutes for this resource that are valuable but neither rare or imperfectly imitable"* (Barney, 1991, pp.105-106). Interestingly, one of the ways that resources are imperfectly imitable is when causal ambiguity exists between the resources within the firm and the firms' sustained competitive advantage. Collectively these factors became known by the term VRIN (Valuable, Rare, Imperfectly imitable, Non-substitutable). Investigating the strategic planning process as a source of sustained competitive advantage, Barney (1991) argued that formal strategic planning could be learned by organisations and would not likely qualify. However, considering more informal strategic planning, e.g., emergent strategic planning, advocated by Mintzberg and Waters (1985), then it is feasible according to Barney that the VRIN attributes could be recognised. To achieve a competitive advantage, in a changing environment, Prahalad and Hamel (1990) argued that it was rooted in competencies: *"The real sources of advantage are to be found in management's ability to consolidate corporatewide technologies and production skills into competencies that empower individual businesses to adapt quickly to changing opportunities"* (p.81). In order to be able to adapt resources to a changing environment requires a process like S&OP to be continually monitoring the latest landscape. However, it can only work if strategic alignment of the organisation is achieved.

5.3.3 Intangible Resources

In striving to achieve a sustained competitive advantage it was acknowledged that intangible resources typically played a bigger role that tangible resources (Wójcik, 2015), being more difficult for competitors to imitate. In building a framework linking intangible resources and capabilities to sustainable competitive advantage, Hall (1993) set about defining a number of key terms including: *intangible resources, assets, competencies and capabilities*. Acknowledging that these terms were interrelated, he argued that: *"Intangible resources may be classified as assets or competencies"* – (Hall, 1993, p.608). Examples of assets included intellectual property and trade secrets whereas examples of competencies related to the know-how of employees and the culture of the organisation. Capabilities in turn could be based on assets or competencies. Hall (1993) describes *regulatory capability* (e.g.:- legal entities such as intellectual property rights than can be defended in law) and *positional capability* (e.g.:- reputation with customers), as capabilities based on assets. Distinguishing two capabilities based on competencies, he described *functional capability* (e.g.:- capability to do specific tasks based on knowledge, skill and experience of employees) and *cultural capability* (e.g.:- the attitudes, beliefs and values of the organisation as a whole). Addressing resources in general, Hooley et al. (1998) suggested while resources contain both assets and capabilities, the terms capabilities and competencies can be used interchangeably. Barney (1991) described firm resources to include *"all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive and implement strategies that improve its efficiency and effectiveness"* – (Barney, 1991, p.101). Fundamentally, the core concept presented by Penrose in 1959 remains at the heart of how capabilities are understood in RBV theory – essentially as *"a collection of productive resources"* (Penrose, 1995, p.24).

5.3.4 Limitations of Resource Based View (RBV) theory in dynamic market environment

Reflecting on the growing influence of RBV thinking as positioning capabilities to deliver a sustained competitive advantage, Hooley et al. (1998) highlighted the internal orientation of the theory as opposed to external market orientation theory which was also popular. He argued that while seemingly contradictory they were in fact complimentary when viewed through the lens of competitive positioning. In terms of leveraging existing resources in the pursuit of competitive advantage, RBV theory aligns to the *Ricardian* approach (Wójcik,

2015). When it comes to building capabilities through innovation and entrepreneurship, RBV concepts align with the *Schumpeterian* approach (Wójcik, 2015). When considering how resources are used and allocated, to deliver competitive advantage, in an external environment of constant change, RBV theory was enhanced in the 1990s when Teece and Pisano (1994) introduced *Dynamic Capabilities View*. This was positioned as an enhancement to RBV focusing more on the *Schumpeterian* approach to building capabilities that can respond in a dynamic fashion to a changing environment, resulting in changes to the organisation system. Essentially DCV provided a more "outside in" perspective (dynamic) to complement a more "inside out" perspective (static) of RBV. This is further explored in the next section.

5.4 Dynamic Capabilities View (DCV) Theory

5.4.1 Background to Dynamic Capabilities View (DCV) theory

Building on what was considered a static view of resources defined by RBV, Dynamic Capabilities View (DCV) theory emerged in recognition that to build a competitive advantage it was not sufficient to build capabilities to deliver on a fixed strategy. DCV took the "outside in" perspective investigating the firm resource capability to proactively seek out changes in the external environment, have processes to internalise the impact of potential changes to the internal resource capabilities, and reconfigure to optimise the capabilities to meet the ever changing market challenges (Teece and Pisano, 1994). In breaking down the terminology Teece et al. (1997) identify *"dynamic"* as referring to *"the capacity to renew competencies so as to achieve congruence with the changing business environment"* – (p.515). In respect of the linked *"capabilities"* term, they state, it *"emphasizes the key role of strategic management in appropriately adapting, integrating, and reconfiguring internal and external organizational skills, resources, and functional competences to match requirements of a changing environment"* – (p.515). The enhancement that DCV brings to RBV is evident in building existing and new capabilities to deliver competitive advantage in a changing environment, requiring a dynamic strategic plan (DCV), versus building capabilities from existing resources to differentiate and succeed in markets in support of a static strategic plan (RBV).

5.4.2 Defining Dynamic Capability

It is acknowledged that organizational capability is essentially a collection of routines (patterned activity), repeated systematically to build the desired capability (Teece et al., 1997, Winter, 2003). In building towards a dynamic capability, Wang and Ahmed (2007) define such capability as *"a firm's behavioural orientation constantly to integrate, reconfigure, renew and recreate its resources and capabilities and, most importantly, upgrade and reconstruct its core capabilities in response to the changing environment to attain and sustain competitive advantage"* – (p.35). This definition captures the essence of dynamic capabilities and encapsulates the significant contributions of the seminal authors to that point.

5.4.3 Building Dynamic Capabilities over time

Acknowledging DCV as an extension of RBV, many authors investigated the pathway for organisations to progress from having valuable resources to exhibiting dynamic capabilities (Teece et al., 1997, Winter, 2003, Wang and Ahmed, 2007). The Dynamic Capabilities View (DCV) theory distinguishes between basic (or ordinary) capabilities and higher order capabilities (Winter, 2003) with the former associated with the basic day-to-day capability to operate and the latter a more dynamic capability to respond to change. Dynamic capabilities typically present as a hierarchy from first-level upwards. Teece (2018) makes a useful distinction considering lower-level dynamic capabilities involving "adjustment and recombination of a firm's existing ordinary capabilities, as well as development of new ones" (pp.40-41) with second-order capabilities at a more strategic level, for example new products/markets. Wang and Ahmed (2007) propose a hierarchical structure to building capabilities with resources (zero-order), capabilities (first-order), core capabilities (second-order), dynamic capabilities (third-order). Key to understanding the pathway to building dynamic capabilities is the appreciation that the essence of resources with competencies is that they cannot be bought – they have to be built over time (Katkalo et al., 2010).

Inherent in the building of dynamic capabilities is that it takes time to create, extend or modify its resource base. The speed at which a firm can realign its resources to deliver the strategic expectations, in a changing environmental context, is dependent on the strength of the firm's dynamic capabilities (Teece, 2018). Teece positions *strong* dynamic capabilities as generally meaning *"strong (relative to competitors) in all relevant areas of sensing, seizing, and transforming"* – (p.43). Therefore, strong enough to deliver a competitive advantage. That is not to say that the opportunity to reinvent resources in response to expected

environmental changes is limitless. The premise posited by Penrose (1995), on the limitations to growth based on the capacities of the existing managerial personnel, expresses the practical limitations to what can be achieved over a given time period. As highlighted by Wang and Ahmed (2007): "*The intervention of strategy on capability development also implies that firms face organizational trade-offs in choosing between alternative capability development"* (p.41). The role of managers in dynamic capabilities is acknowledged by Helfat et al. (2007), as the orchestrators of achieving new combinations of resources.

In their book on examining dynamic capabilities in the context of understanding strategic change in organisations, Constance Helfat, along with leading scholars in the field of dynamic capabilities, highlight learning as a key ingredient:

"Key ingredients of dynamic capabilities include organizational processes directed toward learning and innovation, the basic manner in which a business is designed, as well as the decision frames and heuristics that inform firms investment choices over time" – (Helfat, et al., 2007, p.19).

The learning and innovation is built through building and changing organizational and managerial processes:

"There is an inextricable link between dynamic capabilities and the organizational and managerial processes that underpin them", and *"Processes are mechanisms by which dynamic capabilities are put to use, and mechanisms by which organisations can develop dynamic capabilities"* - (Helfat, et al., 2007, p.30).

Therefore, over time the learning experiences through building the capabilities of organisational and managerial processes are central to building the dynamic capabilities of the organisation.

5.4.4 Growth perspective as a dynamic capability

When considering the organisation capabilities to deliver on the strategic plan of a business the implication of having a growth focus emerges. As was described in Chapter 1, while it is reasonable to expect all strategic plans to focus on growth, the scope of growth could be different to the traditional economic assumptions around revenue, profit, gross margin. It could equally be that a company is focused on growing their ESG (Environmental, Social and Governance) programmes and these goals form the core of the strategic plan. However, one could argue that in this example ESG is a means to an end (financial), as companies

recognise the importance of sustainability to customers and suppliers alike. Helfat et al. (2007) argue that most companies are striving for *"growth persistence"* and that firm growth is non-random and consistent with dynamic capabilities. Linking back to discussion on RBV theory, this perspective on growth is aligned with the *Schumpeterian* approach to deploying resources.

Positioning the hierarchy of capabilities in the context of S&OP was the subject of a contribution by Nicolas et al. (2020), which included Antônio Márcio Tavares Thomé, as one of the authors. As has been noted in this thesis, Thomé is one of the most cited authors on the subject of S&OP over the years. Positioning S&OP as a process that can deliver a competitive advantage, they leverage the theories of RBV/DCV to propose the meta-characteristics for a taxonomy of S&OP. In doing so Nicolas et al. (2020) define strategic capabilities as the *"ability to integrate resources and lower-order capabilities with reference to the adopted strategy"* while dynamic capabilities are defined as the *"ability to cyclically renew its lower-order capabilities and resources according to the environmental change"*- (Nicolas et al., 2020, Fig 1), illustrating that such capabilities include cognitive as well as technical capabilities. Referencing the earlier work of Wang and Ahmed (2007), they aligned with the capability levels from level zero as *resources*, first level *capabilities* called *functional capabilities* in S&OP, second level *core capabilities* as *strategic capabilities* in S&OP and third level as *dynamic capabilities*. This contribution provided an initial framework to further investigate the S&OP phenomenon through the lenses of RBV/DCV.

In summary the Dynamic Capabilities View (DCV) theory evolved from and extended the concepts of Resource Based View (RBV) theory to incorporate the capabilities required to be able to sense the external environment changes, seize on opportunities for growth and transform resources to capitalise on opportunities to create a sustained competitive advantage. The strong link to RBV from DCV was reflected by Helfat and Peteraf who coined the term *"dynamic resource-based view"* (Helfat et al., 2007, p.120).

5.5 Deploying Theoretical Lenses

5.5.1 Investigating CF2 through theoretical lenses

Investigating the conceptual framework (CF2) through the theoretical lenses of CT and RBV/DCV provided a perspective of how to present the framework in a way that was

grounded in theory. This was important also in terms of positioning the framework for the next stage of the research journey in terms of conducting an in depth case study (Chapter 6).

A depiction to reflect where the theoretical lenses provided the greatest insights is shown in Figure 5.2. The green arrows point to the most relevant constructs of CF2 where the various theories added valuable perspective.

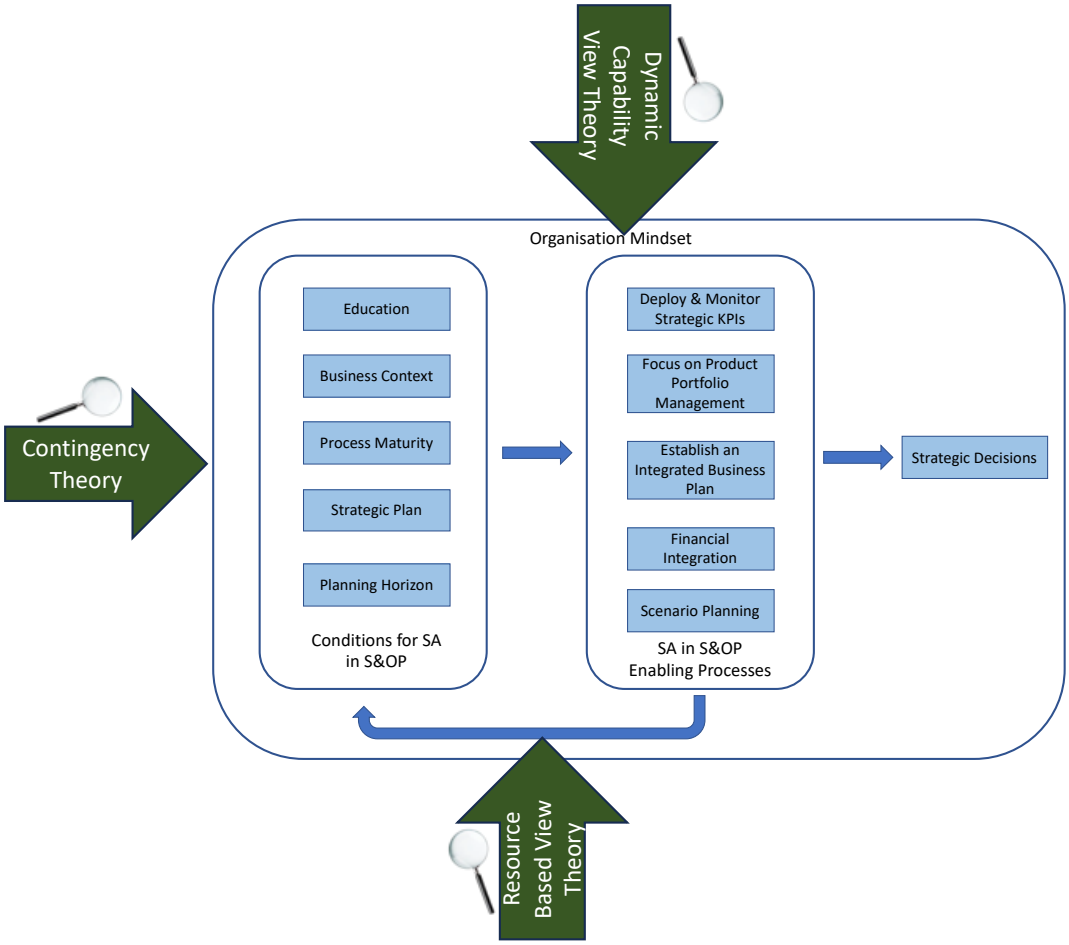


Figure 5. 2: Analysing CF2 through theoretical lenses

The CT lens was particularly useful in reviewing the overall construction of the framework and the utility of the individual constructs. The RBV lens enabled an investigation into the feedback loop in the CF2 framework and what it could mean in the context of delivering 'SA in S&OP'. The intangible element of 'Organisation Mindset' when viewed through the lens of DCV provided insights into the capability that would be reflected by a mindset to achieve 'SA in S&OP'.

The primary influences that each of the theoretical lenses contributed in terms of updates to CF2 are described in turn, leveraging the descriptions of the theories from the previous sections.

5.5.2 Contingency Theory (CT) Lens

On completion of the Delphi study the CF2 framework was structured such that a set of conditions had to be met in order to enable a set of processes to ultimately deliver 'SA in S&OP', demonstrated through strategic decision making.

Through the CT lens, the set of conditions were identified as *contingencies*. Using the broad contingency categories of strategic, environmental, size (Donaldson, 2001) the conditions in CF2, in the context of a framework enabling 'SA in S&OP', were mapped as shown in Figure 5.3. Reflecting on the conditions as contingencies also prompted some adjustments to the naming of the resultant contingencies (highlighted in green), to better reflect their intent.

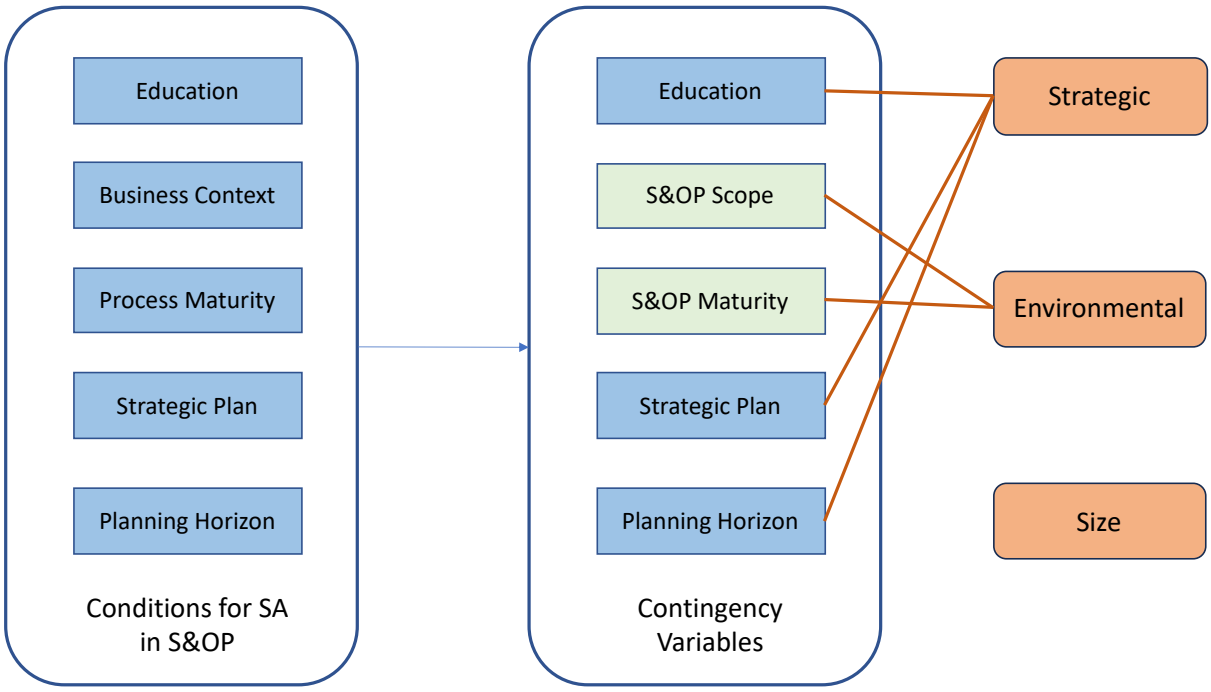


Figure 5. 3: Mapping Conditions of CF2 as Contingency Variables

Considering the typical categories of contingent variables (Donaldson, 2001), it is unsurprising that the prominent category when investigating the phenomenon of 'SA in S&OP' is the *strategic* category.

Treating the conditions as contingency variables provided a better perspective on the intent, i.e. to ensure that these aspects were addressed sufficiently as a contingency to the enabling processes. The importance of setting the strategic direction and making it clear in the S&OP process was a key contribution from the Delphi study. Therefore, it is unsurprising that the *strategic* category is most prominent. The strategic contingencies were reflected in the conditions of the 'Strategic Plan', 'Education' on strategic alignment ambition and aligning on the expected 'Planning Horizon'. The environment contingencies were reflected in the 'Process Maturity' of the S&OP process and also the 'Business Context' in support of 'SA in S&OP'. The *size* contingent category was not mapped to the CF2 contingencies, reflecting that the evidence did not indicate the size of the organisation, as a contingent factor in the achievement of 'SA in S&OP'. As shown in Figure 5.3, when considering the overall context of enabling 'SA in S&OP', a more accurate naming as contingency variables was assigned to 'S&OP Scope' (replacing 'Business Context') and 'S&OP Maturity' (replacing 'Process Maturity'). The renaming of these constructs focused attention more narrowly to the phenomenon under investigation.

Investigating the enabling processes in the CF2 framework, through the lens of CT provided a perspective to consider the processes as 'response variables'. As mentioned previously, the processes of S&OP had been positioned as response variables in a CT based framework in the study conducted by Thome et al. (2014). Viewing the processes as response variables challenged the use of the verbs in the naming. The verbs provided a level of prescription to the enabling processes that was too restrictive when treating them as variables. Therefore the labelling of the constructs was adjusted to remove the use of verbs, hence removing this restriction, as shown in Figure 5.4.

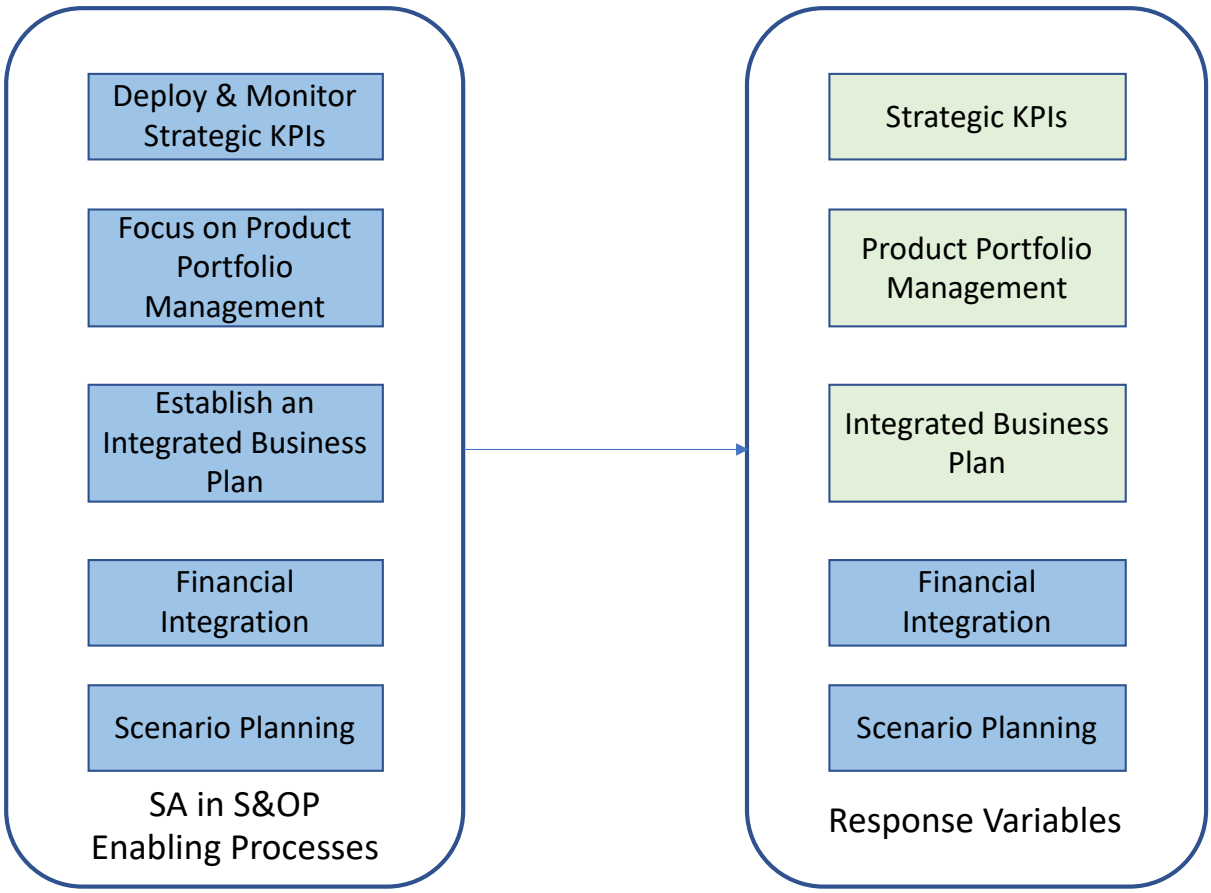


Figure 5. 4: Mapping enabling Processes of CF2 as Response Variables

The constructs that were renamed are highlighted in green.

As discussed earlier the premise of CT is that by aligning the organisation structure to the business contingencies then superior performance is achieved. Applying the CT lens to the 'SA in S&OP' phenomenon, the Delphi study suggested that this can be measured by monitoring strategic decisions made. Under the lens of CT this was identified as the 'Performance Variable'. Recognising 'strategic decisions' being made as a measure of achieving 'SA in S&OP' does not address the efficacy of the decisions themselves in delivering business performance. Therefore, in line with the categorisation used by Kristensen and Jonsson (2018) the performance variable was poisoned as an 'Efficiency Performance Variable' (as opposed to an effectiveness performance variable).

At the heart of CT is the subject of *fit* between the contingency and response variables. Investigating the three forms of fit (Sousa and Voss, 2008) it was clear that the *system* fit was applicable to CF2, with many contingency-response relationships evident. For example, one can envision a change to the 'S&OP scope' contingency variable to include the tracking of

strategic projects, would trigger a response to update the 'Strategic KPIs" and 'Integrated Plan' response variables. Equally a decision to increase the contingency variable 'Planning Horizon' would necessitate a response from the 'Product Portfolio Management', 'Integrated Plan' and 'Financial Integration' response variables. The subject of *fit* will be revisited in the next section when considering the influence of the RBV lens.

5.5.3 Resource Based View / Dynamic Capabilities View (RBV/DCV) Lenses

With DCV being an extension of RBV, the impact of applying these theoretical lens to the CF2 framework are discussed together in this section.

Collectively the concept in CF2, of having a set of *enabling* processes, resonates with RBV theory of having a collection of productive resources (Penrose, 1995). The processes when viewed as a collection of resources have a defined purpose to enable 'SA in S&OP'. As discussed earlier, treating business processes as resources is in line with RBV theory (Helfat et al., 2007, Katkalo et al., 2010). As resources, each of the enabling processes (response variables) have a capability reflective of the process design and the competencies of the organisation operating the processes. In particular if the capability of these resources were developed to meet the VRIN criteria (Barney, 1991) then they could support the S&OP process overall to provide a sustained competitive advantage for the organisation. However, if the capability was such that 'SA in S&OP' was not being achieved then as outlined in CF2, the feedback loop would be triggered to determine where the fit between the contingency and response variables had broken down. This was a key contribution of the RBV lens as it provided the capability paradigm when monitoring the response variables, which it turn gave a basis for the feedback loop construct of CF2.

Revisiting the concept of *fit,* the feedback loop, when triggered by below expected capability of the response variables, was reflective of the *"reciprocal causality'* (Donaldson, 2001) and *"strategic choice"* (Child, 1972) aspects of Donaldson's SARFIT (Strategic Alignment to Regain FIT) under CT. Therefore, as advocated by Sousa and Voss (2008), the benefit of complementing CT with RBV theory for Operations Management (OM) research was evident.

The proposition of CF2 was that through iterations of the feedback loop over time, the capabilities of the enabling processes (response variables) increased and the organisation involved in S&OP developed a mindset oriented toward 'SA in S&OP'. Investigating this

aspect through the lens of DCV and the hierarchy of capabilities provided insights into the intangible capability associated with the organisation mindset. The findings from the ILR suggested that organisations need to progress from a *"control"* mindset focusing on supply chain alignment to include a *"growth"* mindset focusing on delivering the business strategy. For organisations who have a capability to continually span the external environment and stay aligned to an intentional and emerging strategy, while adjusting resources accordingly, is regarded as having achieved *dynamic capabilities* (Teece, 2018). Therefore, viewing through the lens of DCV, the organisation mindset to deliver 'SA in S&OP' was reflective of an organisation with dynamic capabilities. To achieve this takes time and requires a learning environment (Helfat et al., 2007). The feedback loop construct of CF2 provided the mechanism for the learning environment to build the capability over time.

With the S&OP participants operating with a mindset oriented towards achieving 'SA in S&OP', delivered as part of the learning environment created through aligning key contingent factors to enabling processes capable of enabling 'SA in S&OP', the focus on the business strategic plan remains paramount and SA becomes a necessary requirement. Therefore the organisation mindset is oriented towards whatever *growth* strategies that are defined in the strategic plan. In conclusion, through investigating CF2 through the lens of DCV the intangible 'organisation mindset' was updated to be more instructive, calling it 'growth mindset', as illustrated in Figure 5.5.



Figure 5. 5: DCV lens prompting updating 'Organisation Mindset' to 'Growth Mindset'

5.5.4 Revised Conceptual Framework CF3

Through investigating CF2 through the theoretical lenses of CT and RBV/DCV, a further evolution of the framework was constructed (CF3) as shown in Figure 5.6. The style of how the framework was depicted was updated to reflect the overall CT based framework, based on a similar style to that deployed by Kristensen and Jonsson (2018).

In terms of the overall structure of CF3, one further change was made as part of the final stages of analysis using the theoretical lenses.

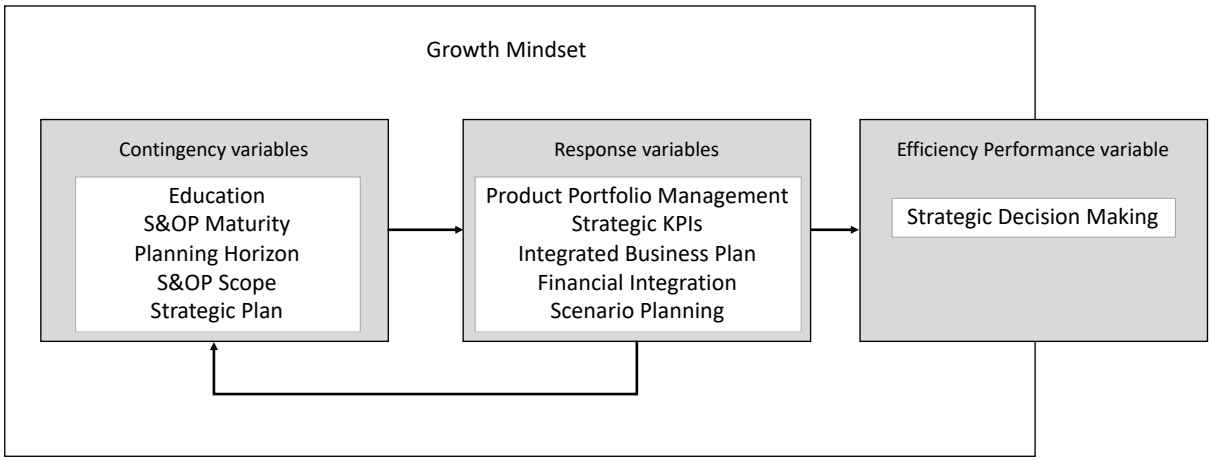


Figure 5. 6: Conceptual Framework CF3

Reflecting on 'Strategic Decision Making' as an efficiency performance variable, it was evident that with the focus on 'SA in S&OP', the achievement of such is a step before the enablement of strategic decision making. While it is evident that no strategic decisions could be made in S&OP without 'SA in S&OP' being achieved, it is possible that that there are other moderating or even mediating factors that could influence whether strategic decision making occurs or not. Therefore, the achievement of 'SA in S&OP' is manifest in the 'growth mindset' of the organisation which is only of value if strategic decisions are made as a result. Therefore, the boundary of the 'SA in S&OP' conceptual framework while incorporating the performance variable of 'strategic decision making', did not fully encapsulate it. This kept the door open to investigate further in the next stage of the research (i.e. the case study) as to how organisations measure when 'SA in S&OP' is achieved.

This capability to align with strategy and dynamically adjust as the environment changes reflects the vertical aspect of S&OP (i.e. Strategic Alignment). The feed-forward relationship between contingency variables and response variables and the feedback loop in the conceptual framework (Figure 5.6) taken together, represent the SA capability. The former entails the need to respond to contingency variables as suggested by contingency theory. In relation to the latter RBV/DCV suggests that organisations sometimes need to realign the contingency variables as part of their process of dynamic adjustment.

While CT provides a structured approach to investigate the key contingency and response variables to achieve the SA performance variable, Resource Based View (RBV) theory offers

the capabilities paradigm as a key consideration when it comes to the fit between contingency and response variables (Schroeder et al., 2002). The organisational capabilities described in RBV are high-level routines (or collection of routines) and highly patterned, they may be founded in part in tacit knowledge (Winter, 2003). Hence the response variable processes include the competencies of the individuals and teams operating the processes.

For this study RBV/DCV theory provides a useful lens to interrogate organisation capability that arises from the application of CT, in particular the relationship between response variables and contingent variables. The intangible concept of building an organisation mindset that can enable 'SA in S&OP' can be better understood by assessing the capability through the lens of DCV theory, captured as 'growth mindset'.

The deployment of the theoretical lenses supported the evolution to a theoretically grounded framework. In particular it changed the structure of the framework and provided a theoretical basis for analysing the core elements of the framework. While enhancing the structure the theoretical lenses also triggered a reflection on the naming of some of the constructs, to more accurately reflect the intent of the conceptual framework. There were no changes related to the Delphi contribution of the positioning of the framework in the planning hierarchy.

5.6 Research Questions & Research Propositions

The conceptual framework (CF3) evolving from the application of the theoretical lenses of CT and RBV/DCV, brought further clarity to the overall research objective to gain an understanding of the factors and approaches to enable organisations achieve Strategic Alignment (SA) in S&OP

Having addressed the specific Research Propositions (RPs) and Research Questions (RQs) in the Delphi study, applying the theoretical lenses, the latest evolution of the conceptual framework (CF3) provided two specific Research Questions (RQs) and five Research Propositions (RPs) to guide the next phase of the research. In line with the theory/practice investigations, the next stage sought empirical evidence, through an intrinsic case study, to support/refute CF3. Reflecting on CF3 as shown in Figure 5.6, the following RQs and associated RPs were defined:

RQ1: To what extent does the evidence, from an investigation of an exemplar case study, support the constructs and relationships as defined by CF3.

RQ1 is supported by a number of propositions to be investigated through the case study, as follows:

⇒ RP1: The implementation of the defined set of contingency variables have a direct influence on the enabling role of the set of response variables in achieving 'SA in S&OP'.

⇒ RP2: The capability of the response variable processes, to achieve 'SA in S&OP', is achieved through maintaining a closed loop feedback to the contingency variables, in order to ensure a fit is maintained between the contingency and response variables.

⇒ RP3: The capability of the response variable processes, in achieving 'SA in S&OP' is demonstrated by a growth mindset in the organisation directly involved in the S&OP process.

⇒ RP4: The presence of strategic decision making is an indicator that SA is achieved in S&OP.

The second RQ relates to the positioning of S&OP in the planning hierarchy:

RQ2: How does the positioning of S&OP in the planning hierarchy affect the enablement of 'SA in S&OP', as evidenced when investigating an exemplar case study?

The associated proposition investigated in the case study was:

⇒ RP5: The positioning of the S&OP process in the planning hierarchy with two-way linkages to the strategic and operational planning levels is an enabler to achieving 'SA in S&OP'.

While the RQs/RPs guided the research protocol for the case study, with an exemplar case for 'SA in S&OP' being observed, it was also important to remain open and vigilant for any emerging insights that could influence the structure or constructs of the evolving conceptual framework (Miles and Huberman, 1994).

5.7 Summary

The findings from analysing the conceptual framework (CF2), through the selected theoretical lenses of Contingency Theory (CT), Resource Based View (RBV) and Dynamic Capabilities View (DCV), supported a re-structuring of the framework, revised to CF3. The

enhancement ensured that CF3, while providing practical guidance on how to go about achieving 'SA in S&OP', was also grounded in proven theoretical premises.

The next stage of the research was to access a live field study where 'SA in S&OP' was practiced. This afforded the opportunity to observe causal relationships first hand, one of the significant advantages of case studies versus large sample empirical work (Siggelkow, 2007). The objective was to seek evidence to support/refute the RPs, while remaining open to evidence that could drive a further evolution of the CF3 framework. Chapter 6 describes the single case study to deliver on this objective.

CHAPTER 6: THE CASE STUDY

6.0 Introduction

This chapter furthers the iterative approach between theory and practice. It seeks empirical evidence through a research case study in support of the Research Propositions (RPs) put forward at the end of the previous chapter. Hence the Conceptual Framework (CF3) guided the case study design.

The Case Study (CS) was particularly important as part of the overall research study in recognising that 'SA in S&OP' is an emerging topic with no academic studies which specifically investigated the phenomenon to date. Therefore, in support of the Integrative Literature Review, the Delphi expert field study and insights provided though application of theoretical lenses, the CS afforded the opportunity to go back into the field to investigate the phenomenon of 'SA in S&OP' in depth, in a real-life context.

With the Research Questions (RQs) and Research Propositions (RPs) being central to the case study, they are repeated here again for reference:

RQ1: To what extent does the evidence, from an investigation of an exemplar case study, support the constructs and relationships as defined by CF3.

A number of research propositions support RQ1, as follows:

⇒ RP1: The implementation of the defined set of contingency variables have a direct influence on the enabling role of the set of response variables in achieving 'SA in S&OP'.

⇒ RP2: The capability of the response variable processes, to achieve 'SA in S&OP', is achieved through maintaining a closed loop feedback to the contingency variables, in order to ensure a fit is maintained between the contingency and response variables.

⇒ RP3: The capability of the response variable processes, in achieving 'SA in S&OP' is demonstrated by a growth mindset in the organisation directly involved in the S&OP process.

⇒ RP4: The presence of strategic decision making is an indicator that SA is achieved in S&OP.

The second RQ relates to the positioning of S&OP in the planning hierarchy:

RQ2: How does the positioning of S&OP in the planning hierarchy affect the enablement of 'SA in S&OP', as evidenced when investigating an exemplar case study?

The associated research proposition in support of RQ2 is as follows:

⇒ RP5: The positioning of the S&OP process in the planning hierarchy with two-way linkages to the strategic and operational planning levels is an enabler to achieving 'SA in S&OP'.

This chapter begins with a description of the single case study business (6.1). Following this the key findings are presented in section 6.2, from observing the IBP process over the three cycles and conducting targeted interviews with key informants in the case study business. Leveraging Thematic Analysis (TA) methods these findings are further analysed and interpreted, extracting key themes as described in section 6.3. The next section (6.4) discusses the implications of findings, insights and interpretations relative on the evolved conceptual framework (CF4). Conclusions are drawn relative to the guiding research propositions in section 6.5 followed by a brief summary of the chapter in section 6.6. The broader implications to theory and practice are discussed in the next chapter (Chapter 7).

6.1 The Case Study Business

As outlined earlier in Chapter 3, a single case study business was selected to obtain in-depth knowledge on the phenomenon (Dyer and Wilkins, 1991). With the starting point being the Conceptual Framework (CF3) and a set of Research Propositions (RPs), the objective was to find a case study business where *"explanatory"* insights could be obtained (Bass et al., 2018). Therefore, an exemplar company was sought (*intensity sample)* as described by Patton (2002a). As described in Chapter 3 (section 3.2.6) 'BigPharma' met the criteria required and agreed to be the subject of the case study.

The background information to 'BigPharma' was obtained through a number of sources:

- Kick-off interviews with the two IBP Process Leaders.
- Confidential documentation provided:
    - Site Overview presentation pack
    - Site Strategic Plan
    - Document called "Compelling Business Needs"
    - Integrated Business Plan (IBP) operating procedure

The case study business ('BigPharma') is a large pharmaceutical manufacturing operation. It is located in Ireland and is a significant component of a very large global pharmaceutical company. As of 2022, 26% of the global revenue for the corporation was from products manufactured at the manufacturing site, servicing over 110 global markets. It has a little under 1,000 employees on site. It has been in operation for over twenty years. Over time 'BigPharma' has grown its capability such that today it can manufacture, test, pack and distribute a range of technologies including, lyophilized or liquid products, tablet sachet and capsule, pre-filled syringe and devices. This is what 'BigPharma' call *"E2E Patient Supply"* (End to End Patient Supply). In terms of cementing their value within the corporation the site capability includes manufacturing support for clinical batches and New Product Introductions (NPI), as well as commercial products. The Quality Control (QC) testing capability includes analytical, functional, micro-biological and stability, enabling 'BigPharma' to service other sites within the company for testing in addition to their own manufactured products.

Within the corporation 'BigPharma' are one of a number of manufacturing entities. They are described as a global, low volume, high complexity, high value operation. A diagrammatic representation of the site within the corporate context is shown in Figure 6.1.

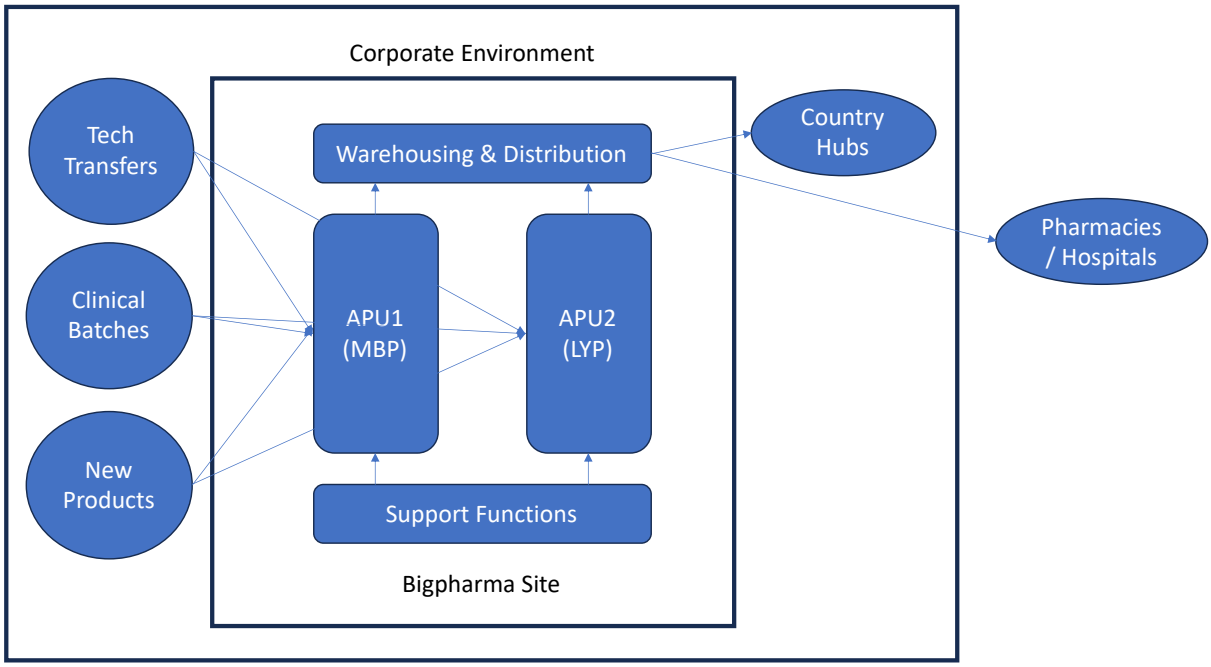


Figure 6. 1: 'BigPharma' Site within Corporate environment

As shown in Figure 6.1 within the ‘BigPharma’ site there are two separate Autonomous Production Units (APUs). These units maintain as much functional responsibility as is economically feasible, to maximise accountability with the APU business leaders. Common functions that support both APUs include procurement, artwork, data management, warehousing and distribution. Customer shipments go to internal corporate hubs in markets around the world as well as direct shipments to pharmacies and hospitals in smaller markets that do not have such hubs.

Over the years ‘BigPharma’ have earned a reputation as a reliable supplier of high quality product. This perspective is supported by over twenty years of high performance KPIs in the areas of quality, service and cost, and a track record that has seen the site grow its footprint ten fold in that same period. From discussions with the two IBP process leaders, they described that based on this solid foundation the leadership team have always taken a proactive approach in the development of their own site strategy, ensuring it is aligned to the corporate strategic direction. This has afforded ‘BigPharma’ a level of autonomy within the company to propose product transfers into and out of the site while optimising its capability for future growth. This has enabled ‘BigPharma’ to evolve over the years from being a purely tableting site, to a manufacturer of strategic biologics drugs for the corporation. The site strategy is formally reviewed annually and is detailed in roadmaps for the next five years, with the longer-term strategic direction documented up to ten years. In addition, a quarterly Strategy Management Review (SMR) forms part of the site governance process, ensuring that any proposed adjustments to the strategic plan during a given year, driven by latest IBP plans, can be assessed.

The company strives to create a consistent corporate culture through the promotion of a set of corporate values for all sites to embrace. These values include teamwork, courage, respect and integrity. In addition the defined values encourage taking action, stretching themselves when setting targets and always guided by what is right for the patients, customers and the corporation.

The strategy for the manufacturing site at ‘BigPharma’ is formally updated annually in conjunction with the annual corporate update cycle. The output, called the ‘strat plan’, is essentially a detailed plan of products, volumes, strategic projects, financials, strategic KPIs set out over a 5 year horizon. Overall strategic direction is provided by a set of three Compelling Business Needs (CBNs) which provide the overall strategic direction for the site and act as guiderails on what strategic activities they should engage in.

To align the organisation with the site growth strategy, in 2016 'BigPharma' turned to the S&OP/IBP process as a structured governance process for deploying the strategy and ensuring that key longer-term decisions (up to a 36 month horizon) were aligned to the strategic goals of the business (as per definition covered in Chapter 1). Over the next 2 years a comprehensive programme of education and workshops structured an IBP process for the 'BigPharma' business, resulting in a monthly set of formal reviews as shown in Figure 6.2.

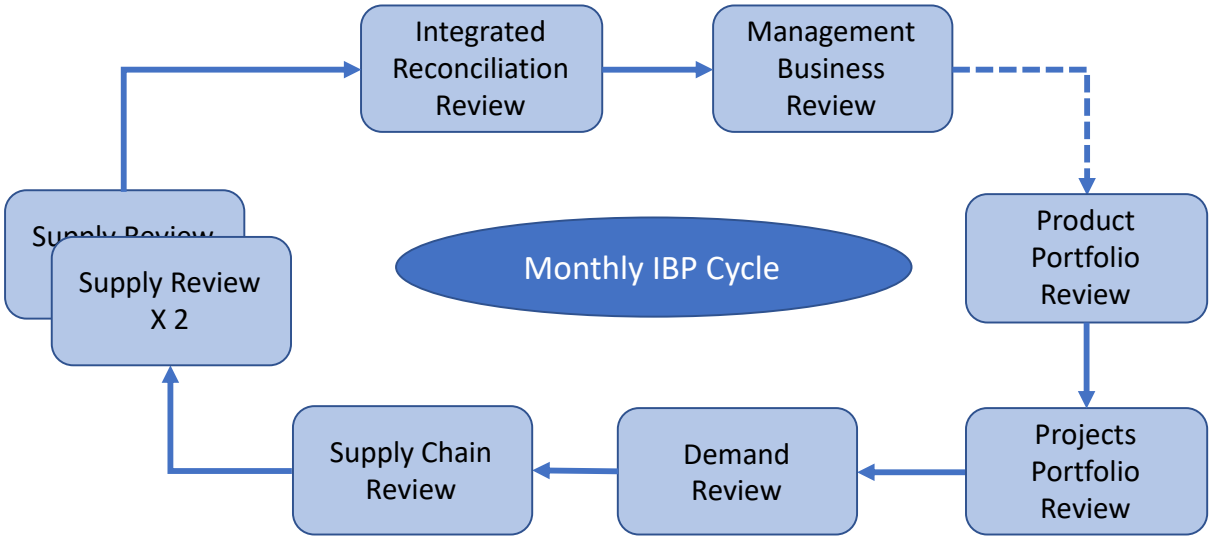


Figure 6. 2: Monthly IBP Cycle at 'BigPharma'

In November 2020 'BigPharma' received formal certification as reaching Class A IBP level of maturity by consulting company, Oliver Wight (Wight, 2018). One of the key assessment criteria for achieving the Class A capability is to ensure strategic alignment is achieved when operating the IBP process (Wight, 2017).

As part of designing the process to meet the business needs the standard IBP process as described in Chapter 1, was adapted by 'BigPharma' to include a dedicated review for strategic projects management. This was in recognition of the importance of key projects, including a comprehensive digital transformation programme, to position the future capability of the site. In addition, the supply step was split to align with their two business unit (APU) organisation structure. The common supply activities that support both APUs (Autonomous Production Units) are covered in the Supply Chain Review. This review covers activities such as warehousing, artwork generation, purchasing and data management.

As a supply site 'BigPharma' do not have any commercial responsibility. Therefore, the Demand Review step of the process concentrates on the demand plan for the site. Links to the key markets are maintained to source market intelligence and also provide valuable updates back to the markets on product supply related issues.

As part of the process of designing and implementing the IBP process at 'BigPharma', the standard education provided was not just limited to the mechanics of the process but also included the IBP principles to support the required behaviours in the reviews (Oliver Wight International, 2016). The principles embraced by 'BigPharma' are reflected in the checklist they use for self-assessment at the end of each review meeting (Table 6.1).

Table 6. 1: IBP Principles at 'BigPharma' (as per their review meeting checklist)

IBP Principle	Intent of Principle
Decision Making	Recognise that value from the process is achieved though decision making
Planning based on demonstrated performance	Future plans should be reflective of the historical trend in performance
Appropriate time horizon (4-36 months+)	Discussions should relate to the longer-term planning horizon
Winning behaviours	Evidence that corporate values and behaviours are embraced
Truth as we know it	Provide honest input to plans based on what you factually know
Roughly Right	Longer-term plans should be aggregated to increase accuracy
Silence is approval	If you don't speak up then approval is assumed
Good/Bad news early	Bring important information that could affect future plans to the review as soon as it is available
Effective use of time	Time spent on the critical issues and decisions to support future plans

By ensuring that every review meeting is concluded with a collective scoring against the checklist, 'BigPharma' recognise that the maturity of their IBP process is directly related to their ability to maintain the discipline of the monthly drumbeat of the process, while ensuring the review teams embrace the IBP principles in how they engage the process.

A dedicated role orchestrates the monthly IBP process. At the time of the case study there were two IBP Process Leaders in place as part of a transition of responsibilities from the leader who had been in place for six years to a new IBP Process Leader. The new Process Leader had been promoted from within the IBP process having previously been the facilitator

of the Strategic Projects Review. As part of the role of the IBP process leader, the scores from the self-assessment were captured and trend charts were created to reflect on areas where interventions may be required to address trends that were not in line with expectations. With the recruitment of a SA exemplar case study business, the research environment of enabling the researcher to observe the monthly IBP process was enabled. The structured data capture and data analysis approaches as described in Chapter 3 (Research Methodology) were instrumental in establishing the key findings, interpretations and ultimately evolution of the Conceptual Framework from CF3 to CF4, as presented in the following sections.

6.2 Findings

The critical realism research philosophy was most evident in the case study analysis. It was essential through observing the IBP live reviews and subsequent targeted interviews, that the researcher was able to get beyond the narratives in the reviews to understand the causal mechanisms. This then supported comparisons to be made to the CF3 propositions to conclude whether the exemplar case study structures, mechanisms and behaviours were reflected adequately by CF3.

In this section significant findings related to the RPs are described. As referenced earlier (Chapter 3 Section 3.3.2) these findings emerged from the initial analysis of data captured across the three cycles observed (24 IBP reviews + 24 Presentation Packs) and 11 semi-structured interviews. In addition the contextual information captured through discussions with the IBP process leaders supported the understanding of the scope of the IBP process.

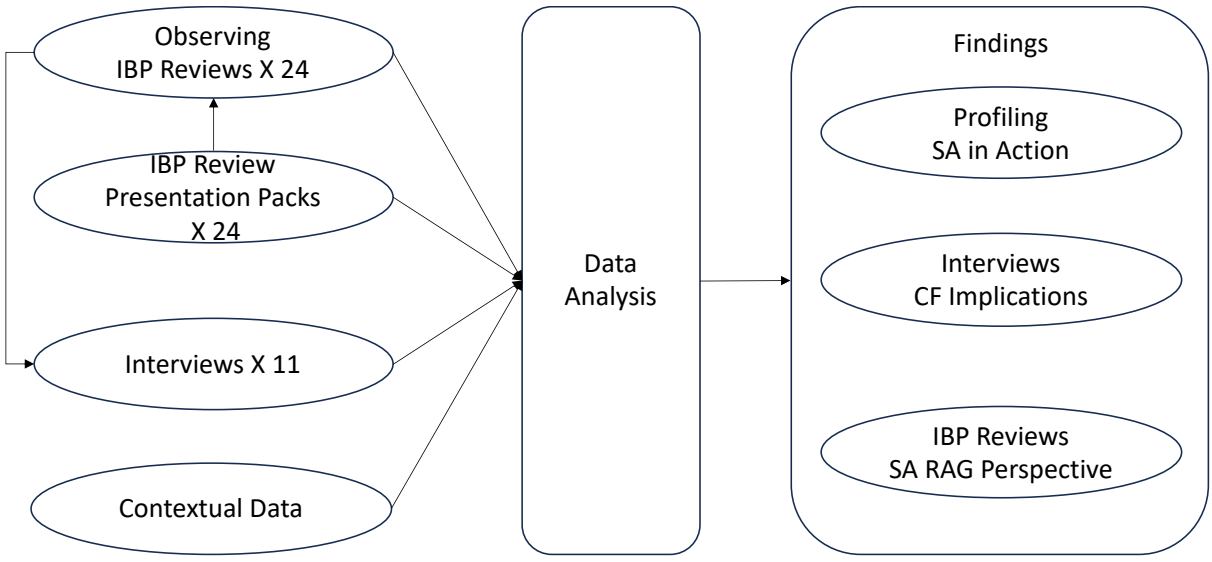


Figure 6. 3: Process Flow showing Sources and Outputs of initial data analysis

As shown in Figure 6.3 the initial data analysis produced three main finding areas:

1. Profiling SA in Action: Leveraging customised effect matrices to pattern match observations made to the elements of CF3, when SA was observed.
2. Interviews CF Implication: Using Thematic Analysis (TA) techniques to extract key knowledge, that has implications to CF3, from the interview narratives.
3. IBP Reviews SA RAG Perspective: Through observations of when and where (which review) SA discussions / decisions occurred, a RAG perspective was assigned to the presence of each of the CF3 elements in each of the reviews observed.

Each of these finding areas are explored in the following sections (6.2.1-6.2.3).

6.2.1 Profiling Strategic Alignment in Action ('SA in Action')

As *pattern matching* was selected as an appropriate analytical approach, a crucial requirement of the research process was to observe when SA was achieved and to match the evidence that showed the presence of supporting elements of the conceptual framework. This evidence based assessment was built over the three review cycles. The use of RAG status in each cycle illustrates this, as shown in Figure 6.4, taking the Demand Review as an example. As more knowledge and understanding was gleaned through each cycle the RAG status evolved accordingly.

		Demand		
CF Structure	**Conceptual Framework Element**	**Cycle 1**	**Cycle 2**	**Cycle 3**
Contingency Variables	Scope			
	Education			
	Strategic Plan			
	Horizon			
	Maturity			
Response Variables	Product Portfolio Management			
	Strategic KPIs			
	Integrated Business Plan			
	Financial Integration			
	Scenario Planning			
Growth Mindset	Growth Mindset			
Feedback Loop	Feedback Loop			
Performance Variable	Strategic Decision Making			
Planning Hierarchy Poisitioning	Link to SM Review			
	Link to Ops Planning			

Figure 6. 4: Illustration of Review RAG status evolution from Cycle 1 to 3 (Demand Review)

Note that the evolving RAG status for each review along with the supporting evidence are shown in Appendix 6.5.

An early observation highlighted that making strategic decisions was not the only indicator of SA. On many occasions, there were value add strategic discussions during the review meetings discussing potential gaps in the latest plans relative to the strategic plan. Such discussions prompted alignment discussions among the cross functional participants. To provide an illustrative example of the SA phenomenon observed, but no strategic decision being made, a discussion was logged from the product review meeting in the first cycle as follows:

⇒ An update was provided by a Product Manager on the product related projects (new products and technical transfers) for their particular technology platform. In this case it was the MB platform (real platform name coded to preserve anonymity).

⇒ It showed the changes to the plan since the last cycle on key projects over a horizon to the end of 2025 (almost 3 years).

⇒ The reasons for the changes were explained and alignment was sought across the team.

⇒ One specific change was related to PPQ (Product Process Qualification) batches that had been scheduled for Q3 2023 but now had to be moved to Q3 2024 due to extra data requested by EU/FDA regulators.

⇒ The senior financial representative (FINPAR1) challenged whether the shift in PPQ builds could have an impact to what had been committed in the long-term strategic plan (called ‘strat plan’ by ‘BigPharma’), in particular related to financial planning.

⇒ A strategic discussion ensued as to whether the corporate product team would financially compensate the ‘BigPharma’ site for the schedule change. The discussion progressed to whether there was a strategic opportunity to plan replacement batches avoiding an impact to site performance, as measured by Cost/unit.

⇒ As all the information was not available at the time of the review, actions were taken to assess the impact and decide what changes would need recommending for ‘strat plan’ adjustment.

This example shows that strategic discussions were conducted in the review with a perspective on closing gaps between the IBP plan and the strategic plan, as defined in Chapter 1 (Figure 6.5 repeated here for clarity):

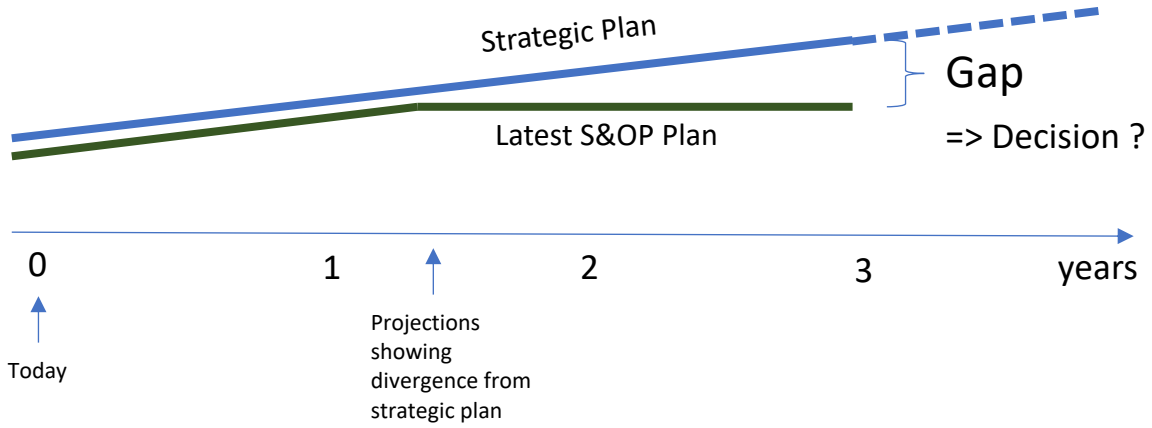


Figure 6. 5: Repeat of Figure 1.4 from Chapter 1 to show objective of 'SA in Action'

In this particular example, no strategic decision was made at that point in the review meeting due to the need for more information. However, the strategic discussion that prompted the actions taken could only have occurred when the data was presented in a clear manner, over the longer-term horizon. The comparison to the strategic plan expectations enabled proactive discussions and actions taken, even though the ultimate gap closing decision was deferred until more data was gathered.

This early insight expands on the Delphi Study findings which concluded SA is manifest where Strategic Alignment (SA) decisions are made. While the observation does not negate this, it expands upon it to include 'SA Discussions' as an indication of SA. This insight triggered an update to the research design protocol (Rev 3.0) to not just identify when SA decisions were being made but also when SA discussions occurred.

Therefore, in analysing 'SA in Action' the observed phenomenon was aligned to instances of both strategic discussions occurring as well as strategic decisions being made. Recognising that any SA decision would have been preceded by a SA discussion, to ensure that categories were mutually exclusive, anytime an observation was categorised as a 'SA Decision', it was not also categorised as a 'SA Discussion', for any given review meeting. However this did not preclude a 'SA Discussion' being captured in a particular review that subsequently ended as a 'SA Decision' in the Management Business Review (MBR) meeting for instance.

The pattern matching approach also identified when there should have been 'SA Discussions' but as it transpired no such discussions occurred. This was based on the data presented when there were gaps versus the strategic plan but SA discussions were not triggered. Recognising the important insights that could come from such observations two additional categories were added to the research protocol (rev 3.0) to seek out instances of 'Missed Discussions' and 'Missed Decisions'. The criteria for establishing each of these is shown in Figure 3.7, in section 3.3.3.

The next step in the analysis investigated which elements of the CF were evident when categories of 'SA in Action' were recorded. This provided a profile of 'SA in Action' tied to the key elements of the CF. Over the course of the study, 57 observations of 'SA in Action' (including instances of missed SA discussions/decisions) were created and when aggregated they provided 11 key insights that were profiled relative to the existing CF. The key statistics related to this activity are shown in Figure 6.6.

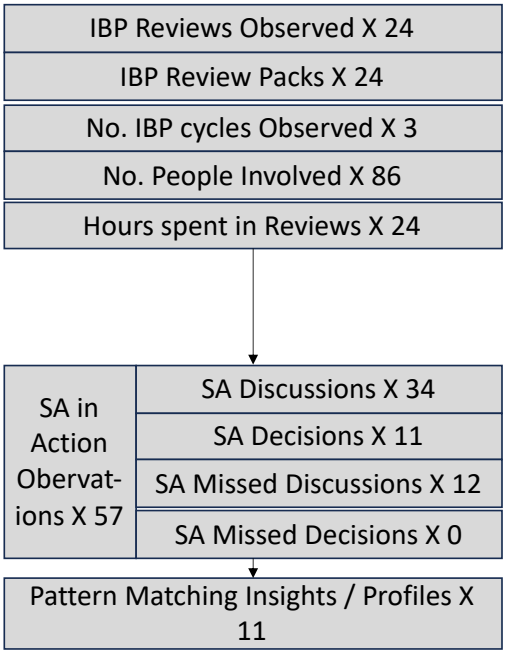


Figure 6. 6: Statistics related to 'SA in Action' profiling

All 57 of the 'SA in Action' observations are listed in Appendix 6.4.

Figure 6.7 shows how many of the observations related to each key insight and associated 'SA in Action' category.

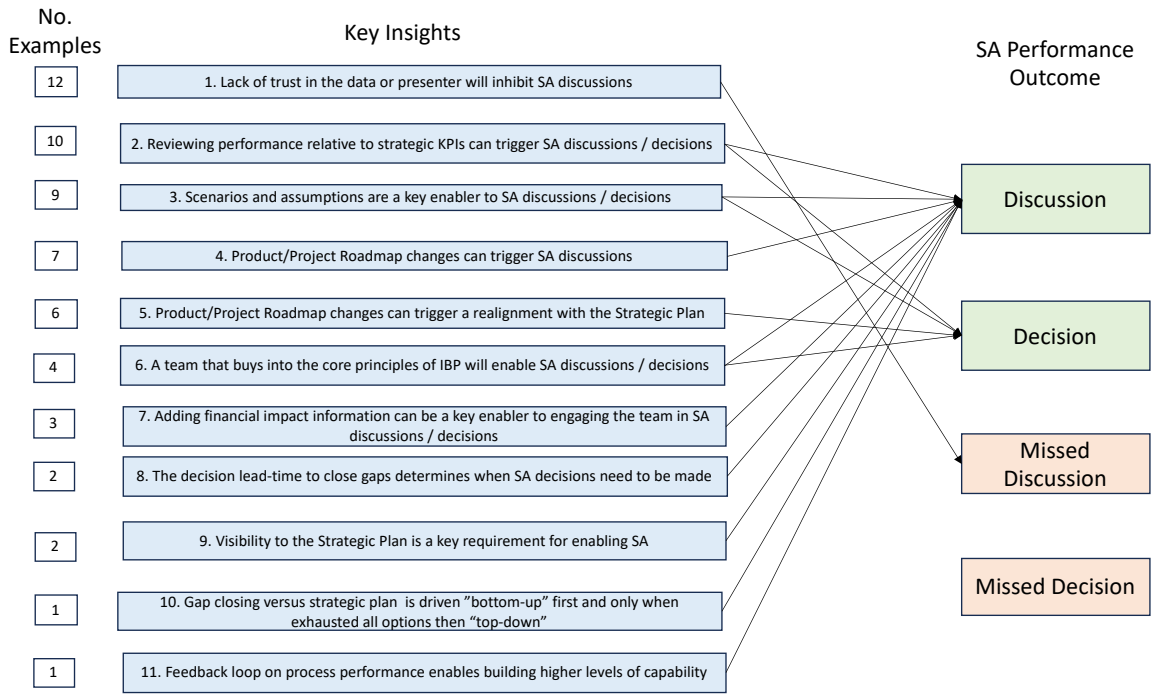


Figure 6. 7: Number of 'SA in Action' observations tied to key insights and SA categories

Insights are ranked based on the number of observations that related to a given insight. Interestingly the highest ranked insight related to 'missed discussions', where insights emerged when analysing the aspects of the CF evident, or missing, in those situations.

A cluster of SA observations related to the Product / Projects Portfolio review meetings (13 observations across insights No. 4 & 5). This indicates the importance of these reviews in the context of SA. This is discussed further in section 6.2.2.

Over the three cycles there were no "missed decisions" recorded. That is to say there was no situation where the researcher could observe that the team failed to make a decision that was suggested by the data and discussions. As an organisation operating a mature IBP process it is reasonable to expect that such situations may be rare but based on the number of "missed discussion" examples one could expect that if the case study had been extended over many more cycles, examples of 'missed decisions' could have emerged. However, in the context of addressing the RQs, the insights provided through observing 'missed discussions' would likely match what would be observed in a 'missed decision', recognising that every decision is preceded by a discussion. Therefore, this was not considered a limitation to achieving data saturation.

In structuring the observations, an effects matrix (Miles and Huberman, 1994) was designed to identify the key factors enabling SA.

The effects matrix template is shown in Figure 6.8.

Business Perspective (What / Where / Who)	What was Observed			Evidence
Strategic Discussion / Strategic Discussion / Missed Decision / Missed Discussion	Describe what researcher observed in the review meeting.			Specific references to data presented, quites from review attendees to support observation made
Research Perspective (Why)	**Insight**	**CF Pattern Matching to the Review Meeting**		**Primary CF Relationships Engaged**
Strategic Discussion / Strategic Discussion / Missed Decision / Missed Discussion Review ? / Cycle ? Obervation No. ?	Summarise the key insight interpreted	Contingency Variables	Which elements were eveident or not - provide summary RAG colur coding	Diagram showing which specific aspects of the CF were evident associated with this insight.
		Response Variables	Which elements were eveident or not - provide summary RAG colur coding	
		Growth Mindset	Which elements were eveident or not - provide summary RAG colur coding	
		Feedback Loop	Which elements were eveident or not - provide summary RAG colur coding	
		Performance Variable	Which elements were eveident or not - provide summary RAG colur coding	

Figure 6. 8: Effects Matrix template for analysing 'SA in Action'

The matrix is split into two major sections. The top section summarises what was observed directly in the review meeting with evidence to support the conclusion on the SA observation (dependent variable shown in the first column of the matrix). The evidence includes direct quotes from the review participants and a reference to the specific slides in the review presentation packs. The bottom section takes the CF perspective, aligning to the key insights and matching to the various elements of the CF, including a RAG status aggregated view for each of the major constructs of the CF (independent variables). A diagram is also included (far right column) to summarise the CF elements evident for the specific 'SA in Action' observation.

Each of the insights are described below. The relevant effects matrix is shown (Figures 6.9 to 6.19) before describing each insight, using an example from the observations.

Insight 1: Lack of trust in the data or presenter will inhibit SA discussions

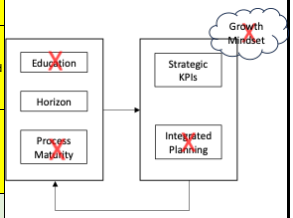
Business Perspective (What / Where / Who)	What was Observed			Evidence
Missed Discussion mAbs Supply Review / Cycle 2 (Obervation No. 26)	QAL presented projected capacity charts showing loadings of 122% and 200% for 2024/ and 2025 resepctively. The information was presented without any commitment to the data or tangible plans to resolve projected issues into the future. Resulted in strong pushback from the team to review the models and ensure can present with total accountability over the full horizon projections. Sense of frustration from the other team members. Loss of time discussing the process to produce the information rather than focusing on the information.			Capacity loading for QP at 122% for 2024 and 200% for 2025. Gap Closing Action as "N/A" (Ref: 46 of 82). "I don't understand the graphs and how we are doing this" - MBOCHA1.
Research Perspective (Why)	**Insight**	**CF Pattern Matching to the Review Meeting**		**Primary CF Relationships Engaged**
Missed Discussion mAbs Supply Review / Cycle 2 (Obervation No. 26)	1. Lack of trust in the data or presenter will inhibit SA discussions	Contingency Variables	Scope / Strategic Plan / Horizon - **Match** Education / Maturity - **Partial Match** The Quality function have not been educated on the process and importance of SA. Impacting on the overall maturity of the IBP process step for engaging with longer term SA type discussions.	
		Response Variables	Product Portfolio / Strategic KPIs / Scenarios - **Match** Integrated Plan / Financial Integration - **Partial Match** The inability to align around the projections presented by the Quality function prevents a truly integrated plan being achieved. Financial Integration beyond the budget window is not an essential ingredient into the SA discussions.	
		Growth Mindset	Quality Function - **No Match** Rest of team - **Match** While overall the team appreciate the importance of longer term projections, discussions and decisions, the lack of trust in the Quality information impacts on the collective growth mindset to enable SA discussions and potential decisions.	
		Feedback Loop	Feedback Loop - **Match** The self assessment conducted at the end of the review provides feedback on areas that require to be revisited and promted the team to put a focused education programme together for the Quality function.	
		Performance Variable	Performance - **No Match** As it relates to a critical projection of capacity requirements from the Quality function, SA discussions were inhibitiued by the lack of trust in the data/presenters resulting in process discussions rather than SA business discussions.	

Figure 6. 9: Effects Matrix for Insight 1: Lack of trust in the data or presenter will inhibit SA discussions

There were 12 observations that related to situations observed where SA discussions should have been engaged but they were not. This insight highlighted where elements of the conceptual framework (CF3) were not in play, which prevented the team engagement required for SA discussions. For the majority of the observations there was one particular organisation (Quality) at the heart of these discussions. What became clear is that the Quality representatives (QAL*) were not sufficiently educated on the expectations of the process. This affected the team dynamic when it came to enabling SA discussions.

In this example, one of the QAL representatives presented capacity charts in the MBO supply review with a loading of 122% and 200% for the years 2024 and 2025 respectively. The bigger concern was there was no tangible plan to resolve the significant gap versus the strategic capacity loading target of 85%. This triggered a sense of frustration among the team which resulted in discussions on how the QAL* representatives could better engage the process. Essentially the team reverted to informing the QAL* representatives on how to present data and how to demonstrate accountability in the reviews. Due to the lack of trust in the information presented (see quote from MBO_CHA1 in Figure 6.9), no business discussions were conducted to determine future actions and potentially formulate some decision scenarios.

In terms of pattern matching, the need for more education was a key contingent variable gap for the QAL* representatives. Also, the whole quality function, as observed, was not at the

level of maturity versus the rest of the team. In turn by presenting a plan that was not received as credible meant an 'integrated plan' response variable was compromised. Most significantly the team dynamic of building a 'growth mindset' was impacted due to the lack of trust in what the QAL* representatives presented. The role of the feedback loop was highlighted with the action taken by the IBP leader (IBP_LED1) to develop a focused intervention of education for the QAL* team.

The summary diagram for insight 1 shows the main elements of CF3 in play with an 'X' indicating that the specific element was not at the level required for SA.

Insight 2: Reviewing performance relative to strategic KPIs can trigger SA discussions / decisions

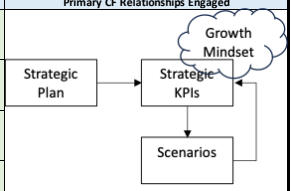
Business Perspective (What / Where / Who)	What was Observed		Evidence
Strategic Discussion Steriles Supply Review / Cycle 2 (Observation No.22)	A speciifc manufacturing platform LYP capacity operating above strategic target of 85% but below 100% in projections - presentation of two opportunities to bring it down. Problem continues into 2024 and comes down in 2025. Discussion on how to address capacity in 2024 due to demonstrated performance of lost fills.		"Hate living on plans that show 90%+ capacity loading - give it another couple of months and then need to make a decision on how address 2024" - SPOCHA2. "Will require escalation through GSC" - SPOFAC1. (Ref: 14-15 of 67)
Research Perspective (Why)	**Insight**	**CF Pattern Matching to the Review Meeting**	**Primary CF Relationships Engaged**
Strategic Discussion Steriles Supply Review / Cycle 2 (Observation No.22)	2. Reviewing performance relative to strategic KPIs can trigger SA discussions / decisions	Contingency Variables: Scope / Education / Strategic Plan / Horizon / Maturity - **Match**. All elements evident. Response Variables: Product Portfolio / Strategic KPIs / Integarted Plan / Financial Integration / Scenarios - **Match.** All elements evident. Growth Mindset: Full Team - **Match.** Srong caapbility evident from the collective team with clear "growth mindset" evident. Feedback Loop: Feedback Loop - **Match.** Disciplined approach to self assessment scoring at the end of each review meeting and reinforement of actions to be taken to continuously improve. Performance Variable: Performance - **Match**. Strategic Discussion conducted. Discussion brought intelligence to the table based on demonstarted performance of filling failure rates leading to a conclusion that a strategic decision to bring back in line to the startegic target of 85% did not need to be made at that point.	

Figure 6. 10: Effects Matrix for Insight 2: Reviewing performance relative to strategic KPIs can trigger SA discussions / decisions

It was observed that projecting the performance of strategic Key Performance Indicators (KPIs) proved a very effective way to trigger SA discussions and decisions.

In the example shown, a key strategic KPI of Capacity Loading for 'BigPharma' was leveraged when discussing future capacity risks associated with a key manufacturing platform (LYP). The strategic target is set at 85% to allow for recovery from potential unplanned disruptions while maintaining supply. In this case the future projections showed a loading of 90%. This triggered a SA discussion with agreement that these should be monitored for another few cycles. If the data continued to project >85% loading it was agreed that action would be taken to increase the capacity, which would require escalation to the MBR for decision making.

There were 10 observations associated with leveraging strategic KPIs over the 3 cycles. This reinforced the importance of the response variable of 'Strategic KPIs' in CF3.

Insight 3: Scenarios and assumptions are a key enabler to SA discussions / decisions

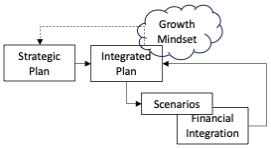
Business Perspective (What / Where / Who)	What was Observed		Evidence
Strategic Decision Made Management Business Review / Cycle 3 (Observation No.51)	3 X Scenarios presented for capacity projection crunch on PFS Inspection. Recommendation on sceanrio 3 accepted. Financials of impact over time presented for each scenario which appeared to be a vital aspect, linking back to discussions in IRR when preparaing the scenarios for decision making. There was sufficient confidence across the team in what was presented to progress with decision.		"Still on track to fully automate process for 2025 with corresponding reduction in 30 H/C?" - SLTCHA1 - Agreed. "Decision we have made to add 4 X people to inspection is fine and will need to be posiiotned through 2024". SLTCHA1. "Will have an impact to Strat Plan that will be communicated at next review but clearly necessary" - SLTPRJ1. (Ref: 37-38 of 61)
Research Perspective (Why)	**Insight**	**CF Pattern Matching to the Review Meeting**	**Primary CF Relationships Engaged**
Strategic Decision Made Management Business Review / Cycle 3 (Observation No.51)	3. Scenarios and assumptions are a key enabler to SA discussions / decisions	Contingency Variables: Scope / Strategic Plan / Horizon - **Match.** Education / Maturity - **Partial Match.** Some leaders identified as needing education (Quality & MBO Platform) but specific decision did not involve them and decision progressed. Relatively new leadership team reflective of time spent on process discussions and clarifying expectations from the SLTCHA1.	
		Response Variables: Product Portfolio / Strategic KPIs / Integarted Plan / Financial Integration / Scenarios - **Match.** Integrated Plan - **Partial Match.** Lack of confidence in the Quality data projections prevents a truly integrated plan. The aspect of the plan under review for decision was not affected by the Quality data.	
		Growth Mindset: Quality Function - **No Match** Rest of team - **Partial Match** Senior team seem to be finding their feet as an integrated team. While evryone seems to appreciate the need for longer term planning through IBP, as a new team there is a strong emphasis on the Chair (SLTCHA1) to drive the SA type discussions.	
		Feedback Loop: Feedback Loop - **Match.** Disciplined approach to self assessment scoring at the end of each review meeting and reinforement of actions to be taken to continuously improve.	
		Performance Variable: Performance - **Match.** Strategic Decision Made. With clear scenarios presented and financial implications clear, after an open discussion, a decision was made.	

Figure 6. 11: Effects Matrix for Insight 3: Scenarios and assumptions are a key enabler to SA discussions / decisions

Of the 9 observations that related to this insight, the example selected (from observation no. 51) relates to tiggering a SA decision during the executive Management Business Review (MBR). This is the highest escalation point in the IBP process. Hence, one would expect it is where most decisions would get made. However, interestingly some of the CF3 elements for the MBR had a RAG status of amber and yet a SA decision was made.

In the example, an ongoing capacity gap associated with a key inspection step in the process was projected out through 2024 before a key strategic project enabling automatic inspection would deliver a new capability. Three scenarios were prepared including the financial impact associated with each scenario. Based on the clarity of the information and confidence in the robustness of the data, a quick decision was made by the team to select one of the scenarios, which required adding headcount to the inspection stage. The team recognised that the strategic decision, while necessary, would mean a misalignment with their 'strat plan' in terms of headcount commitment and so it was actioned that they would need to confirm the new required headcount number for the interim period to corporate.

From a CF3 pattern matching perspective the contingency variables of education and maturity drove the amber RAG status. The leadership team had changed quite significantly over the previous year, including a new Managing Director (MD) and there was evidence of the team still going through the maturity ramp. An example of this from observations made through the first 2 cycles was the level of prompting that was required by the MD to encourage cross functional discussions. From an education perspective the Quality executive was identified along with her entire function for targeted education. While in this example these less than ideal contingency variables did not impact on the decision, the overall integrated plan remained in question due to the lack of confidence in the QAL* information. This in turn impacted on the overall growth mindset of the team as evidenced by the process (as opposed to business) discussions that were triggered when the executive responsible for Quality (QAL_SLT1) presented information. The overall 'growth mindset' of the team still prevailed with the acknowledgment of what needed attention when conducting the end of review feedback. This included a targeted education programme for the quality organisation involved in IBP. However, because the quality function were not a factor in the discussion of this example, they were not an inhibitor to a strategic decision being made.

The summary diagram reflects the importance of scenarios that have the associated financial implications to the business captured, to trigger a decision, while also showing that when this decision creates a misalignment with the strategic plan, it necessitates an update to the strategic plan accordingly.

Insight 4: Product / Project Roadmap changes can trigger SA discussions

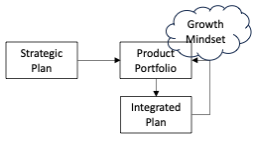
Business Perspective (What / Where / Who)	What was Observed			Evidence
Strategic Discussion Demand Review / Cycle 2 (Observation No. 4)	An update on a corporate project that looks to be approved that will move final assembly activities into a key market, drove a discussion on actions required to ensure a revised integrated plan into the future.			Review of new market shipping formats - repacking of 4-Zy products in China - could be big cost saving for the company - corporate strategy alignment (30 of 66). "Looks like this project is going to be approved - will need all functions to understand the implications and align accordingly" - DEMCHA1
Research Perspective (Why)	**Insight**	**CF Pattern Matching to the Review Meeting**		**Primary CF Relationships Engaged**
Strategic Discussion Demand Review / Cycle 2 (Observation No. 4)	4. Product/Project Roadmap changes can trigger SA discussions	Contingency Variables	Scope / Education / Strategic Plan / Horizon / Maturity - **Match**. All elements evident.	
		Response Variables	Product Portfolio / Strategic KPIs / Integarted Plan / Financial Integration / Scenarios - **Match.** Strategic KPIs: **Patrial Match.** Forecast Accuracy measured but not controlled by site - in process of moving to net demand perspective where measure will be more under site control.	
		Growth Mindset	Full Team - **Match.** Srong capability evident from the collective team with clear "growth mindset" evident.	
		Feedback Loop	Feedback Loop - **Match.** Disciplined approach to self assessment scoring at the end of each review meeting and reinforement of actions to be taken to continuously improve.	
		Performance Variable	Performance - **Partial Match.** Strategic Discussions conducted but no Strategic Decision Made due to ownership for the demand plan with commercial. Demand team providing valuable information triggering strategic actions for the other reviews to consider. Moving towards making strategic decisions once complete project to track net demand as well as gross demand.	

Figure 6. 12: Effects Matrix for Insight 4: Product / Project Roadmap changes can trigger SA discussions

It was evident that projected changes to the product or strategic project roadmaps triggered SA discussions in the review meeting observed. The roadmaps defined the latest projected deliverables of the projects over the longer-term horizon and enabled a direct comparison versus the expectation defined in the strategic plan ('strat plan').

In the example shown Observation No. 4 relates to a strategic discussion in the Demand Review meeting of cycle 2. Through engagements with the markets the demand team had received visibility of a corporate project to move some final assembly activities from the 'BigPharma' site to the China market for shipments destined for that market. The motivation was based on optimising corporate profitability. This triggered a cross functional strategic discussion as to the implications across all functional plans should this happen. Actions were triggered to prepare a perspective on the impact to the integrated plans on the basis that it looked highly likely that the corporate project would progress.

There were 7 observations over the three cycles that supported the importance of product / project portfolio management such that changes to the future product/project roadmaps would trigger SA discussions. These observations triggered a reflection on the importance of reviewing the strategic projects portfolio as well as the product portfolio, as an enabler to 'SA in S&OP'.

Insight 5: Product / Project Roadmap changes can trigger a realignment with the Strategic Plan

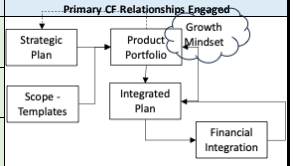
Business Perspective (What / Where / Who)	What was Observed			Evidence
Strategic Decision Made Product Review / Cycle 2 (Observation No.36)	Proposed key changes to the Product Roadmap following a number of months working through issues with a delay in a key ingredient for a new product variant. Delay will impact launch of the variant in Europe and the US and will have impact to the alignment of resources in house and so important that everyone is aligned with the change and agrees with the decision. The change requires an unavoidable update to the Strategic Plan.			"At this point this change has to be made to the product roadmap and so need to loop back to align the strategic plan with corporate accordingly" - PROCHA1. (Ref: 17 of 46).
Research Perspective (Why)	**Insight**	**CF Pattern Matching to the Review Meeting**		**Primary CF Relationships Engaged**
Strategic Decision Made Product Review / Cycle 2 (Observation No.36)	5. Product/Project Roadmap changes can trigger a realignment with the Strategic Plan	Contingency Variables	Scope / Education / Strategic Plan / Horizon / Maturity - **Match**. All elements evident.	
		Response Variables	Product Portfolio / Strategic KPIs / Integarted Plan / Financial Integration / Scenarios - **Match.** All elements evident.	
		Growth Mindset	Full Team - **Match.** Srong caapbility evident from the collective team with clear "growth mindset" evident.	
		Feedback Loop	Feedback Loop - **Match.** Disciplined approach to self assessment scoring at the end of each review meeting and reinforement of actions to be taken to continuously improve.	
		Performance Variable	Performance - **Match.** Strategic Decision Made. Updated Product roadmap endorsed by the Product Review Team and confirmed that will require an update to the Strategic Plan to ensure alignment.	

Figure 6. 13: Effects Matrix for Insight 5: Product / Project Roadmap changes can trigger a realignment with the Strategic Plan

It was observed during the cycles that when changes were made to the product/projects roadmaps then these in turn could trigger changes to the strategic plan.

In the example shown from Observation No.36, during the Product Review meeting from cycle 2, a planned product launch into the key markets of Europe and US had to be moved from 2024 into 2025, due to the lack of availability of a key ingredient. Having exhausted all actions, there was an acknowledgement that the roadmap had to be updated and in turn this would require a 'strat plan' realignment with corporate.

There were 6 observations over the three cycles that showed that 'BigPharma' had influence over triggering updates to the strategic plan ("top-down") once all actions had been exhausted to maintain the product roadmaps ("bottom-up"). This provided further clarity for how the IBP planning process interacted with the strategic planning process in the context of the planning hierarchy.

Insight 6: A team that buys into the core principles of IBP will enable SA discussions / decisions

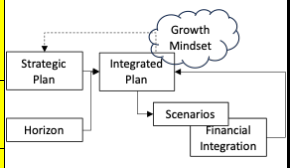
Business Perspective (What / Where / Who)	What was Observed			Evidence
Strategic Decision Made Management Business Review / Cycle 2 (Observation No.34)	By facing the reality of the performance of the Zwick (2 on site but one in repair and so offline for a number of months) with it also being a key point of failure for many products, drove a business continuity discussion to invest in a 3rd machine.			QC - Zwick - capacity showing green but SLTCHA1 asks: " I feel we are at risk with Zwick - does anybody else share this feeling?" - SLCHA1. Response from SLTMFG2 "I agree one has been down for 3 months , leaving us with one that if it goes down we are in trouble" . Action taken to evaluate the option of buying another Zwick (250K) - based on continuity planning. (Ref: 43 of 47).
Research Perspective (Why)	**Insight**	**CF Pattern Matching to the Review Meeting**		**Primary CF Relationships Engaged**
Strategic Decision Made Management Business Review / Cycle 2 (Observation No.34)	6. A team that buys into the core principles of IBP will enable SA discussions / decisions	Contingency Variables	Scope / Strategic Plan / Horizon - **Match.** Education / Maturity - **Partial Match.** Some leaders identified as needing education (Quality & MBO Platform) but specific decision did not involve them and decision progressed. Relatively new leadership team reflective of time spent on process discussions and clarifying expectations from the SLTCHA1.	
		Response Variables	Product Portfolio / Strategic KPIs / Integarted Plan / Financial Integration / Scenarios - **Match.** Integrated Plan - **Partial Match.** Lack of confidence in the Quality data projections prevents a truly integrated plan. The aspect of the plan under review for decision was not affected by the Quality data.	
		Growth Mindset	Quality Function - **No Match** Rest of team - **Match** Senior team seem to be finding their feet as an integrated team. While evryone seems to appreciate the need for longer term planning through IBP, as a new team there is a strong emphasis on the Chair (SLTCHA1) to drive the SA type discussions.	
		Feedback Loop	Feedback Loop - **Match.** Disciplined approach to self assessment scoring at the end of each review meeting and reinforement of actions to be taken to continuously improve.	
		Performance Variable	Performance - **Match.** Strategic Decision Made. Collective growth mindset able to carry forward despite one function (Quality) lacking same mindset. Leads to proactive decision to protect the business against a single piint of failure despite the integrated plan indicating that the business was fine with 2 X Machines.	

Figure 6. 14: Effects Matrix for Insight 6: A team that buys into the core principles of IBP will enable SA discussions / decisions

Four observations aligned to this principle. One of these (observation no.34), from the second cycle, observed an executive team discussion at the MBR. This was triggered by a recognition of a single point of failure for the range of their most critical products. The

machine that was used for testing had a history of breaking down. Even though they had two such machines, the future capacity requirements showed the need for both to be operational. After some discussion the exec team decided to minimise the risk to business continuity and invest in a third machine. This illustrates a longer-term growth focus to deliver on the strategic imperative of continuous supply of critical pharmaceutical drugs. Interestingly, on paper there was no gap to the strategic plan that prompted a gap closing action. However, when the demonstrated performance of one of the existing machines was considered, a realistic projection indicated that a backup machine was required to avoid potential supply issues due to breakdowns. The executive team were empowered to make this decision but still recognised the need to build the financial case and align it with the strategic plan by reviewing with corporate.

Even though it had been observed that the Quality function were not at the same level as the rest of the executive team in terms of growth mindset and the overall executive team were still building in terms of maturity, this example showed their ability to think strategically as a team and make a strategic decision, when the majority of the team were of the same mindset. It is an indicator that the collective growth mindset that is required for SA can be enabled, even if a team member is not at the overall team level. Linking with the 'missed discussions' analysis, for this to occur the topic for discussion or decision making must not require the direct input of the function lacking the growth mindset, as is the case in this example.

Insight 7: Adding financial impact information can be a key enabler to engaging the team in SA discussions / decisions

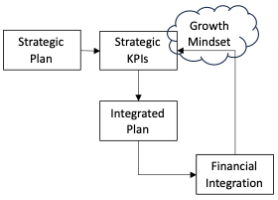
Business Perspective (What / Where / Who)	What was Observed			Evidence
Strategic Disciussion Integrated Reconciliation Review / Cycle 3 (Observation No.46)	There was a review of the capacity loading of ther key platform LYP over the longer term. When finance IRRCHA2 highlighted impact to VA and potentially CRI (Cost/unit) in 2024/2025 then it drove a strategic discussion about investigating whether can bring in some volume from external manufacturing.			LYP Capacity loading shown out through 2032 - only requirement is to level load 2024/2025. Challenge from IRRCHA2 to see if there are opportunities for more fills in 2025/2026 as capacity loading is down to 76% and 81% - "Otherwsie we will have an impact on VA - for example we should review contract timing with external supplier - may want to start planning to bring in some of that fill capacity in 2025/2026?" (Ref: 27 of 60).
Research Perspective (Why)	**Insight**	**CF Pattern Matching to the Review Meeting**		**Primary CF Relationships Engaged**
Strategic Disciussion Integrated Reconciliation Review / Cycle 3 (Observation No.46)	7. Adding financial impact information can be a key enabler to engaging the team in SA discussions / decisions	Contingency Variables	Scope / Strategic Plan / Horizon / Maturity - **Match.** Education - **Partial Match.** Overall team educated and understanding of full ambition for IBP. Some functions (eg:- Quality) require further education which is planned.	
		Response Variables	Product Portfolio / Strategic KPIs / Financial Integration / Scenarios - **Match.** Integrated Planning - **Partial Match.** Due to the challenges being experienced with the Quality projections the overall integrated plan cannot be assured until such time as this is resolved, despite all other functions being fully integrated into the plan.	
		Growth Mindset	Quality Function - **No Match** Rest of team - **Match** Growth mindset of the team evident in the discussions and frustrations when come to the Quality data. Recognised by IBP Process Lead and structured education programme planned.	
		Feedback Loop	Feedback Loop - **Match.** Disciplined approach to self assessment scoring at the end of review meeting and reinforement of actions to be taken to continuously improve.	
		Performance Variable	Performance - **Match.** Strategic Discussion. The financial porjections perspective promted a strategic discussion to review the option of bringing in volume from external manufacturer in 2025 to avoid risk of a hit to competitive measure of Cost/Unit, where site competetes with pother sites in the 'BigPharma' network..	

Figure 6. 15: Effects Matrix for Insight 7: Adding financial impact information can be a key enabler to engaging the team in SA discussions / decisions

The financial impact associated with potential decisions was evident in the review meetings. In fact there was a financial representative present in every one of the monthly reviews. In this example, in one of the 3 observations associated with this insight (observation no. 46), the financial representative (IRR_CHA2) is also the Chair of the Integrated Reconciliation Review. A discussion occurred which related to level loading future requirements in one of the key manufacturing platforms (LYP) over the years 2024/2025. A challenge was posed by IRR_CHA2 as to the potential impact to VA (value add) which is a key element of the strategic competitive KPI of Cost/Unit. This drove a strategic discussion around volume that was currently contracted externally and whether they should engage with the supplier to start planning to bring some of that volume back in house over that longer timeframe.

From a conceptual framework perspective the Integrated Reconciliation Review (IRR) team collectively showed themselves to have a growth mindset with the RAG status of amber driven by the Quality function, who demonstrated on many occasions their need for further education. However, the quality discipline was not fundamental to the discussion in this example and so the strategic discussion was engaged by the team.

Insight 8: The decision lead-time to close gaps determines when SA decisions need to be made.

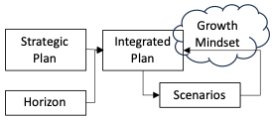
Business Perspective (What / Where / Who)	What was Observed		Evidence
Strategic Disciussion Supply Chain Review / Cycle 3 (Observation No.39)	Discussion on V&Os (Vulnerabilities & Opportunities) led to recognition that while potential issue, with regards to ambient warehouse storage caapcity, was outside the IBP horizon, the volumes in the Strat Plan are such that a decision would need to be made inside the IBP window. Actions taken to understand when decision would need to be made.		Potential problems on the horizon based on latest volumes in 2025/2026. Discussion driven by SUPCHA1 leveraging IBP language - "Decision will need to be made within the IBP horizon even if impact is outside the IBP horizon so needs to be brought forward to MBR and called out in V&O". (Ref: 8 of 64).
Research Perspective (Why)	**Insight**	**CF Pattern Matching to the Review Meeting**	**Primary CF Relationships Engaged**
Strategic Disciussion Supply Chain Review / Cycle 3 (Observation No.39)	8. The decision lead-time to close gaps determines when SA decisions need to be made.	Contingency Variables: Scope / Strategic Plan / Horizon - **Match.** Education / Maturity - **Partial Match.** Relatively new review versus other and observed some re-design activities still going on during the 3 cycles observed. All positive changes driven by an experienced team. Expect maturity to grow quickly and likely some education required to some functions to align with capability demonstrated by warehouse lead.	
		Response Variables: Product Portfolio / Strategic KPIs / Integarted Plan / Financial Integration / Scenarios - **Match.** All elements evident.	
		Growth Mindset: Full Team - **Match.** Srong capability evident from the collective team with clear "growth mindset" evident.	
		Feedback Loop: Feedback Loop - **Match.** Disciplined approach to self assessment scoring at the end of review meeting and reinforement of actions to be taken to continuously improve.	
		Performance Variable: Performance - **Match.** Strategic Discussion. Discussion on longer term volumes as outlines in the Strategic Plan through 2026/2027, highlihgted a decision likely to be made inside the IBP horizon re: Ambient storage capacity. Determining the timing of when decision needs to be made became the focus of the action taken.	

Figure 6. 16: Effects Matrix for Insight 8: The decision lead-time to close gaps determines when SA decisions need to be made

Two observations contributed to an insight that illustrated the importance of explicitly calling out the lead-time associated with closing gaps to the strategic plan. This determined when SA decisions should be made and shifted the teams attention to that timeframe. In the example from observation No.39 a SA discussion was trigged during the third cycle observing the Supply Chain review meeting. Longer-term volume plans had indicated there could be a need for extra warehouse capacity available in 2026 that would require a capital investment. The Chair (SUP_CHA1) of the review recognised that due to the lead-time involved to increase the physical warehouse footprint that a decision would need to be made within the IBP horizon. The action was taken to continue to monitor the volume plans and determine when a decision would need to be made to ensure sufficient time to create the extra warehouse capacity.

The pattern matching exercise for the supply chain review showed that most of the CF elements were in evidence for this review. It was a relatively new review versus the others, having been inserted to ensure attention was given to supply chain activities that were common to both of the APU (Autonomous Production Unit) manufacturing platforms. Therefore, there were some redesign activities addressed through the cycles and the team were still learning the best way to run the review meeting. This is why the contingency variable section was assigned a yellow RAG status in the effects matrix. The diagram is to

indicate that collectively there was a growth mindset evident and in this example it was the strategic plan over the long-term horizon that triggered the vulnerability and opportunity scenarios to ensure appropriate actions were taken to maintain a fully integrated plan for the future.

Insight 9: Visibility to the Strategic Plan is a key requirement for enabling SA.

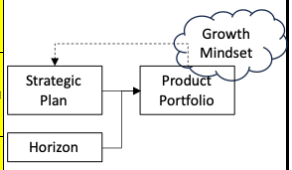
Business Perspective (What / Where / Who)	What was Observed			Evidence
Strategic Discussion mAbs Supply Review / Cycle 1 (Observation No.11)	The latest volumes indicated some big changes relative to the strategic plan in the longer term horizon, where key projects were justified. This triggered immediate concerns and associated discussion to drive clarification to avoid major impacts to project activity.			"Need to understand from GSC as to why - may be a mistake". "Would you be worried about that level of uncertainty for 2025" - MBOCHA1 - MBOFIN1 "It is a definite worry - volumes are going up and down" - "Impact to capital, project investments - need to highlight but have to use the numbers - everyone has to use the one set of numbers". "Hard to plan for because so much inconsistency in the cycles for the 2025 numbers". "What initiatives those swings could be impacting - need to understand and highlight"- MBOCHA1. (Ref: 26-27 of 56).
Research Perspective (Why)	**Insight**	**CF Pattern Matching to the Review Meeting**		**Primary CF Relationships Engaged**
Strategic Discussion mAbs Supply Review / Cycle 1 (Observation No.11)	9. Visibility to the Strategic Plan is a key requirement for enabling SA.	Contingency Variables	Scope / Strategic Plan / Horizon - **Match** Education / Maturity - **Partial Match** The Quality function have not been educated on the process and importance of SA. Impacting on the overall maturity of the IBP process step for engaging with longer term SA type discussions.	
		Response Variables	Product Portfolio / Strategic KPIs / Scenarios - **Match** Integrated Plan / Financial Integration - **Partial Match** The inability to align around the projections presented by the Quality function prevents a truly integrated plan being achieved. Financial Integration beyond the budget window is not an essential ingredient into the SA discussions.	
		Growth Mindset	Quality Function - **No Match** Rest of team - **Match** While overall the team appreciate the importance of longer term projections, discussions and decisions, the lack of trust in the Quality information impacts on the collective growth mindset to enable some SA discussions and potential decisions. However, on topics not directly realted to the Quality function SA discussions can still be seen to be enabled.	
		Feedback Loop	Feedback Loop - **Match** The self assessment conducted at the end of the review provides feedback on areas that require to be revisited and promted the team to put a focused education programme together for the Quality function.	
		Performance Variable	Performance - **Match.** Strategic Discussion. With the critical mass of the review team bought into the growth mindset, SA discussions can be enabled so long as they do not directly impact the function that is not in the same mindset as the rest.	

Figure 6. 17: Effects Matrix for Insight 9: Visibility to the Strategic Plan is a key requirement for enabling SA.

The importance of having visibility to the strategic plan as an enabler to 'SA in S&OP' was a contribution from the Delphi study with the field experts. Two observations captured in the case study also reinforced this. In this example from observation No.11, some significant changes to the strategic plan ('strat plan') in terms of volume reductions, triggered a strategic discussion as to the affordability of the portfolio of strategic projects under those circumstances. The observation was from the first cycle of the MBO supply review, where the Chair (MBO_CHA1) raised concerns about the instability of the volume plans beyond the year 2025. The finance representative (MBO_FIN1), who was also involved in the process for generating the updated 'strat plan', agreed but emphasised that the IBP principle of *"one set of numbers"* had to be kept in mind and so actions should be triggered according to the latest 'strat plan' volumes. This drove a discussion to look at the priorities across the strategic

projects in preparation for potentially having to make some decisions about which ones to stop.

The pattern matching to the conceptual framework elements reflected a strong match with the exception of the impact caused by the quality function (QAL*) who demonstrated that a targeted education intervention was required to support building their maturity to engage the process. Separately, financial integration within the supply reviews was primarily aligned to the current budget year. In practical terms for the supply review this was not such a big impact to SA. The primary expectation was to ensure the capacity positioning in line with the latest ‘strat plan’ volumes.

The diagram shows the primary elements of the CF that were engaged though this example. The collective growth mindset was still required to ensure that portfolio adjustments could be made to ensure alignment with the latest strategic plan, over the full IBP planning horizon.

Insight 10: Gap closing versus strategic plan is driven "bottom-up" first and only when exhausted all options then "top-down"

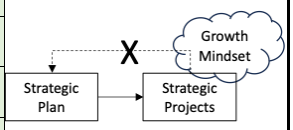
Business Perspective (What / Where / Who)	What was Observed			Evidence
Strategic Discussion Projects Review / Cycle 1 (Observation No.8)	Delay to project presented but not accepted yet to require a change relative to Strat Plan - push back by PRJCHA1 to revisit to see if actions can be driven "bottom up" to resolve first. Project suggested to be pushed to the backend on 2024 for completion.			"Can't just accept a delay without testing if delay can be mitigated" - PRJCHA1 . (Ref: 8 of 45).
Research Perspective (Why)	**Insight**	**CF Pattern Matching to the Review Meeting**		**Primary CF Relationships Engaged**
Strategic Discussion Projects Review / Cycle 1 (Observation No.8)	10. Gap closing versus strategic plan is driven "bottom-up" first and only when exhausted all options then "top down"	Contingency Variables	Scope / Education / Strategic Plan / Horizon / Maturity - **Match**. All elements evident.	
		Response Variables	Product Portfolio / Strategic KPIs / Integarted Plan / Financial Integration / Scenarios - **Match.** All elements evident.	
		Growth Mindset	Full Team - **Match.** Srong caapbility evident from the collective team with clear "growth mindset" evident.	
		Feedback Loop	Feedback Loop - **Match.** Disciplined approach to self assessment scoring at the end of each review meeting and reinforement of actions to be taken to continuously improve.	
		Performance Variable	Performance - **Match.** Strategic Discussion conducted. Discussion among team that sufficient investigation had not been conducted to see if potential delay could be avoided or mitigated and so delayed decision on whether to adjust the roadmap or not.	

Figure 6. 18: Effects Matrix for Insight 10: Gap closing versus strategic plan is driven "bottom-up" first and only when exhausted all options then "top-down"

Observing outcomes of discussions when a SA gap has been identified exemplified a focus on challenging all possible avenues to adjust the IBP plan to come in line with the strategic plan. Only when this was not possible (“bottom-up”) did the discussion shift to having to adjust the strategic plan (“top-down”).

In the example presented from observation No.8 a potential slippage to a strategic project was presented into the Strategic Projects review. The discussion that ensued resulted in a view

that all actions had not yet been exhausted "bottom-up" and so the suggestion that the strategic plan should be adjusted was rejected. From a pattern matching perspective the Strategic Projects Review provided sufficient evidence to be assigned a green RAG status across all of the conceptual framework elements. This was reflected in the collective team response in this example where the team were not ready to accept a suggestion of adjusting the strategic plan and worked on further actions to bring the projections back on track. This demonstrated an understanding of the priority of the "top-down" strategic plan relative to the "bottom-up" IBP plan.

Insight 11: Feedback loop on process performance enables building higher levels of capability

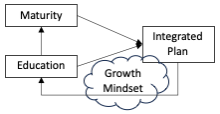
Business Perspective (What / Where / Who)	What was Observed			Evidence
Strategic Disciussion Product Review / Cycle 3 (Observation No.35)	The self assessment step promted a team discussion when a challenge was raised by IBPLED2 on scoring against demonstrated performance. Caused the team to reflect and confirm they needed to be more diligent on ensuring future plans reflected trends in performance. Education opportunity for the team.			Self assessment conducted at the end. Demonstrated a strong team view with many scores at maximum 4.0. Good challenge from IBPLED2 on 'planning based on demo perf' as to whether known H/C freeze is factored into future plans? Team responded through a number of participants and there was agreement to review program plans again under this constraint consideration.
Research Perspective (Why)	**Insight**	**CF Pattern Matching to the Review Meeting**		**Primary CF Relationships Engaged**
Strategic Disciussion Product Review / Cycle 3 (Observation No.35)	11. Feedback loop on process performance enables building higher levels of capability	Contingency Variables	Scope / Education / Strategic Plan / Horizon / Maturity - **Match.** All elements evident.	
		Response Variables	Product Portfolio / Strategic KPIs / Integarted Plan / Financial Integration / Scenarios - **Match.** All elements evident.	
		Growth Mindset	Full Team - **Match.** Srong capability evident from the collective team with clear "growth mindset" evident.	
		Feedback Loop	Feedback Loop - **Match.** Disciplined approach to self assessment scoring at the end of review meeting and reinforement of actions to be taken to continuously improve. Specific discussion on future plans and whether they reflected latest strategic H/C freeze constraint.	
		Performance Variable	Performance - **Match.** Strategic Discussion. Feedback through self-assessment triggered a reflection on projected plans and whether they truly were reflective of latest constraints that would be in place for the forseable future.	

Figure 6. 19: Effects Matrix for Insight 11: Feedback loop on process performance enables building higher levels of capability

A significant contribution from the case study analysis was the understanding of how the organisation went about building the growth mindset capability. This is covered in detail in section 6.4.4. One of the key mechanisms for testing whether the IBP processes were sufficiently mature to deliver the behaviours and mindset required was through the self-assessment mechanism in place at the end of each of the review meetings. One of the most significant areas which was revisited, when issues were identified, was education. In the example from observation No.35 from Product Review cycle 3, real time education was evidenced when the team collectively responded to a scoring challenge from one of the IBP leaders who was present (IBP_LED2). The challenge related to whether the team were effectively leveraging the IBP principle of *"planning based on demonstrated performance"*

(see IBP principles in Table 6.1, section 6.1), in terms of factoring the fact that the corporation had mandated a headcount freeze for the foreseeable future. After discussion the team agreed on the need to be more conscious of this principle to ensure the future plans were realistic and that no potential gaps were hidden. They adjusted the score and more importantly took action to review all program plans to see what impact there could be assuming no further headcount added.

The pattern matching for the Product Review reflected the evidence showing all elements of the conceptual framework present, which ultimately was reflected by the proactive and non-defensive discussions when the challenge was raised by the IBP leader. This is shown in the accompanying diagram where the growth mindset supported the feedback loop discussions.

With the Research Propositions (RPs) guiding the pattern matching observations, Table 6.2 provides a summary of how the insights related to the RPs.

Table 6. 2:Alignment of Insights with CF3 Research Propositions

No.	Proposition	Insights
RP1	The implementation of the defined set of contingency variables have a direct influence on the enabling role of the set of response variables in achieving 'SA in S&OP'.	No.9-Visibility to the strategic plan is a key requirement for enabling SA.
RP2	The capability of the response variable processes, to achieve 'SA in S&OP', is achieved through maintaining a closed loop feedback to the contingency variables, to ensure a fit is maintained between the contingency and response variables.	No.2-Reviewing performance relative to strategic KPIs can trigger SA discussions/decisions. No.3-Scenarios and assumptions are a key enabler to SA discussions/decisions No.7-Adding financial impact information can be a key enabler to engaging the team in SA discussions/decisions No.8. The decision lead-time to close gaps determines when SA decisions need to be made. No.11-Feedback loop on process performance enables building higher levels of capability.
RP3	The capability of the response variable processes, in achieving 'SA in S&OP' is demonstrated by a growth mindset in the organisation directly involved in the S&OP process.	No.1-Lack of trust in the data or presenter will inhibit SA discussions. No.6-A team that buys into the core principles of IBP will enable SA discussions/decisions
RP5	The positioning of the S&OP process in the planning hierarchy with two-way linkages to the strategic and operational planning levels is an	No.4-Product/Project roadmap changes can trigger SA discussions No.5-Product/Project roadmap changes can

	enabler to achieving 'SA in S&OP'.	trigger a realignment with the strategic plan No.10-Gap closing versus strategic plan is driven "bottom-up" first and only when exhausted all options, then "top-down"

As can be seen in Table 6.2 a number of the insights directly supported the RPs, reinforcing CF3. Others provided a deeper understanding into the constructs of CF3 that required further analysis. These are explored in section 6.4.2.

6.2.2 Integrated Business Planning (IBP) Reviews RAG (Red Amber Green) Perspective

As described earlier, based on a pre-determined set of guidelines (see earlier section 3.3.3), a core aspect of the pattern-matching exercise was to determine what evidence could be observed to support the presence or absence of each of the key elements of the conceptual framework (CF3). The guidelines concentrated the researcher's attention onto each element of the conceptual framework and enabled a RAG (Red / Amber / Green) status assigned based on:

- Red – Little or no evidence of CF element
- Amber – Some evidence of CF element
- Green – Strong evidence of CF element

By observing over 3 cycles for each review the context of the discussions and an appreciation of the team dynamics became clear. This drove an evolution of the RAG status with the final perspective only concluded after the third cycle was complete. A summary of the RAG status conclusion for each of the reviews, relative to the CF elements is shown in Figure 6.20.

CF Structure	Conceptual Framework Element	Product	Projects	Supply Chain	Demand	SP Ops	MB Ops	IRR	MBR
Contingency Variables	Scope								
	Education								
	Strategic Plan								
	Horizon								
	Maturity								
Response Variables	Product Portfolio Management								
	Strategic KPIs								
	Integrated Business Plan								
	Financial Integration								
	Scenario Planning								
Growth Mindset	Growth Mindset								
Feedback Loop	Feedback Loop								
Performance Variable	Strategic Decision Making								
Planning Hierarchy Poisitioning	Link to SM Review								
	Link to Ops Planning								

Figure 6. 20: RAG status of reviews with respect to CF elements

The detailed data capture files, showing all the evidence in support of the RAG status, were stored in the cases study database (illustrative example in appendix 6.3). A description of the analysis for each of the reviews that led to the final RAG status is described in Appendix 6.5.

The RAG status supported the Research Propositions (RPs) but went further in not just treating the presence or absence of a CF3 element, but allowing a perspective on the level of engagement / capability of the individual elements. As such the RAG status of the review meetings provided an important perspective when interpreting the findings. It enabled the researcher to reflect on the influencing factors when SA observations were made.

An analysis of the concluding RAG status for each review (Figure 6.20) showed that only the Product Review and the Projects Review had a "green" RAG status for all of the CF elements. Comparing this with the profile of where SA observations were made, indicates that the Product and Projects Reviews were a significant contributor to the data capture, as shown in Figure 6.21.

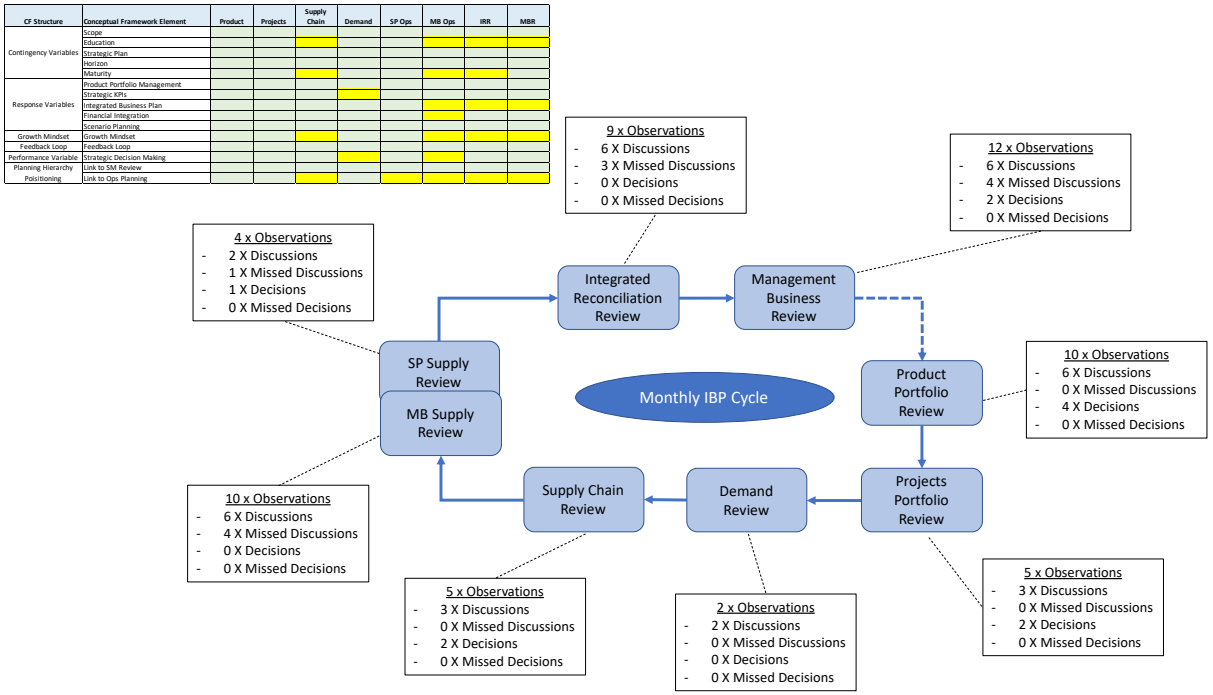


Figure 6. 21: Profile of where SA observations were made

Of the 57 SA observations, 15 (26%) came from the Product/Projects review. However, treating the Integrated Reconciliation (IR) and Management Business Review (MBR) as consolidation reviews fed by the others, it shows that 42% (15 of 36) of SA observations

came from the Product/Projects review. Removing "missed discussions/decisions" indicates that 48% (15 of 31) of SA observations related to SA discussions and decisions coming from the Product and Project Reviews.

These findings indicate that for 'SA' the Product and Projects Reviews have a more significant influence. In the context of *vertical alignment* to the strategic plan it is not surprising that these reviews would be very relevant as they focus on adjusting the future product portfolio and building the required capability to support future growth. The demand and supply reviews on the other hand would naturally focus more on the *horizontal alignment* of balancing demand and supply over the IBP horizon.

6.2.3 Interviews Conceptual Framework Implications

Through observing the review meetings over the three cycles a number of areas were identified that required further exploration to ensure the researcher had a complete appreciation for what was observed. These were explored through targeted semi-structured interviews.

The objective of the interviews was to further explore the findings arising from analysis of observed data related to the Research Propositions (RPs). However, attention was also given to potential emerging insights that could influence the structure or content of CF3.

The Thematic analysis (TA) approach, following Braun and Clarke (2006), was adopted to aggregate the data obtained from the interviews. Interpreting the findings provided a number of implications to the Conceptual framework (CF3). Through this process a number of key themes emerged. The themes (covered in section 6.3) were instructive on how to go about achieving 'SA in S&OP', while recognising some of the key challenges to be overcome.

Figure 6.22 shows the TA process that resulted in 13 implications to CF3 and 5 themes.

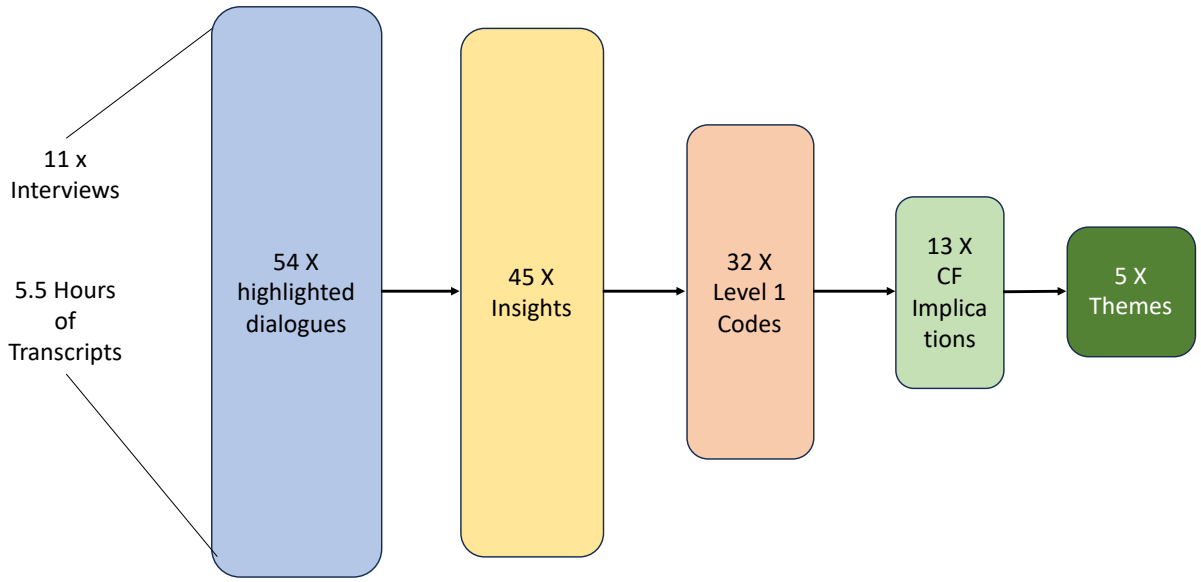


Figure 6. 22: Data Reduction Flow using TA from the Interview Data Capture

In the following sections each of the CF implications are described, including the supporting evidence. A diagram supports each finding showing the evidence, insights and coding (Figures 6.23-6.35). The emerging themes are presented in the following section (6.3).

CF Implication 1: Has to be a clear process for maintaining alignment between IBP and Strategic Plan

There were a number of insights provided through the interviews that explained the process involved in maintaining alignment between the IBP plan and the strategic plan.

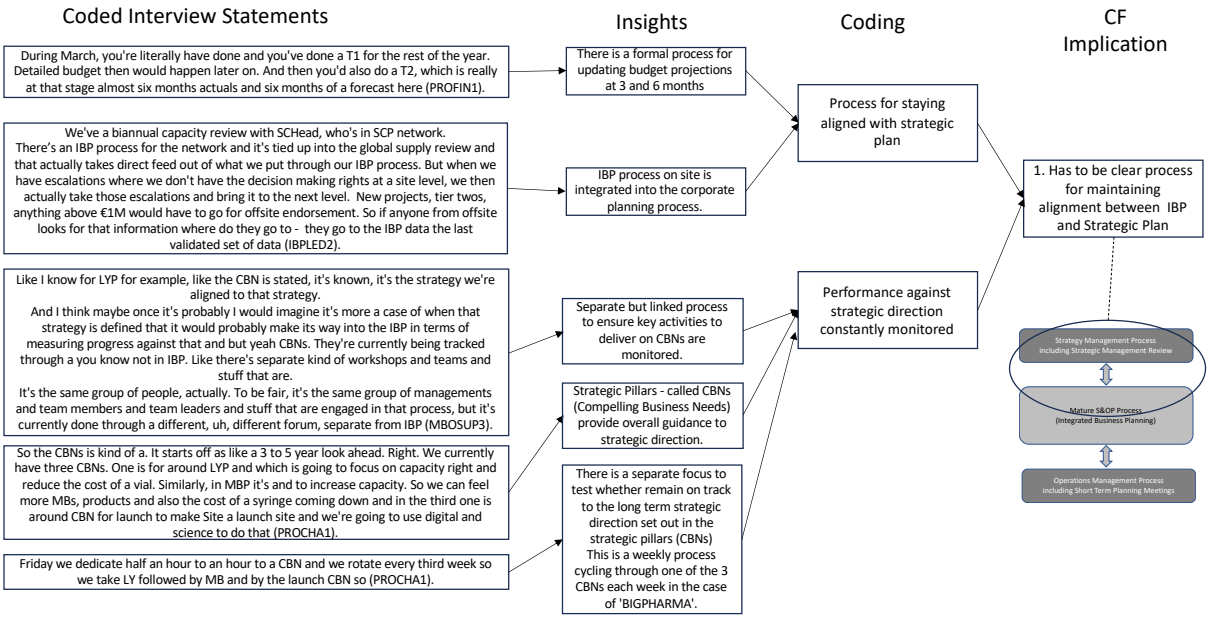


Figure 6. 23: Coding summary leading to CF Implication 1 - Has to be a clear process for maintaining alignment between IBP and Strategic Plan

It became clear that in terms of formally aligning to the "top-down" strategic plan ('strat plan') that there were a number of processes for doing this:

⇒ There were three formal updates to the budget that were primarily addressing the current fiscal year but also afforded the opportunity to provide updates to the longer-term strategic plan. Within a given year these occurred in March (T1) and in June (T2). The final update related to the creation of the budget for the following year in September (T3).

⇒ A separate process led by the senior leadership team involved reviewing the key projects aligned to each of the CBNs. Each Friday for 1 hour, one of the CBNs was on the agenda to review the status of the specific projects to ascertain whether the longer-term strategic direction was effectively supported. Each of these projects were also reviewed in the IBP Projects review but this separate meeting was considered part of the Strategy Management Process (SMP) with the "top-down" lens of the CBNs providing the framework.

⇒ The formal 'strat plan' is updated and reissued once a year in the April timeframe. At this point all agreed changes that had been approved throughout the year are

formally incorporated into an updated strategic plan over the following 5 year horizon.

The insights indicated that there was a process ongoing to provide feedback on misalignments between the latest IBP plan and the strategic plan. If agreed with corporate then adjustments to the strategic plan could be assumed and the new adjusted plan would in turn become the driver of the IBP plan.

CF Implication 2: Strategic Plan is a requirement for SA discussions / decisions

Through the interviews, insights were provided on the makeup and importance of the strategic plan for SA to be achieved.

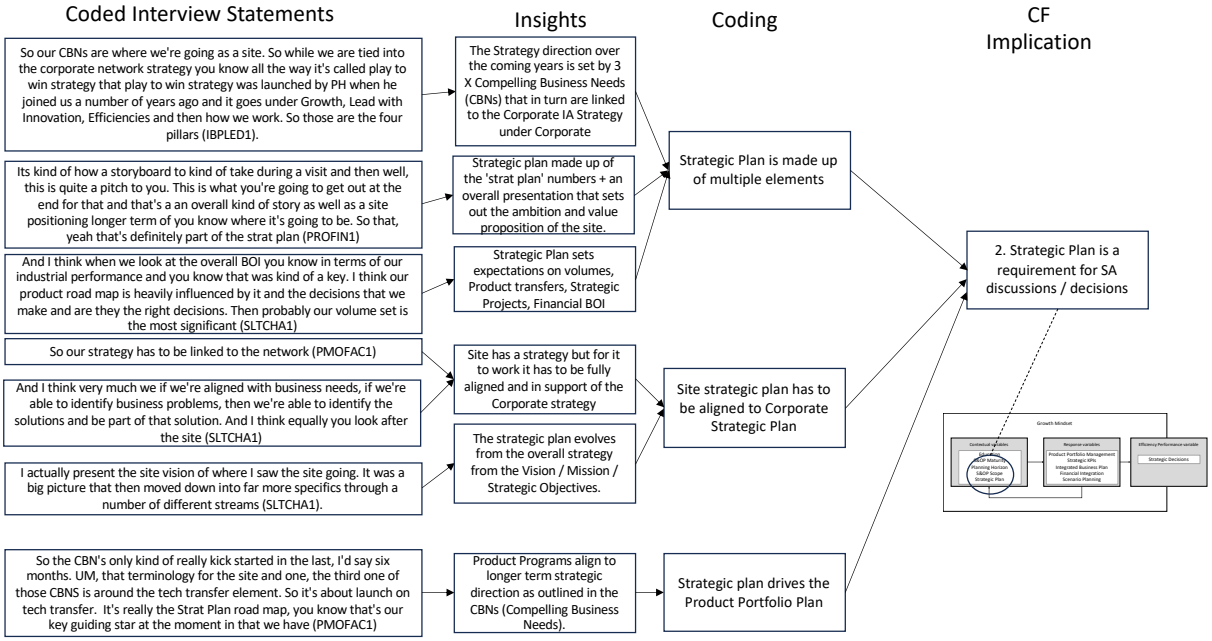


Figure 6. 24: Coding summary leading to CF Implication 2 - Strategic Plan is a requirement for SA discussions / decisions

The analysis provided a deeper appreciation for the importance of the 'Strategic Plan' contingency variable. Hence the supporting diagram is pointing towards the contingency variables of the CF3 framework.

The informants described how the strategic plan for 'BigPharma' is created through an annual process where a presentation is prepared and presented to corporate by the Site Leader of 'BigPharma'. The presentation sets out the ambition for the site over the next five years

making sure that proposals are fully aligned with the corporate strategy while leveraging the ongoing track record of the site as it continues to build its capability within the network. Once the high level direction is agreed then the detailed planning can occur that ultimately ends up with the 'strat plan' containing products, projects, volumes, financials, strategic KPIs mapped out over the next five years. This then provides the "top-down" direction for the site that the monthly "bottom-up" IBP process will be compared against triggering strategic decisions to close any projected mis-alignments. In delivering the future strategy for the site a core element of the 'strat plan' is the product portfolio roadmap, showing planned changes to the product portfolio going forward.

The insights provided reinforced the importance of the 'Strategic Plan' as a core requirement (contingency variable) to facilitate SA in the IBP process.

CF Implication 3: Strategic Plan changes can be triggered from Corporate or the Site

A number of insights pointed to the practical process involved in maintaining strategic alignment between the IBP plan and the strategic plan.

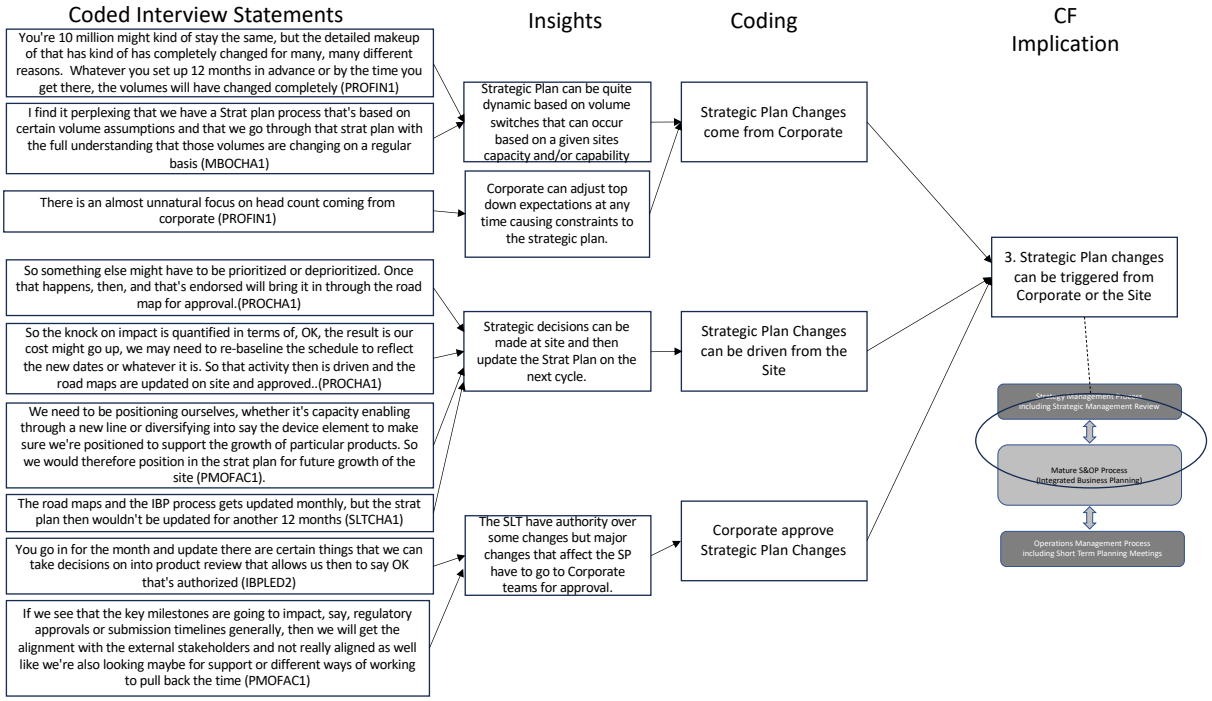


Figure 6. 25: Coding summary leading to CF Implication 3 - Strategic Plan changes can be triggered from Corporate or the Site

The analysis of these insights revealed how changes to the strategic plan come about at 'BigPharma'. Hence the supporting diagram highlights the link associated with the positioning of S&OP/IBP within the traditional planning hierarchy (Anthony, 1965).

What became clear is that aspects of the strategic plan can be dynamic, especially as it related to volumes and switches of volumes between manufacturing sites, to optimise supply. Also the strategic plan was not only a "top-down" process coming from corporate. The site had the authority to approve decisions that could trigger a realignment to the strategic plan. These in turn would be highlighted to the appropriate corporate strategic plan owners. Where authority was with the site to make strategic plan changes (e.g.:- responding to volume demands) then these would be captured by corporate and formally updated as part of the annual strategic plan update activities. If the proposed changes from the site required corporate approval (e.g.:- changes in timing of manufacture of product for clinical trials affecting regulatory approval timings) then they would be discussed with corporate and only with every option exhausted was it agreed to capture the change for updating of the strategic plan.

CF Implication 4: Projecting performance relative to Strategic KPIs can trigger SA

The informants highlighted the importance of projecting strategic KPIs when triggering SA leveraging the example of the Cost per Unit KPI.

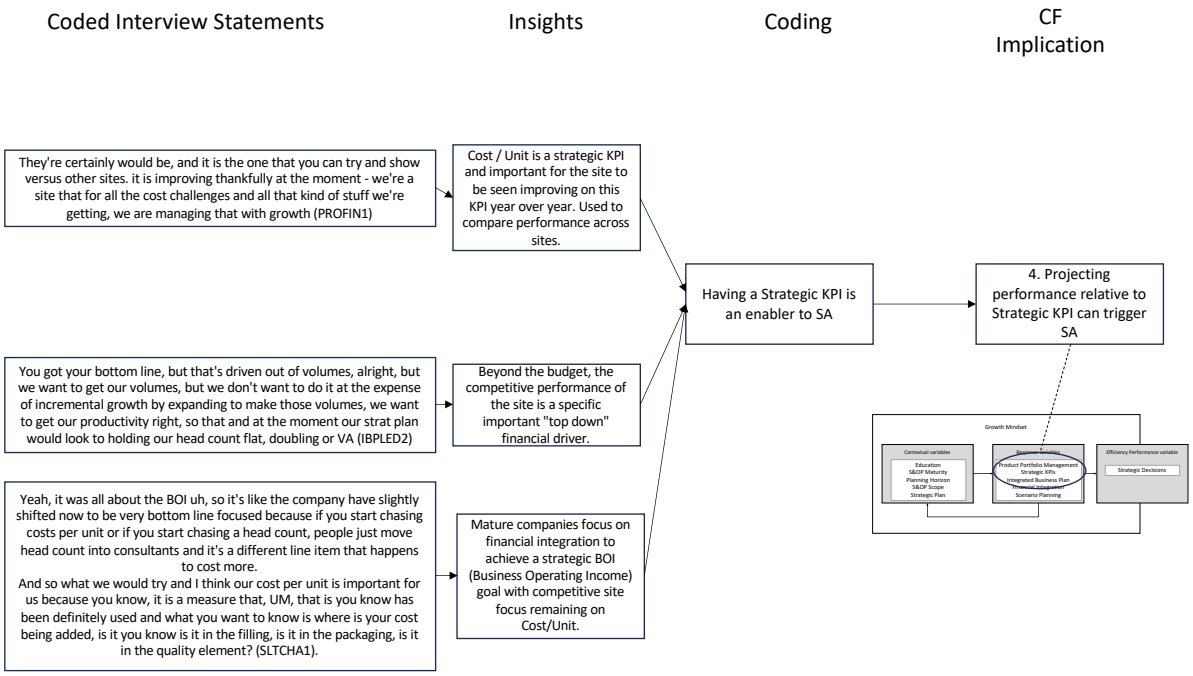


Figure 6. 26: Coding summary leading to CF Implication 4 - Projecting performance relative to Strategic KPIs can trigger SA

This CF Implication aligns with *Insight 2* arising from the 'SA in Action' analysis. The interviewee informants emphasised the importance of projecting performance against the strategic KPI of Cost per unit. Projections that were not aligned with the strategic commitment to corporate would trigger SA discussions. In particular there was an expectation that the competitive position of the site would improve year on year, demonstrated through an improving trend on the Cost/Unit KPI. This was considered important in strategically building the positive reputation of the site. In terms of the competitive landscape of being part of a large network of sites, the financial KPI of cost/unit was recognized as a key driver of actions and decisions. A related KPI of BOI (Business Operating Income) was in the process of being introduced at 'BigPharma', recognised as a complimentary strategic financial KPI.

CF Implication 5: Incentives drive behaviours

The informants highlighted a key challenge to the SA focus when the incentives are not aligned to drive the required behaviour.

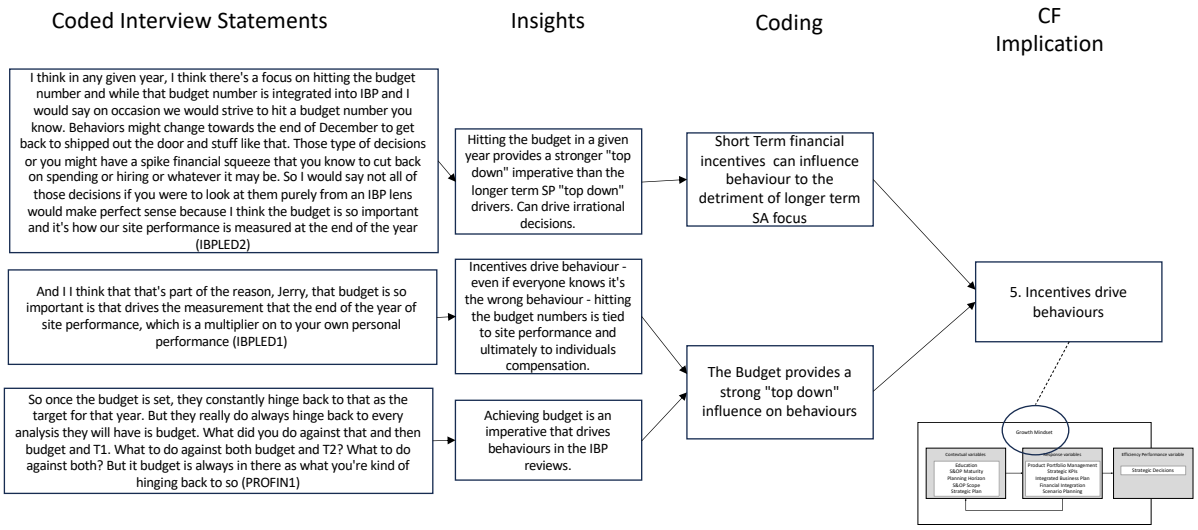


Figure 6. 27: Coding summary leading to CF Implication 5 - Incentives drive behaviours

Even though 'BigPharma' are acknowledged as mature in their IBP process, it was interesting to note that the tendency to focus on short-term priorities (as identified in the Delphi study) was still a feature of their operation. The informants highlighted that the imperative to deliver

against the current years budget commitment was very strong. So much so that it can cause irrational behaviours and decision making towards the end of the fiscal year, if budget targets are at risk. The example given by IBP_LED2 is that with the bonus incentives of the site tied to meeting the budget, there can be a drive to increase volumes beyond the demand plan and drive cost reductions in the short-term to hit the required targets, even if there are longer-term negative impacts. This strong emphasis on budget achievement is also emphasised by the financial representative PRO_FIN1. This shows that even when an organisation is conscious of the longer-term planning expectations and want to achieve SA, if the incentive programme is not aligned, it can negatively influence the better judgements of the collective team.

CF Implication 6: Projecting over a longer-term horizon enables proactive decision making

The interviews reinforced the importance of having a projected plan over a longer-term (3-36 months) horizon when triggering SA discussions.

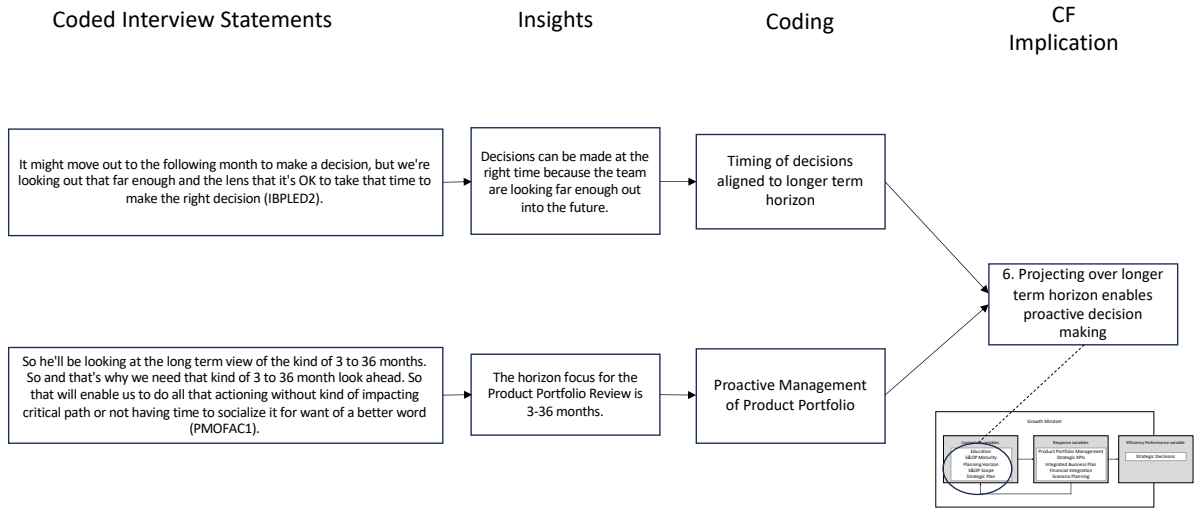


Figure 6. 28: Coding summary leading to CF Implication 6 - Projecting over a longer-term horizon enables proactive decision making

This CF Implication supported the importance of the conceptual framework contingency variable of the longer-term horizon. The informants stated that by looking out over the longer-term horizon it allowed them make proactive decisions to influence the future plans. In the interview with the product portfolio management review facilitator (PRO_FAC1) it was highlighted that the perspective over the longer-term horizon was key to address issues and avoid impacts to the *"critical path"* of the product related projects.

CF Implication 7: Feedback Loop is key to building SA capability

The informants provided valuable insights into how the iterative feedback process created a learning environment for the team to build required capability.

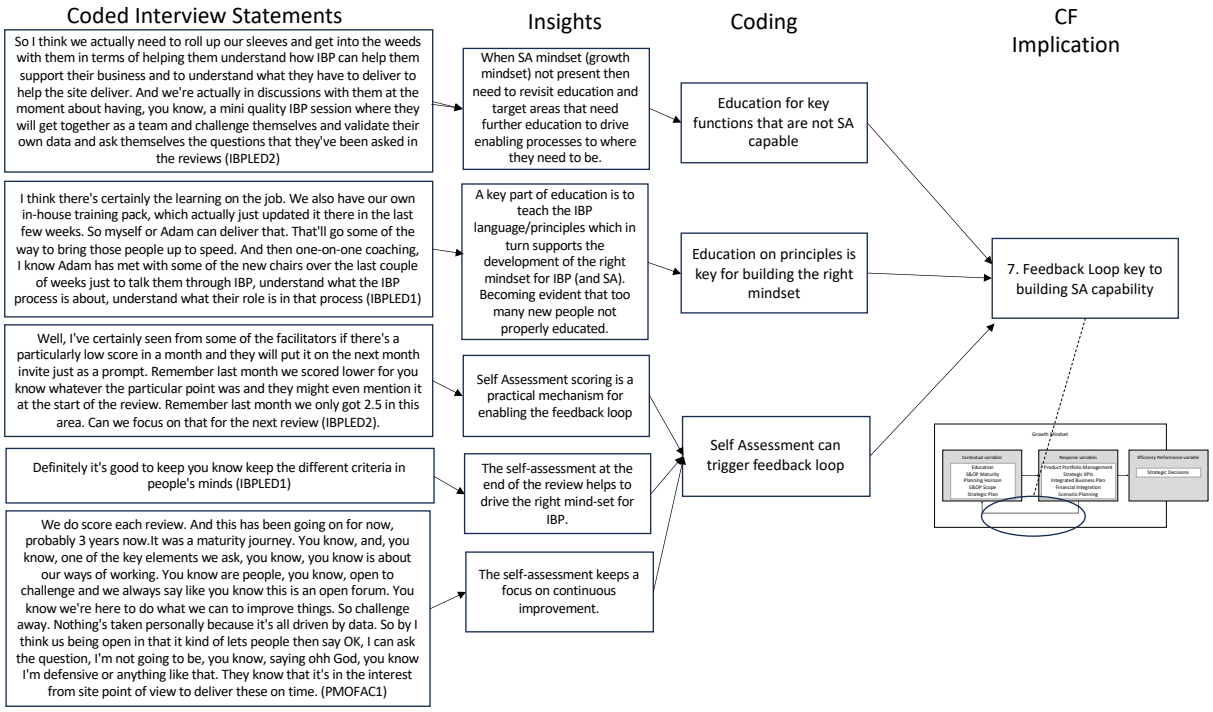


Figure 6. 29: Coding summary leading to CF Implication 7 - Feedback Loop is key to building SA capability

The inputs related to the self-assessment that was conducted at the end of each of the review meetings. The content of the self-assessment (copy of template displayed in section 6.1, Table 6.1) ensured ongoing awareness of the key principles that underpin the process. The informants highlighted that education was key when building the right mindset for SA. Within that it was not just about the mechanics of the process but also about the principles, which were key to driving maturity and building the collective growth mindset. By conducting the self-assessment it provided a database of information where, based on the trends, the IBP leaders could assess where foundational aspects needed to be revisited (contingent variables). It was considered that the process of conducting the self-assessment was part of the education process by keeping participants aware of the key principles: *"Definitely it's good to keep you know the different criteria in people's minds"* – IBP_LED1.

This CF Implication reinforced the importance of the feedback loop in CF3 but also indicated how critical the self-assessment aspect was in building the growth mindset required for SA.

CF Implication 8: Growth Mindset developed over time

Across a number of the interview insights it became clear that it takes time to develop the 'growth mindset'.

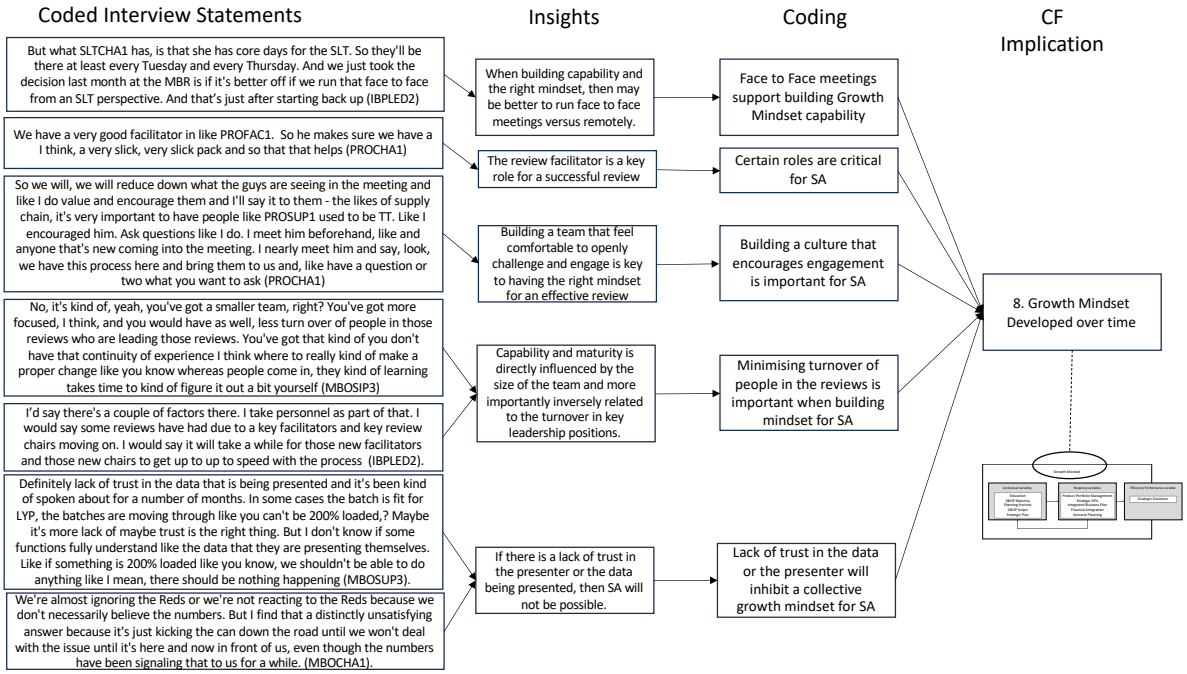


Figure 6. 30: Coding summary leading to CF Implication 8 - Growth Mindset developed over time

From observing the behaviours in the review meetings it was informative to see differences when SA was very much embraced (e.g.:- Product Review) versus where it was more difficult to achieve (e.g.:- MBO Review). Therefore, this was an area that was investigated in more depth during the interviews. Growth mindset emerged as a capability that takes time to develop and is impacted by turnover of staff, especially if in key leadership positions.

Following remote working, required during the covid pandemic, 'BigPharma' reverted to a hybrid work environment when global restrictions were lifted. This resulted in the IBP review meetings being conducted online. However, the senior leadership team was a newly formed team and therefore still developing. Therefore, the MD of the site insisted that the MBR be

conducted face to face. This was to help accelerate the building of the team capability and collective attention on the longer-term goals for the business.

It was observed and subsequently acknowledged in the interviews that in building a collective growth mindset some roles were more important that others in the review meetings. Of particular importance were the Chairs of the reviews and the Facilitators, to ensure the right topics received attention and the right behaviours were promoted in the review meetings. The size of the team was also considered a factor and also the amount of turnover of resources in the review meetings. The ultimate goal was to build a collective team who had enough trust in each other to openly challenge beyond their own function and actively engage in the discussions. Building such an engaging and empowering culture takes time and any lack of trust either of the data or individual presenters can have a negative impact on enabling SA.

CF Implication 9: Alignment across functions is a key value of IBP

The interviews highlighted that achieving *horizontal* alignment across functions was a core value of IBP, regardless of whether SA is being achieved.

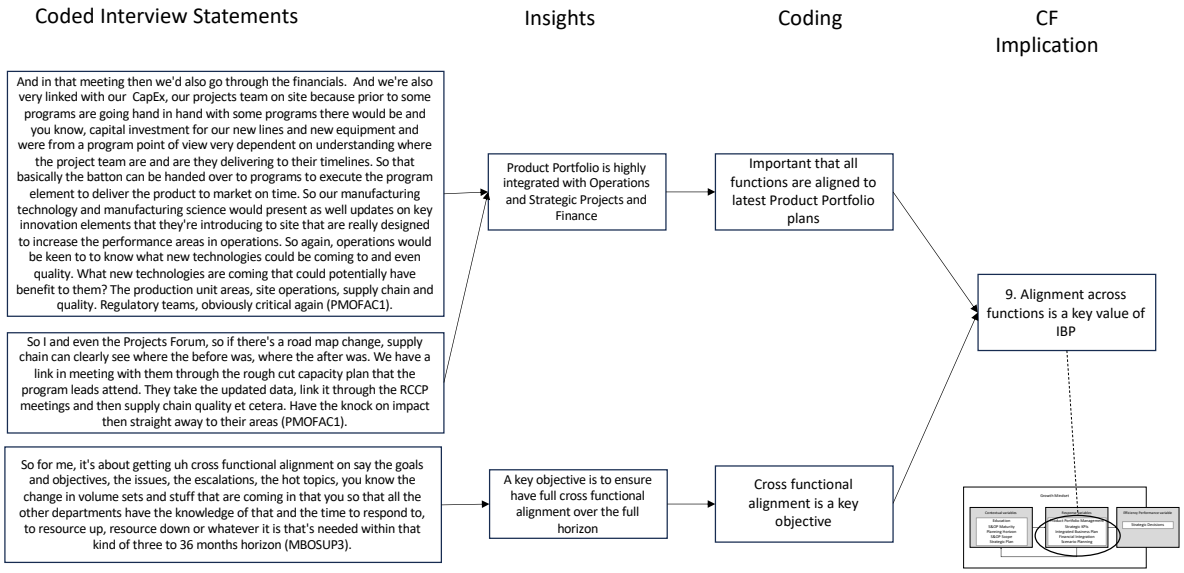


Figure 6. 31: Coding summary leading to CF Implication 9 - Alignment across functions is a key value of IBP

From observing the reviews it was evident that a key value to the organisation from conducting the review meetings was to ensure that all functions were aligned behind the integrated plan. In the context of SA this is referred to as *"horizontal alignment"* as defined

in Chapter 1. Investigating further in the interviews revealed the importance of cross functional alignment. An example is Product Portfolio Management, where any changes to plans affect all functions, making it essential to obtain cross functional alignment in the reviews.

CF Implication 10: Critical to have IBP process formally linked to short-term operations planning process.

The informants emphasised the importance of having the IBP process linked to the short-term operations process.

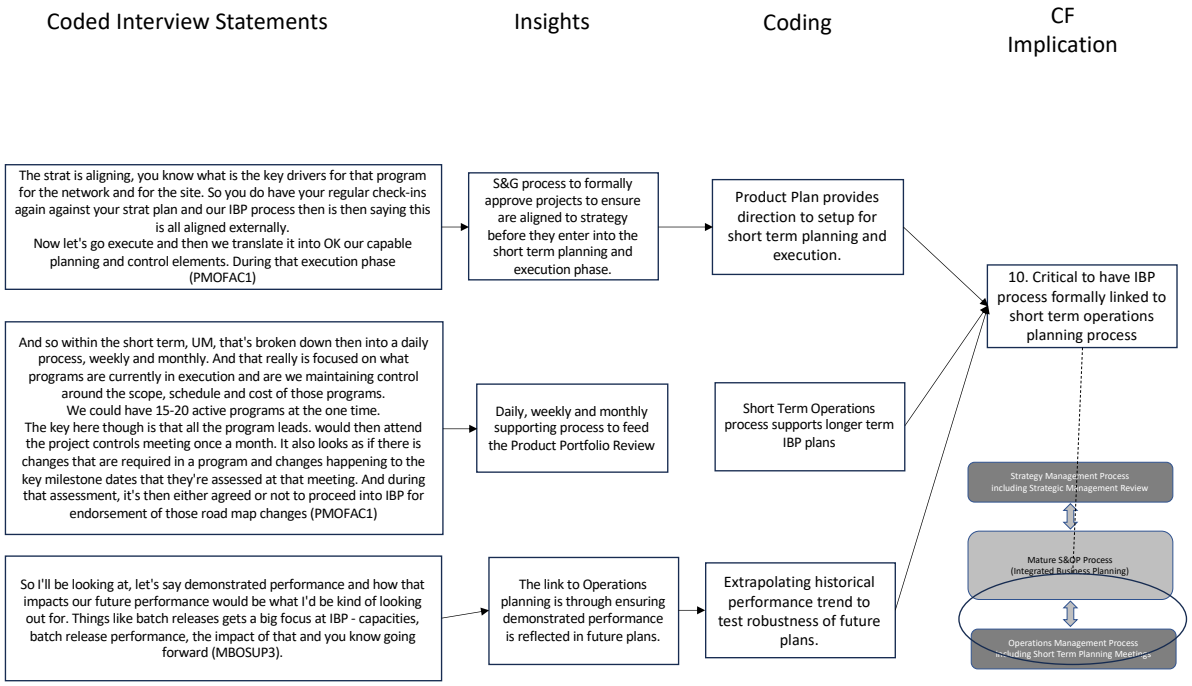


Figure 6. 32: Coding summary leading to CF Implication 10 - Critical to have IBP process formally linked to short-term operations planning process.

It had been established from the field research (Delphi Study) that the positioning of the S&OP/IBP process in the planning hierarchy was an important factor for SA. It was observed in the review meetings that a key mechanism for making the link to the short-term operations planning and execution involved the review of the historical KPI performance of the operations. Through the interview discussions, more clarity was brought to this topic. The interview with the Product Facilitator (PMO_FAC1) showed that the performance of the product plans were carefully monitored, in terms of meeting their milestones, before being

transferred over to the short-term operational planning horizon. From a manufacturing perspective it was clear that the IBP principle of "Planning based on demonstrated performance" required an appreciation of current performance and recent trends to determine how this should be factored into the future projections in IBP. This is an important consideration for SA because if the current performance is not factored in, projected gaps versus the strategic plan may not become visible to the process and SA discussion/decisions may not be triggered.

CF Implication 11: Financial Targets are a strong influence on SA

Through the interviews the informants stressed the importance of financial integration when engaging SA.

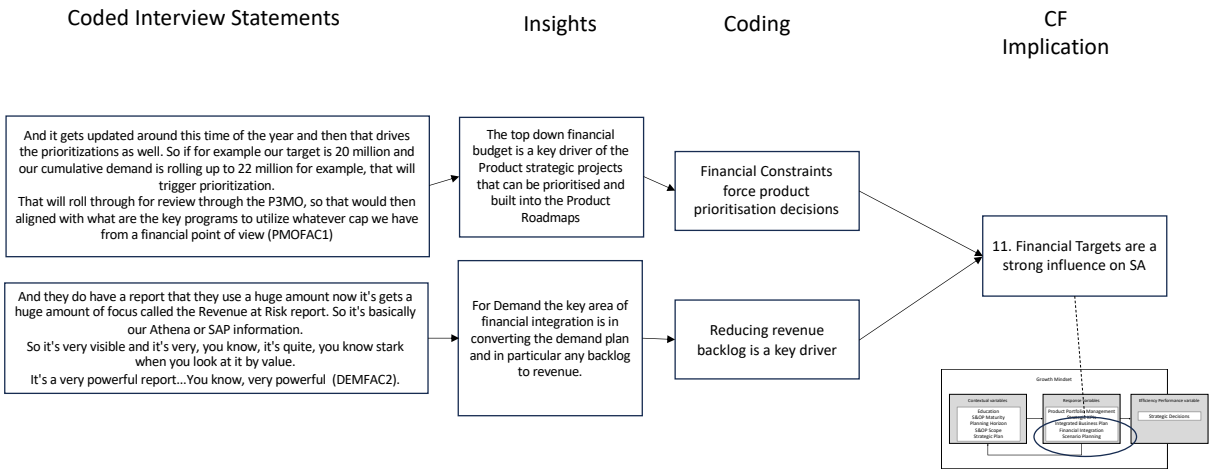


Figure 6. 33: Coding summary leading to CF Implication 11 - Financial Targets are a strong influence on SA activities

Financial integration took many forms from what was observed in the review meetings (see Insight 7 in section 6.2.1). One area highlighted from the interviews was the financial budget target for product portfolio management which put a constraint on the number of product related projects that could be supported. In terms of business performance and building a strong relationship with the commercial organization, maintaining a drive on minimizing the revenue backlog (i.e. the financial total of products that commercial could sell but are unable to due to lack of supply) was critical.

CF Implication 12: Reinforcement of value of CF elements in practice

Through the interviews support for the importance of a number of the CF elements was reinforced by the informants.

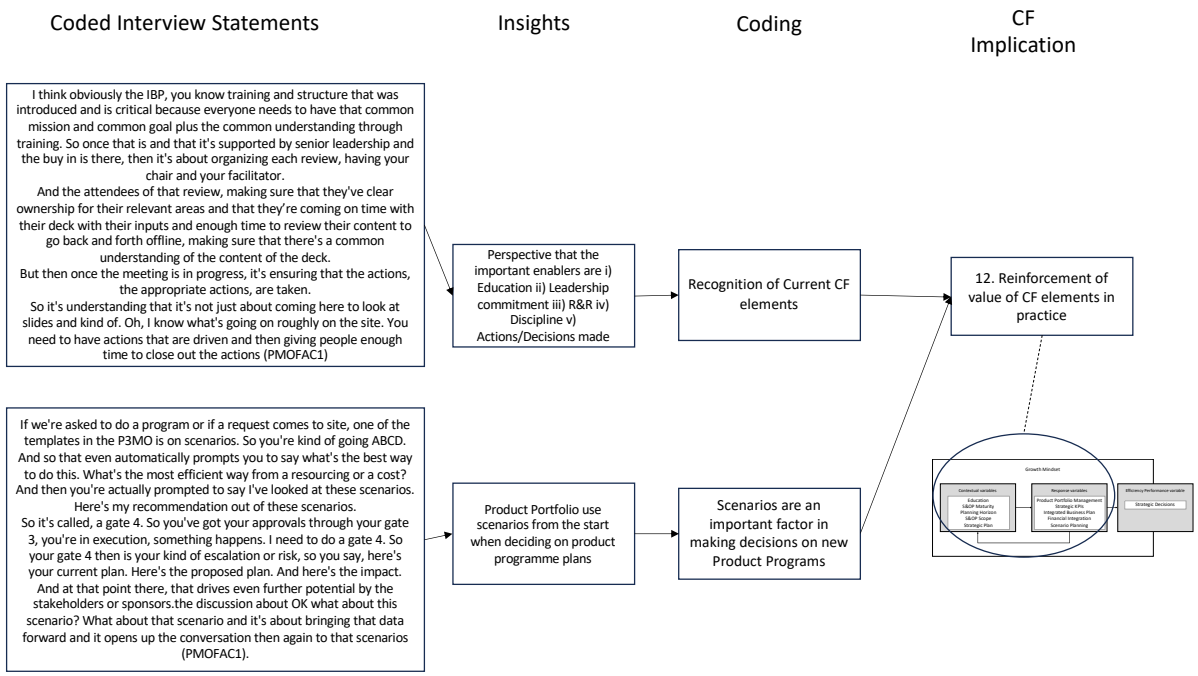


Figure 6. 34: Coding summary leading to CF Implication 12 - *Reinforcement of value of CF elements in practice*

The insights provided support many of the key elements of the conceptual framework when the informant was asked an open question as to what factors they believe support developing the mindset for SA in their IBP process. The input from the facilitator of the Product Review (PMO_FAC1), who is very experienced in the IBP process, aligned very well in particular with the key aspects that support the growth mindset in the conceptual framework – *leadership commitment, roles and responsibilities, discipline*. The emphasis on upfront *education* was also stressed as well as ultimately taking actions (*decision making*). The key role that scenario planning has in making strategic decisions on the product portfolio was also explained.

CF Implication 13: Designing templates to guide the data to be presented is an important enabling factor for SA

A number of insights pointed to the importance of having standard templates for representing data and preparing properly to ensure the right discussions are triggered in the reviews.

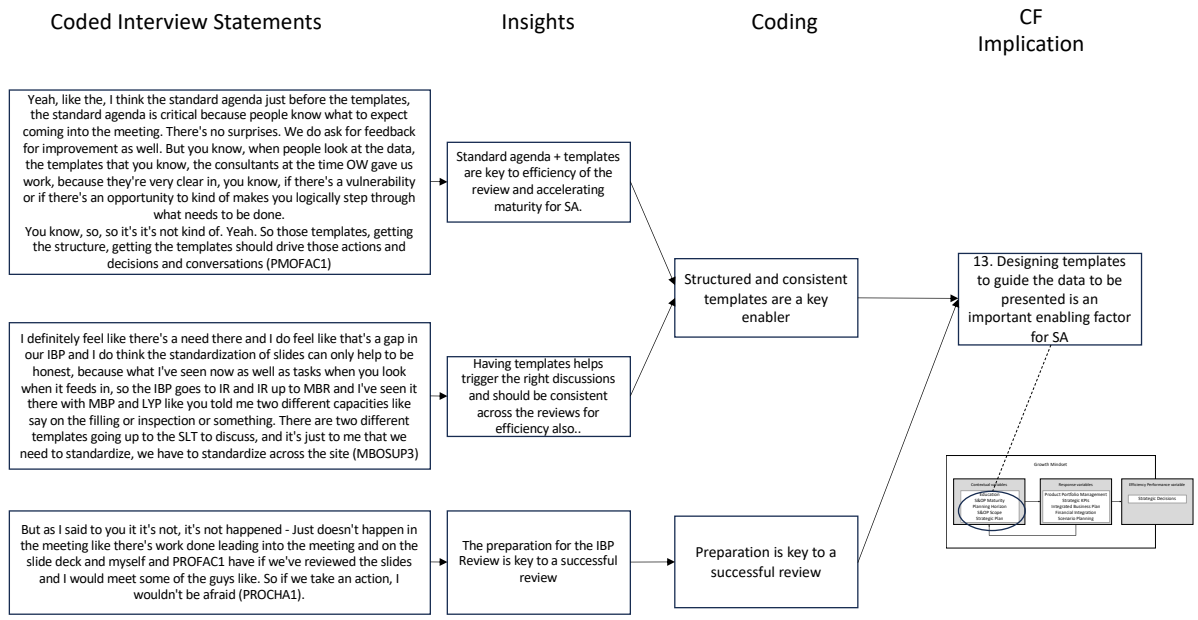


Figure 6. 35: Coding summary leading to CF Implication 13 - Designing templates to guide the data to be presented is an important enabling factor for SA

An emerging aspect from observing the review meetings was the importance of how the data was presented when it came to engaging SA discussions. This was investigated further in the interviews to gain a perspective from informants. The CF Implication that emerged indicated that a structured agenda, supported by templates for presenting different categories of information, was fundamental to the efficiency of the review meeting and also supported the triggering of the right discussions. This was an area that one of the supply chain representatives in the MBO platform supply review (MBO_SUP3) felt was really important but that as someone who attended a number of the review meetings, that there was opportunity for more consistency in approach across the reviews. The facilitator of the Product Review (PRO_FAC1) was clear that getting the templates right was key to enabling decision making: *"So those templates, getting the structure, getting the templates should drive those actions and decisions and conversations"*. Preparing these templates in advance and having them reviewed with the chair of the review was also emphasised by the Product Review Chair (PMO_CHA1).

Therefore, based on this analysis the templating of information became another key consideration when explaining the Scope contingent variable in the conceptual framework.

Guidance for the semi-structured interviews was provided by the Research Propositions (RPs). Table 6.3 provides a summary of where the 'CF Implications' aligned with the RPs.

Table 6. 3:Alignment of CF Implications with CF3 Research Propositions

No.	Proposition	CF Implications
RP1	The implementation of the defined set of contingency variables have a direct influence on the enabling role of the set of response variables in achieving 'SA in S&OP'.	No.2-Strategic Plan is a requirement for SA discussions / decisions. No.6- Projecting over longer-term horizon enables proactive decision making. No.13- Designing templates to guide the data to be presented is an important enabling factor for SA.
RP2	The capability of the response variable processes, to achieve 'SA in S&OP', is achieved through maintaining a closed loop feedback to the contingency variables, to ensure a fit is maintained between the contingency and response variables.	No.4-Projecting performance relative to Strategic KPI can trigger SA. No.7-Feedback Loop key to building SA capability No.11- Financial Targets are a strong influence on SA activities.
RP3	The capability of the response variable processes, in achieving 'SA in S&OP' is demonstrated by a growth mindset in the organisation directly involved in the S&OP process.	No.5-Incentives drive behaviours No.8-Growth Mindset Developed over time No.9-Alignment across functions is a key value of IBP No.12- Reinforcement of value of CF elements in practice.
RP5	The positioning of the S&OP process in the planning hierarchy with two-way linkages to the strategic and operational planning levels is an enabler to achieving 'SA in S&OP'.	No.1-Has to be a process for maintaining alignment between IBP and Strategic Plan No.3- Strategic Plan changes can be triggered from Corporate or the Site No.10- Critical to have IBP process formally linked to short-term operations planning process

The interpretation of these findings, including the emerging themes, are presented in the next section 6.3.

6.3 Interpreting the Findings

Significant data reduction was achieved through leveraging the structured methods of the effects matrices (Miles and Huberman, 1994) for analysing 'SA in Action' and thematic analysis methods (Braun and Clarke, 2006) for analysing the interviews. This in turn afforded the opportunity to take a deeper look at the findings and conclude on potential enhancements to the Conceptual Framework (CF3).

As per the *critical realism* philosophy (as described in Chapter 3), it was important for the researcher to look beyond the actual findings and investigate the causal mechanisms. Continuing with the Thematic Analysis (TA) outlined by Braun and Clarke (2006) for analysing the interviews, a number of themes emerged that in turn could be examined with support from the findings of pattern matching when observing 'SA in Action'. The latent themes, as listed, will be discussed in sequence in the following sections:

1. Growth Mindset takes time
2. Learning environment required
3. Trust is essential
4. Dynamic of 'top-down' versus 'bottom-up'
5. Short-term versus long-term tensions

6.3.1 Theme 1: Growth Mindset takes time to develop

A central theme emerging from the interviews findings is that the achievement of an organisation *'growth mindset'* takes time. The 'CF Implication No.8' specifically highlighted this with reference to a number of coded statements. The evidence would indicate that the IBP teams need to be developed and encouraged to openly challenge the review discussions. If there is a turnover of participants it can slow down this process. This is particularly true if the pivotal roles of the review Chair or Facilitator are rotated. The feedback received through 'CF Implication 9' would indicate that a key value of the IBP process is to achieve cross functional alignment. The evidence captured across all reviews would support cross functional alignment as a base expectation. This *"horizontal alignment"* as referenced in the literature (Kathuria et al., 2007) would need to be in place before the organisation can build a

higher order of capability to address the *"vertical alignment"* expectations of which SA is an essential part. Hence it takes time to develop the *'growth mindset'*.

6.3.2 Theme 2: Learning environment required

Linked to theme 1 it emerged that an environment needs to be created to support a learning organisation culture. As highlighted by 'CF Implication No.7', having a mechanism to trigger a feedback loop when the enabling processes are not delivering SA, provides the opportunity to revisit key contingent elements to determine what needs to be done (e.g.:- when further education was triggered for the QAL* organisation). The iterative process of feedback creates the learning environment that enables the organisation appreciate what is required to deliver SA. As became clear when analysing 'SA in Action' a key part of building the capability is through embracing the IBP principles (see 'SA in Action, Insight 6). The feedback loop is triggered by the self-assessment scoring that occurs at the end of each review meeting, which asks each team to score themselves on how well they embraced the IBP principles. This iterative loop creates the learning environment to build the capability over time (see 'SA in Action, Insight 11).

6.3.3 Theme 3: Trust is essential

The theme of 'trust' is very evident through the discourse captured from the interviews. When referring to the MBO Supply review, where 'missed SA discussions' were observed, a member of the supply chain team (MBO_SUP1) stated *"Definitely a lack of trust in the data that is being presented"* (coded statement from CF Implication No.8). The Product Review on the other hand demonstrated a high level of trust on the data presented and the team as a whole. It is instructive when the chair of the Product Review (PRO_CHA1) explains the importance of preparing in advance with his facilitator (*"…there's work done leading into the meeting… and with PRO_FAC1 we've reviewed the slides…so, if we take an action, I wouldn't be afraid"* – coded transcript from 'CF Implication No.13) and how it was important to encourage the team to engage (*"...I do value and encourage them...Ask questions like I do"* – coded transcript from 'CF Implication No.8). The underlying message is of building trust among the team, the results of which are evident with the SA discussions conducted in the Product Review. The analysis points to the need for trust within the team to trigger SA discussions/decisions. The impact of having trust versus not having trust (in either

the data or the presenter) was observed clearly when observing the live reviews, as reflected in 'SA in Action' – Insight 1.

6.3.4 Theme 4: Dynamic of 'top-down' versus 'bottom-up'

A key objective of the interviews was to investigate how the link between the IBP process and the strategic plan worked in practice. What emerged from the analysis is an important dynamic whereby when closing any identified gaps between the IBP plan and the strategic plan, every effort was made to address all actions to bring the IBP plan in line with the strategic plan ('bottom-up') and only when these actions were exhausted would the strategic plan be adjusted to align with the IBP plan. The examples provided from the informants coded in 'CF Implications 1 to 3' described the various processes for keeping the IBP plan on track to the strategic Plan (e.g.:- "*Friday we dedicate half an hour to a CBN"* – coded statement from PRO_CHA1 in 'CF Implication No.1). As described by the informants, strategic plan changes can come from corporate ('top-down') or suggested by the site ('bottom-up'). The priority of the strategic plan was emphasised when discussing the requirement to realign plans based on 'top-down' changes whereas 'bottom-up' changes would go to corporate as recommendations and plans would only be adjusted once approval is received. An example of this dynamic was evident in the 'SA in Action'- Insight 10, where it was challenged whether the actions to recover a delay to a project had been exhausted ('bottom-up') before any recommendations were made to adjust the strategic plan ('top-down'). For the 'BigPharma' entity they revisited their strategic plan formally once a quarter where the leadership team would discuss any potential changes that needed to be made locally based on the "bottom-up" experiences of the previous three months and recognising that the corporate 'Strat Plan' was only formally updated once a year. Having this Strategy Management Review (SMR) on a quarterly basis, attended by the leadership team, supported the findings from the Delphi study that concluded having a SMR, run quarterly, attended by the leadership team, would provide the required linkage between S&OP and the strategy of the business.

6.3.5 Theme 5: Short-term versus long-term tensions

The link between the IBP plan to the short-term planning and execution process was a topic discussed in the interviews. The challenge, that had been highlighted by the experts during the Delphi study, of the organisation being too focused on the short-term, came to the fore

also during the interviews. One of the key factors presented related to the focus on delivering the budget within a given fiscal year. Compounding the challenge was that the incentives were aligned to the short-term budget deliverables and not the long-term strategic goals (See 'CF Implication No.5). The resulting tension, while providing a challenge, did not prevent 'BigPharma' from engaging 'SA Discussions/Decisions' over the tactical planning horizon. However, they had to remain vigilant when reviewing short-term KPIs to ensure they were used to challenge future plans based on demonstrated performance and not allow the team to be dragged into short-term root cause analysis discussions. A simple example was observed when in the Supply Chain Review, the agenda sequence was reversed from cycle 1 to cycle 2 to move the short-term performance discussions to the back end of the review meeting.

The five themes supported a deeper understanding of two key aspects of the 'SA in S&OP' phenomenon: i) How to build the growth mindset and ii) How to integrate in the planning hierarchy. Figure 6.36 shows the alignment of the themes to these two topics:

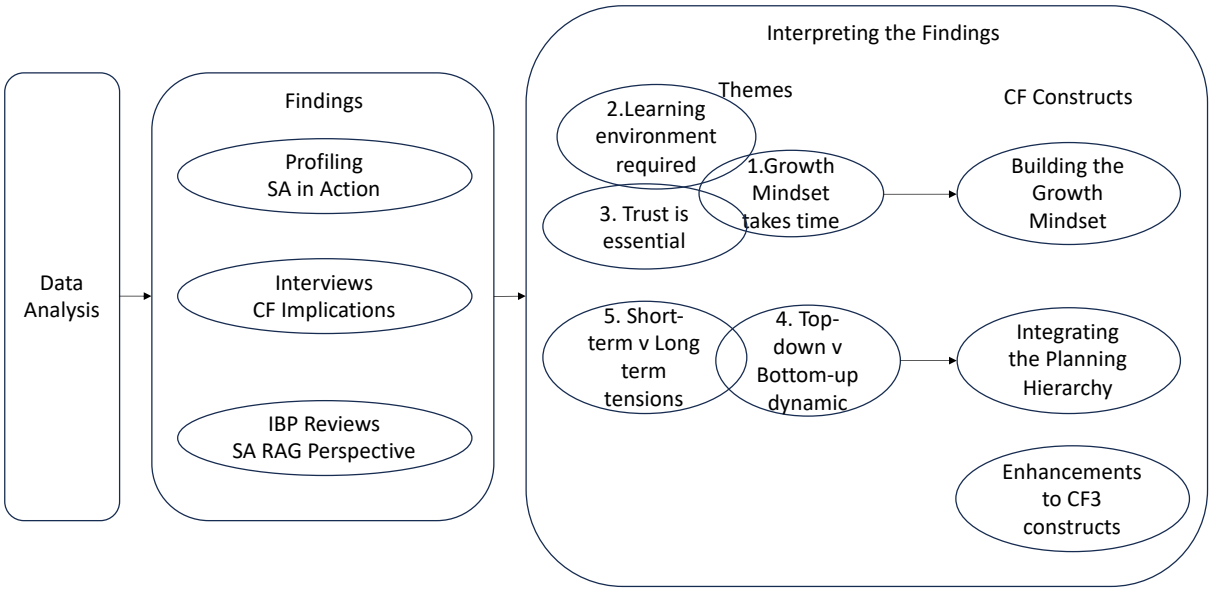


Figure 6. 36: Interpreting the Findings – Linking Themes to CF Constructs

Beyond the *'Growth Mindset'* and *'Planning Hierarchy'*, the interpretation of the findings also revealed some emergent considerations to CF3. Each of the areas of interpretation are covered in the subsequent three sections (6.3.6 – 6.3.8).

6.3.6 Building a Growth Mindset

A ‘growth mindset’ among the S&OP/IBP team had been established as a core part of the conceptual framework leading into the case study (CF3). Observing the live IBP review meetings at ‘BigPharma’ provided a first hand insight into what this means in practice. In particular by making a comparison between review meetings that demonstrated a strong capability for SA (e.g.:- Product Review) versus review meetings that struggled to achieve SA (e.g.:- MBO Supply Review), some key characteristics were identified to help understand this intangible capability.

A key characteristic supporting the growth mindset was evidenced by the collective trust across the team (Theme 3). From the first cycle, observing the Product review, an excerpt from the data capture file states:

“Team environment evidenced by ability to challenge each other, acknowledge when had mis-understanding and no hesitation in highlighting broader implications to risks and potential decisions.” (Researcher logs from Product Review Cycle 1, Data Capture File).

When compared to the first cycle observation of the MBO platform supply review meeting, there was a lack of trust evident as it related to the Quality function part of the team:

“Mindset of QAL not display sense of ownership - capacity charts red for the future and could only talk about headcount - no real scenarios or glide paths to resolution. Challenged well by IBP_LED1 and MBO_CHA1 (ref: 47-49 of 56).” (Researcher logs from MBO Supply Review Cycle 1, Data Capture File).

As identified earlier in ‘SA in Action’ (*Insight 1*) the collective trust of the MBO team was not achieved. As a result the growth mindset was not present when SA discussions / decisions were missed. However, an influencing factor observed related to the specific topic under discussion. The principal example from the case study was the lack of trust evidenced with the quality (QAL*) organisation. Therefore, any topics that came under their remit ended up constrained when it came to engaging SA discussions/decisions. However, other examples showed the collective growth mindset was sufficient to drive SA discussions, when the QAL* organisation were present, but the topic was not under their direct responsibility. An example from the MBO Supply Review from cycle 1 demonstrates this. The team were concerned with the volatility of volumes coming from the demand plan for fiscal year 2025. A discussion between the Chair of the review (MBO_CHA1) and the finance lead for the

review (MBO_FIN1) was quickly concluded by leveraging one of the IBP principles: *“"Would you be worried about that level of uncertainty for 2025?" – MBO_CHA1. "It is a definite worry - volumes are going up and down - Impact to capital, project investments - need to highlight but have to use the numbers - everyone has to use the one set of numbers"- MBO_FIN1* (Extract from MBO Supply Review from cycle 1). The IBP principle of *one set of numbers*, once referenced by MBO_FIN1 brought immediate clarity across the team. While actions were generated to verify the volumes, there was to be no second guessing and everyone agreed to plan based on the volumes as per the demand plan in the interim. There was no challenging from this point, including from MBO_CHA1 who had the ultimate accountability to ensure the supply plan matched the demand plan. The dynamic observed across the team was one of heads nodding indicating an appreciation of maintaining the discipline of the IBP principles.

From observing the language used in the review meetings it became clear that ‘BigPharma’ leveraged the IBP principles (Theme 2) as a means to build the right mindset over time. They were diligent in conducting self-assessments at the end of the reviews to assess how well they were doing. By creating a feedback loop, the learning environment was established (Theme 2). An anonymised copy of the self-assessment template (see Figure 6.37) shows the continuous attention on the key areas that ‘BigPharma’ considered critical to delivering a successful review meeting. Direct linkages can be made to a number of the elements within the conceptual framework.

BigPharma Self Assessment Element	Conceptual Framework Linkage
Facilitators & Key Input Owners Prepared for Review	Growth Mindset (Roles & Responsibilities)
Chair Attendance	Growth Mindset (R&R / Leadership Commitment)
All attendees Present, On Time, In Full	Growth Mindset (R&R / Leadership Commitment)
Integrated: Are we leaving aligned?	Response Variable: Integrated Planning
One set of numbers	Response Variable: Integrated Planning
Decision Making	Performance Variable: Decision Making
Planning based on demo' performance	Growth Mindset (Discipline / Trusted Team)
Appropriate time horizon (4-36 Months+) All Capacities Updated	Contextual Variable: Horizon
Plan to Win Behaviours: Take Action, Stretch, One Co., P&C	Growth Mindset (Discipline / Trust / Communications)
General: Truth as we know it, Roughly Right, Silence is approval, Good/Bad News Early	Growth Mindset (Discipline / Trust / Communications)
General: Did we use our time effectively	Contextual Variable: Maturity
Overall approach with self-assessment at end of each review	Feedback Loop

Figure 6. 37: ‘BigPharma’ self-assessment template with linkages to CF3

The process of conducting these self-assessments demonstrated that ‘BigPharma’ recognised the need to constantly provide feedback on the effectiveness of the review meetings and capturing areas that needed revisiting in support of building the growth mindset capability. In

particular the self-assessment topics were weighted strongly towards encouraging the required behaviours. Thus the self-assessments afforded the opportunity to continually remind participants in the review meetings of how they needed to behave to deliver value. This was designed to build the growth mindset capability over time (*Theme 1*) to where SA was fully engaged, moving beyond the foundational value of achieving cross functional alignment *(CF Implication 9)*. The recognition that the required mindset takes time to develop through continual iterations of testing and revisiting foundational areas (contingency variables) indicates the investment and discipline required to build such a capability. This could also point to why so many organisations struggle to achieve SA in their S&OP/IBP processes, as discussed earlier (Chapter 2).

To develop the growth mindset there were a number of areas that had been identified as part of the research leading to the case study. These came into sharp focus when observing the review meetings in practice. The elements along with examples of supporting observations are listed in Table 6.4. Quotes are from the researcher logs in the various data capture files.

Table 6. 4: Elements supporting Growth Mindset

Growth Mindset Element	Data Capture Observation	Reference
Roles & Responsibilities	*"Everyone appears to understand their role - maybe more cycles to develop total cross functional role perspective also?"*	Projects Review – Cycle 3
Discipline	*"Collective mindset of the team to want to be in control and proactively manage the business so discipline is important on the things they have identified through the self-assessment checklist."*	Product Review – Cycle 2
Leadership Commitment	*"Strong leadership with active involvement and challenging by the SPOCHA2 ."*	Steriles Supply Review – Cycle 2
Communications	*"Charts focused on key information to be communicated and enabled cross functional team to confirm alignment to latest information."*	Demand Review – Cycle 3
Trust / Lack of Trust	*"Trust across the team evident with the exception of QAL - lack of trust evident from challenges that came in from many functions - MBO_CHA1, MBOSUP3, MBOMFG1, IBP_LED2, MBOMFG2"*	MBO Supply Review – Cycle 2

Therefore, on deeper analysis, the development of the intangible capability that promotes the right behaviours, underpinned by the IBP principles, occurs over time and after continual iterations of feedback through the IBP cycles. The behaviours developed complement the key elements identified in CF3, that make up the achievement of a growth mindset.

The learnings from the detailed analysis related to achieving a "growth mindset", supported the research proposition (RP3), while providing a much richer understanding of the capability and how to achieve it. As addressed later in section 6.4, the new insights obtained from the case study drove a change in structure to CF3 as it relates to how the intangible growth mindset capability is represented.

6.3.7 Integrating the Planning Hierarchy

The literature review and Delphi study highlighted the importance of maintaining a linkage between the S&OP/IBP process to the Strategic Planning process and the Operations Planning and Execution process. This positioned S&OP/IBP in the tactical planning arena when aligned with the planning hierarchy put forward by Anthony (1965).

The case study provided a perspective on how these linkages are maintained in practice as it relates to engaging SA. Throughout the data capture and subsequent analysis, the terms "top-down" and "bottom-up" as introduced in Chapter 1, were used to help when describing the dynamics involved.

Analysis of the evidence highlighted that misalignment between the IBP process and the strategic plan can be caused by "top-down" changes from Corporate or "bottom-up" changes based on the latest IBP plan. However the dynamic involved in striving to achieve realignment is different in each situation (Theme 4). What is evident is that the "top-down" driven changes drive a non-negotiable response to realign the plans at the site. During the case study this was evident in the example of discussions when considering the impact of an indirect headcount freeze – *"There is an almost unnatural focus on head count coming from corporate"* – PRO_FIN1 / "With headcount freeze, we will need to assess the impact to future programmes" – IRR_PMO1. The response to the "top-down" direction showed that actions were triggered to come in line with the new direction even though it was likely to impact on some key programmes that were underway. That is not to say that strategic plan changes could not be influenced by the site (bottom-up). There were many examples

observed where changes to the IBP plan were discussed leading to expectations that the strategic plan ('strat plan') would need changing. However the difference was that the "bottom-up" changes went to corporate as requests and only if approved could the plans be adjusted – *"If we see the key milestones are going to impact, say, regulatory approvals or submission timelines generally, then we will get the alignment with the external stakeholders"* – PMO_FAC1.

This dynamic of "top-down" and "bottom-up" driven re-alignment of plans is ongoing during the fiscal year with the strategic plan formally updated once a year. The awareness of the organisation to maintain the alignment was evidenced through the 'SA Discussions' observed in the review meetings.

The ongoing quest for strategic alignment requires a process to create the linkage with the strategic plan. This process was described by the respondents during the interviews *(CF Implication 1).* There was a corporate cadence in place for formal "bottom-up" updates from the site throughout a given year after 3, 6 and 9 months. While the focus was very much on the current budget year, requested updates to the longer-term strategic plan were also considered. In addition, coming from the monthly IBP review meetings, monthly corporate meetings were held to feed into the corporate planning cycle. This was particularly important for Product and Project plans that were oriented towards building a future capability in line with the strategic plan expectations *(Insights 4 & 5)*.

To stay aligned with the strategic plan and direction of the business, a separate but linked governance process at 'BigPharma' involved a weekly meeting where each of the Compelling Business Needs (CBNs) were reviewed for progress. The link to IBP was made through the strategic projects whose progress was tracked in line with the CBNs.

The identification of the various processes for linking with the strategic plan provided evidence that IBP cannot indeed operate in isolation and needs to be formally linked with the strategic plan. The case study evidence showed how this was accomplished at a practical level for 'BigPharma'.

One area 'BigPharma' had not addressed related to aligning incentives towards a longer-term focus. In fact it was acknowledged that the incentive system was very much focused on delivering the annual budget and there were times where this caused short-term decisions, even if the decision had negative longer-term implications (Theme 5). This is an area that would help when orienting the organisation towards the longer-term horizon, as

acknowledged in the interview with IBP_LED2: *"…the question is if that was gone and you were measured more long-term, would you be more focused on long-term performance? And the answer is absolutely yes".* While this is an area identified by 'BigPharma' for improvement, it did not prevent the development of the collective mindset to anticipate potential issues over the longer-term horizon for discussion and/or decision making. However, in the context of the planning hierarchy, it was also evident that it was important to maintain a linkage between IBP and the short-term (typically 0-3 months) operations planning and execution horizon (Theme 5). One aspect is to ensure that the IBP plan becomes the plan of record for execution in the operations planning horizon ("top-down"). This aspect was described for product portfolio management by PMO_FAC1 – *"So you have your regular check-ins against your 'strat plan' and our IBP process. Then it is saying this is all aligned externally. Now let's go execute and then we translate it into our capable planning and control elements, during the execution phase"*. More importantly as it relates to SA the performance to plan when executed is used to challenge the longer-term plans in IBP ("bottom-up"): *"So I'll be looking at, let's say demonstrated performance and how that impacts our future performance"* – MBO_SUP3. This showed a desire by 'BigPharma' to ensure that the future plans were as realistic as possible by challenging them based on current performance. It shows that the linkage to the operations planning and execution horizon is also an important aspect for SA.

With the insights gained as to how the linkages are made between S&OP/IBP and the processes of strategic management and operations management, the conceptual framework CF3 was adjusted to integrate in the linkages into one combined model as shown in section 6.4.

6.3.8 Emerging Conceptual Framework Insights

As highlighted by Ridder (2017), even when starting with a set of RQs and RPs tied to a CF, the researcher still has to maintain an open mind to potentially emerging elements that could enhance the structure or content of the conceptual framework. In this case study there were a number of emerging aspects that triggered a structural change to the CF.

- Moderating Factors – Section 6.3.8.1
- Strategic Projects Management – Section 6.3.8.2
- Scope Contingency Variable – Section 6.3.8.3

6.3.8.1 Moderating Factors

Two elements that were positioned as response variables in CF3 leading into the case study were 'Financial Integration' and 'Scenario Planning'. While there was considerable evidence across the review meetings observed of the presence of these elements *(Insight 3 & Insight 7)*, what could be seen is that there were instances when SA discussions were conducted in the reviews even though the financial aspects may not have been considered and scenarios around the future projections were not presented. However, when it came to strategic decision making, both of these elements were always present and they were certainly helpful in a number of the SA discussions. As an example scenarios were presented when making decisions about adding products to the existing product portfolio at the site – *"If we're asked to do a program or if a request comes to the site, one of the templates in the P3MO is on scenarios. What's the most efficient way from a resourcing or a cost?"* – PMO_FAC1 *(CF Implication 12)*. Therefore, what emerged is that 'financial integration' and 'scenario planning' were performing a more moderating role in achieving SA as opposed to a direct enabling role (Baron and Kenny, 1986). Certainly their presence were instrumental to efficient decision making (see MBR example from cycle 3 in Table 6.5). However, their absence did not prevent SA discussions. Reflecting on the previous input from the Delphi panel of experts, when expressing that 'financial integration' was fundamental, it was also in the context of 'strategic decision making'.

Examples from the data capture that was analysed are shown in Table 6.5.

Table 6. 5: Examples of the moderating role of 'Financial Integration' and 'Scenario Planning'

Example from Data Capture	Reference	Commentary
'strat plan' 2025-2029 presented on key projects: "Expect that any final alignment actions with corporate will be complete this month - challenges still outstanding on Opex" - PRJCHA1. Some projects have	Projects Review – Cycle 2. Strategic Discussion	Strategic discussion observed related to the strategic plan direction and matching strategic projects. While financial constraints were mentioned (*Opex*), there was no financial data presented and no scenarios. No decisions made but a proactive and

been removed where there was viewed that there was not a strategic driver for them (37 of 48). Discussion on projects and how strategic they will be and have to prioritise projects to deliver on CBN direction.		strategic discussion ensued across the functions present to discuss which projects had the highest priority as it related to strategic plan alignment.
3 X Scenarios presented for capacity projection crunch on PFS Inspection. Recommendation on scenario 3 accepted (37 - 38 of 61). Financials of impact over time presented for each scenario which appeared to be a vital aspect, linking back to discussions in IRR when preparing the scenarios. "Still on track to fully automate process for 2025 with corresponding reduction in 30 H/C?" - SLTCHA1 - Agreed. "Decision we have made to add 4 X people to inspection is fine but we need to still meet 'strat plan' expectations on headcount overall" - SLTCHA1.	Management Business Review (MBR) – Cycle 3. Strategic Decision	In this example 3 X scenarios were presented to address a capacity gap into the future. Financial implications of each scenario were presented and a strategic decision was made to add headcount. The inclusion of scenarios with financial implications was a supporting factor to making the decision at the senior leadership team level, in an efficient manner.

Recognising the role of 'financial integration' and scenario planning' as moderating factors resulted in a structural change to CF3, as shown in section (6.4).

The framework, CF3 coming into the case study also had 'assumptions management' and 'lead-time of decisions' as part of the 'scenario planning' response variable. From the case study evidence, the importance of assumptions was evident across all review meetings when discussing longer-term potential issues. This can be seen in the data capture files where

assumptions were presented into each of the review meetings. Therefore, this was retained in the revised model as an important response variable when enabling SA.

For decision lead-time *(Insight 8)* the evidence indicated that this was helpful in deciding when decisions were required, but was not essential and therefore was also more of a moderating factor. Therefore, this remained as a sub-element of scenario planning in the revised model.

6.3.8.2 Strategic Projects Management

As described earlier the case study business ('BigPharma') designed their IBP process flow such that they had a dedicated step in the process for managing strategic projects. This was a recognition by them of the importance of the broad range of projects required to deliver an increased capability in support of the future strategic direction of the site. By the nature of this review the projects that were discussed had a longer-term focus and so in a similar fashion to the Product Portfolio Review, it was naturally biased towards engaging SA type discussions. A summary of where strategic discussions/decisions were observed showed ten coming from the Product Reviews and five from the Projects Reviews (see earlier Figure 6.21).

In addition the types of discussions / decisions engaged in these reviews were very much concentrated on trying to close any potential gaps between the strategic plan and the IBP projections *(Insights 4 & 5)*. That is to say they were associated with *vertical alignment* using the terminology from the literature (Kathuria et al., 2007). While other reviews showed SA discussions/decisions made were primarily associated with the *horizontal alignment* activity of balancing demand and supply over the longer-term horizon (e.g.:- Capacity balancing discussions in SPO and MBO supply reviews).

Based on this analysis it was concluded that an adjustment was appropriate to the conceptual framework, CF3. While the framework had strategic projects identified as a contingency variable as part of defining the 'Scope', it was determined that the ongoing process of managing the portfolio of strategic projects should be positioned as a response variable, directly enabling SA, in a similar manner to Product Portfolio Management. Therefore, this was positioned as such into the updated framework as shown in section 6.4.

6.3.8.3 'Scope' Contingency Variable

From observing the review meetings it became clear that the way data was presented was an important factor in how the subsequent discussions progressed in the reviews. While there were some issues being worked on with respect to consistency across the review meetings, templates were in place to ensure the right data was made available to trigger the required discussions – *"Getting the templates should drive those actions and decisions and conversations"* – PMO_FAC1 *(CF Implication 13)*.

It was interesting when observing the review meetings to find the majority of the review meetings were conducted within an hour with the longest scenario of 1.5 hours, for the less mature reviews. A key enabler to the efficient facilitation of the review meetings were the use of consistent templates in the specific reviews. From the evidence gathered the team rarely had to question the structure of the slides presented. The discussions immediately targeted the information on display and the implications from the data drove the discussions.

This insight prompted an extra element added to the "Scope' contingency variable as part of the updates to CF3, to highlight the importance of building data presentation templates to support the SA processes.

6.4 Conceptual Framework Evolution

The detailed analysis of the case study data influenced an update to the conceptual framework from CF3 to CF4 (as shown in Figure 6.38). In this section the updated framework is described.

The in-depth case study proved an instrumental component of the research project through observing an exemplar S&OP (IBP) process and organisation, and matching observations relative to the CF3 conceptual framework. The evidence primarily confirmed the efficacy of the framework but also influenced some changes in structure and content, providing more vivid descriptions of key constructs. The theoretical underpinnings provided by Contingency Theory, Resource Based View (RBV) and Dynamic Capabilities (DCV) proved to be very valuable in providing understanding and perspective to the case study findings. In particular, a better understanding of what it takes to build a collective team "growth mindset" emerged and the DCV lens brought attention to the capabilities of the organisation to achieve SA.

From a practitioner perspective, it provides a guideline framework for how to go about achieving 'SA in S&OP', something that organisations have struggled with over the years (Alexander, 2013, Turner, 2018).

6.4.1 Conceptual Framework Structure

The conceptual framework combined updates to the core framework as well as consolidating the planning hierarchical perspective into one integrated diagram (CF4) as shown in Figure 6.38.

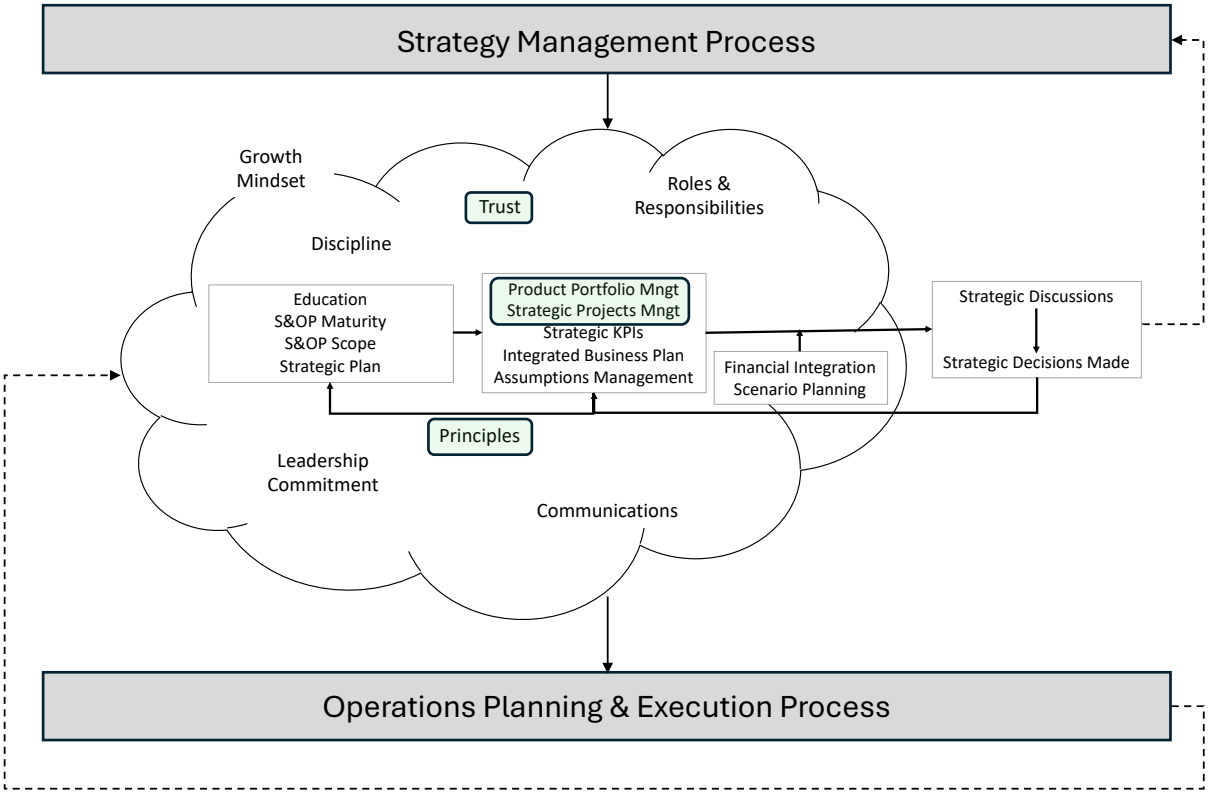


Figure 6. 38: Final consolidated conceptual framework (CF4)

As shown in Figure 6.38 the case study findings supported the overall structure of CF3 explored through the Research Propositions in terms of requiring a set of contingency variables influencing a set of response variables to deliver the performance variables (RP1). However changes did emerge as to the make-up of what were considered response variables and from the evidence observed, shifting a couple of response variables to be moderating factors. These specific changes are discussed later in this section.

The findings from the case study showed that every element of the conceptual framework and the associated relationships had an influence on enabling 'SA in S&OP'. As such the framework reflected why so many organisations have struggled to achieve 'SA in S&OP', in what is clearly a complex phenomenon. However, as it relates to building the *growth mindset* the evidence from the case study indicated that certain aspects were more influential than others. Therefore the elements of building 'Trust' (Insight No.1) and leveraging the S&OP/IBP 'Principles' (Insight No.6) were highlighted with the green colour to show this. Also, as it relates to 'SA in S&OP' it was shown that not all reviews have equal importance (see section 6.2.2 RAG perspective of reviews) with the 'Product Portfolio' and 'Strategic Projects' reviews having more significant relevance. Hence they were also highlighted in the final CF4 framework.

The feedback loop from the response to the contingency variables ensures a fit is maintained (RP2) and through the iterative cycles the capability for SA is demonstrated through a growth mindset (RP3). The feedback loop can be triggered by a recognition that the response processes are not capable of delivering SA, recognition that expected SA discussions and decisions are not being made, or the behaviours in terms of demonstrating the S&OP/IBP principles is not being demonstrated in the review meetings. The achievement of SA is demonstrated through strategic discussions that can in turn lead to strategic decision making (RP4). Finally the positioning of the S&OP/IBP process maintaining linkages to the strategic and operations planning processes is an enabler to SA (RP5).

However the practical insights from the case study research brought forward a more detailed explanation of the conceptual framework, suggesting some changes to the structure and the way it is depicted.

With respect to building the 'growth mindset' for SA, the evidence from the case study crystallised the intangible aspects of building this capability over time. This is represented as a cloud-like structure to reflect this intangible capability aspect. In addition, some of the most important characteristics of the organisation that underpin the growth mindset were positioned in the cloud, including the IBP 'principles'. Reflecting on the feedback from the interviews, 'incentives' were not included in the 'growth mindset' cloud, recognising that while beneficial to encourage alignment to longer-term thinking, the case study business achieved strategic alignment despite not having aligned incentives. Therefore, it was parked as a topic and positioned as part of future research to consider its moderating effects (see Chapter 7, section 7.4). The boundary of the cloud was moved such that the impact of SA in

triggering SA discussions and SA decisions were positioned outside the cloud. This is in acknowledgement that the achievement of SA is demonstrated through the growth mindset, which enables SA discussions as a minimum. The arrow from SA discussions to SA decisions indicates that to make a SA decision, there first has to be a SA discussion.

The structural change to move 'financial integration' and 'scenario planning' from response variables to moderating variables, is reflective of the evidence in the case study where SA discussions and decisions were made without these elements present. However, what was evident is that when these elements were included they were a positive support to achieving SA discussions and decisions. While 'scenario planning' is positioned as a moderating factor, a new construct, 'assumptions management', is identified as a response variable, supported by the evidence where assumptions formed a central part of every longer-term discussion in the reviews observed.

The capability lens provided by RBV theory on the response variables was evidenced very strongly by the self-assessment that each team conducted at the end of the review meetings. By following the trends and challenges encountered, the IBP Process Leads would revisit the contingency variables to determine what needed to be done to regain a fit. As observed this could be a targeted education session with a targeted group and/or a revisit of the scope to ensure an optimised design was in place. The continuous iterations facilitated by the feedback loop was instrumental in building the higher order capabilities leading to the growth mindset. As shown with the Quality organisation in particular, without this higher order capability SA discussions and decisions were not enabled.

6.4.2 Conceptual Framework Elements & Relationships

Some changes were made to the elements within the framework to better reflect the practice observed in the case study. The key updates to the content are highlighted in yellow in Figure 6.39.

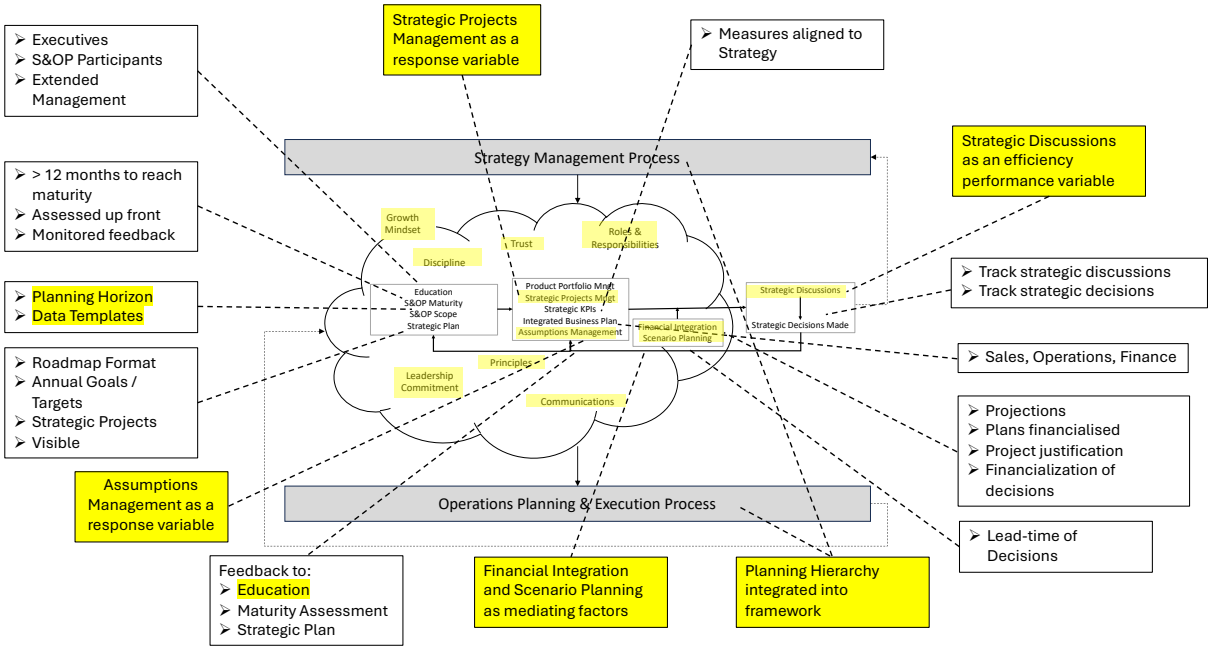


Figure 6. 39: Updates (in yellow) to content supporting conceptual framework, CF4

The ‘planning horizon’ was removed as an explicit element and built into the description of the ‘scope’ contingent variable. The case study showed that as a mature S&OP, it was a given that data should be presented out over a horizon >24 months. In the case study, data was presented out through the end of 2025, giving >30 months visibility to the projections.

An emerging element associated with the ‘Scope’ contingency variable related to the data templates that were deployed in the review meetings designed to direct attention and discussions onto the right topics. This was a key enabler to running an efficient process and ensuring that the attention of the teams could be brought to bear quickly onto the areas where discussions and/or decision making was required. Also the consistency of the templates for the various type of topics for discussion across the reviews was important for efficiency, especially when some people attended multiple reviews. Such templates were in place for presenting information across all the reviews (e.g.:- Product Roadmaps, Project Roadmaps, Capacity projections, Vulnerabilities & Opportunities, Assumptions).

As mentioned in reference to Figure 6.38, the evidence from the case study showed that certain review meetings were particularly relevant when it comes to enabling SA discussions and decisions. In particular, the longer-term project activity tied to Product Portfolio Management and Strategic Projects Management were key to delivering the expectations of the longer-term strategic plan. For this case study the importance of strategic projects was

recognised by structuring a specific review meeting to track performance and enable actions to stay on track. Therefore, it was deemed appropriate to explicitly identify 'strategic projects management' as a response variable under the contingency theory based framework.

The case study also demonstrated that managing assumptions and ensuring they are explicitly stated in the process was a key enabler to triggering the SA discussions. Therefore 'Assumptions Management' was extracted and defined as a response variable.

In terms of the efficiency variables, a performance variable, 'strategic discussions', was introduced in addition to the 'strategic decision making' variable. The evidence from the case study showed that there can be occasions where SA discussions indicate SA achievement, which may not require SA decision making at that time. Therefore, evidence of either one is an indication that SA has been achieved.

The relationships at an overall level supported the research propositions (RP1-RP4) that a set of contingency variables enable a set of response variables and if the capability of the response variables is at a level dictated by the contingency variables (i.e. a fit has been achieved), then the set of response variables will enable the achievement of SA as demonstrated by the efficiency variables. Through the case study analysis it was evident that there are many relationships in play between the contingency and response variables when a specific SA instance is observed. This is reflective of the *"system"* (Sousa and Voss, 2008) form of fit in contingency theory where there can be multiple relationships between the contingent and response variables. However, the case study highlighted the higher order capability of achieving a collective 'growth mindset' is an essential requirement for all contingent-response relationships that trigger SA discussions / decisions.

Taking all of these elements together they provide insights to addressing research question 1 (RQ1):

RQ1: To what extent does the evidence, from an investigation of an exemplar case study, support the constructs and relationships as defined by CF3.

The overall structure of the framework was supported by the evidence from the case study and therefore provides guidance to practice in achieving 'SA in S&OP'. Research Proposition 1 (RP1) was supported in that a set of contingency variables showed to have a direct influence on the enabling role of a set of response variables in achieving SA. While there were more informed conclusions on some of the elements within the contextual and response variables, the contingency theory based framework proved relevant in practice."

Research Proposition 2 (RP2) referred to the role of the closed loop feedback to maintain a fit between the response and contingency variables. This also proved to be the case in practice with the case study business ensuring that the feedback loop was triggered by conducting self-assessments at the end of each of the review meetings. Based on the trending results key actions were prompted by the IBP Process Leaders (e.g.:- Education programme initiated for the Quality organisation based on capability gaps identified). With education a key trigger from the feedback, this was added to the description in the diagram.

The third Research Proposition (RP3) set an expectation that a growth mindset would be evident once the response variable processes were capable of delivering SA. This was very evident from the analysis of 'SA in Action', when strategic discussions were enabled and when SA discussions were missed, due to lack of a collective growth mindset.

The final Research Proposition (P4) associated with RQ1 proposed strategic decision making as an indicator of achievement of SA. The analysis of 'SA in Action' demonstrated that whenever strategic decision making was evident it was supported by all the elements of the CF being deployed (e.g.:- Product and Projects Reviews). However, it was also identified that SA can be achieved without strategic decision making, hence the additional performance variable to acknowledge that SA discussions were sufficient to indicate SA had been achieved. Therefore, RP4 proved to be valid but not sufficient.

6.4.3 Integrating in the Planning Hierarchy perspective

From the analysis conducted the positioning of the IBP process in the tactical planning horizon with linkages to the strategy management process and the operations planning process, became clear. There was a "top-down" priority of setting direction from the strategic plan to the IBP plan over at least 36 months of the 5 year strategic plan horizon. In turn the IBP plan provided "top-down" direction to the operations plan over the 0-3 month short-term horizon. Hence the solid down arrows depicted in the final framework (CF4).

What was also evident from the analysis was that there was continuous feedback on a monthly basis from the IBP plan to the strategic plan, where formal approvals were provided by the corporate entity on requested changes, with the formal strategic plan ('strat plan') only updated once a year. From an operations planning and execution perspective, the demonstrated performance of the business relative to the expectation as set out in the plans, was fed back into the IBP process in the form of reviewing the latest business performance

KPIs. This provided a baseline performance to test how realistic the future plans were in the IBP review meetings. Both of the feedback loops from IBP to the strategic plan and the feedback from operations planning and execution to IBP were shown as dotted feedback lines in CF4. This is to indicate that there was not an expectation that valid information which affected SA discussions would necessarily be fed back on a monthly basis, but when required it would influence SA discussions/decisions.

The observations and subsequent analysis, related to the positioning of S&OP in the planning hierarchy, were key to addressing the second research question (RQ2).

RQ2: How does the positioning of S&OP in the planning hierarchy affect the enablement of 'SA in S&OP', as evidenced when investigating an exemplar case study?

The associated Research Proposition (RP5) indicated the importance of the positioning of S&OP in the planning hierarchy with two-way linkages to the strategic and operational planning levels. The analysis painted a picture that very much supported RP5. The evidence gathered provided further insight to show that while the two-way linkages to strategic and operational planning were present, they were not of equal importance. The 'top-down' direction provided from the strategic plan to the IBP plan and from the IBP plan to the operational plan carried a higher weighting versus the feedback 'bottom-up' from operational planning to IBP and from IBP to strategic planning. This had a direct influence on SA whereby the drive of the IBP teams was always to try and resolve any gaps to the 'top-down' strategic plan by making changes to the 'bottom-up' IBP plan first and only driving changes to the strategic plan when all IBP related actions were exhausted. Likewise the short-term operations plan was driven by the IBP plan and only when the execution was not in line with the plan (as shown through the KPIs) a feedback loop triggered to IBP to assess the impact to future plans.

6.4.4 Achieving the Growth Mindset Capability

A significant contribution from the case study was an understanding of what is required to develop the growth mindset capability, which showed to be essential in delivering 'SA in S&OP'. There were differences in the capabilities of the teams when SA discussions/decisions were enabled versus when a missed discussion/decision was encountered. These capabilities, when analysed through the lens of Dynamic Capabilities (Nicolas et al., 2020), provided a comparison of categories of capabilities that can be

positioned in a matrix of increasing capability (see Figure 6.40). What emerged is that the teams involved in the IBP reviews needed to have a collective capability aligned with *"Strategic Capabilities"* as a minimum to deliver a growth mindset to enable SA.

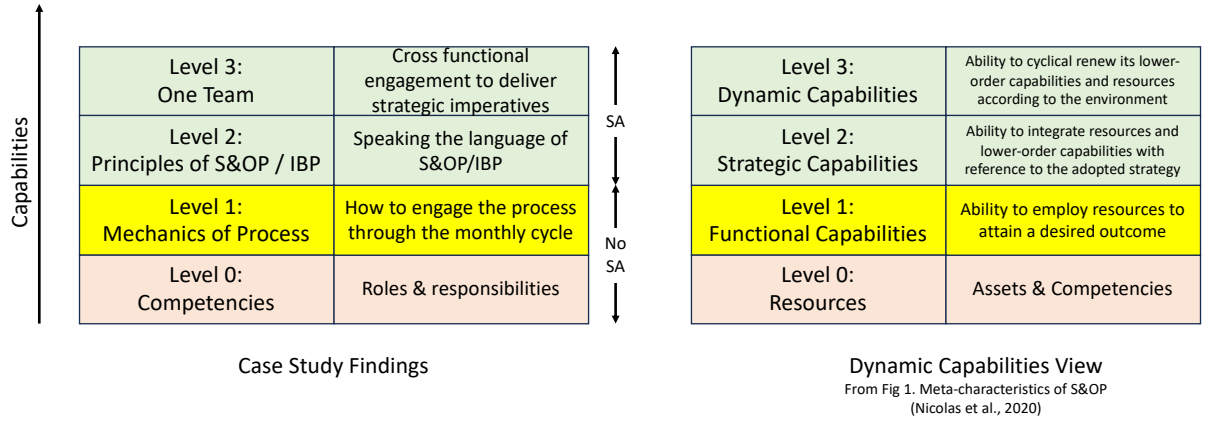


Figure 6. 40: Alignment of case study observed capabilities with Dynamic Capabilities View

At the strategic capabilities level 2, the case study business IBP teams were observed speaking the language of IBP. The orientation was very much on building a robust future plan and this entailed challenging the assumptions, vulnerabilities, opportunities and ultimately testing whether the latest plans were aligned with the strategic plan. A summary perspective of the capability levels across the IBP reviews shows the Product and Projects reviews to have demonstrated the highest level (dynamic) capabilities as shown in Figure 6.41.

Level	Dynamic Capabilities View	Case Study IBP Capabilities	Capability Level Summary by IBP Review							
3	Dynamic Capabilities	One strategically focused team	Product Review	Projects Review						
2	Strategic Capabilities	Principles of S&OP/IBP evident			Demand Review		SPO Review			
1	Functional Capabilities	Mechanics of S&OP/IBP in place				Supply Chain Review		MPO Review	IR Review	MB Review
0	Resources	Individual competencies								

Figure 6. 41: Capability levels in support of SA from observing Reviews

The criteria for determining the capability level and the associated analysis is shown in Appendix 6.6. With the IBP plan built 'bottom-up', it was reflective of the latest environmental conditions and in many cases this resulted in proposing changes to the strategic plan. In the case of the Product Portfolio and Projects reviews in particular there was

evidence of the collective 'growth mindset' reaching dynamic capabilities (level 3), whereby the functional roles became blurred as the entire team worked together as a unit to optimise the plans for the future and make adjustments to the strategic direction, based on the latest knowledge on future projections and the strategic landscape. Such capabilities are evidence of the organisation achieving ambidexterity (Gibson and Birkinshaw, 2004) where as part of the organisations dynamic capabilities they demonstrate an ability to align resources to deliver the business needs, while also adapting to environmental changes. It is informative that Product and Projects Reviews demonstrated the highest level of capability related to delivering 'SA in S&OP'. These reviews by design are focused on the strategic growth of the business through making changes to the product portfolio and executing strategic projects to position future competencies. The case study demonstrated how central these reviews are to achieving the *strategic alignment* ambition of S&OP/IBP.

While the evidence from the Demand Review and Steriles Supply Review (SPO) indicated a capability reflective of level 2 (Strategic Capabilities), there were sufficient examples to show that the collective growth mindset was sufficient to deliver SA. Therefore, the case study showed that a mature S&OP process (IBP) with an organisation capability at level 2 or above, can simultaneously achieve *"exploitation"* of resources to deliver the business for today and *"exploration"* of potential changes to the strategic plan based on latest assumptions of the future strategic landscape. This is what O'Reilly and Tushman (2004) refer to as *"contextual ambidexterity"* and when achieved is a demonstration of higher order dynamic capabilities (Gibson and Birkinshaw, 2004).

Interestingly, even though 'BigPharma' were positioned as an exemplar case study for 'SA in S&OP', the evidence from the remaining other four reviews indicated a functional capability level (Level 1). As demonstrated by the findings (section 6.2.1) a key insight was when the dynamics within the review meeting was such that the behaviours reflected a lack of trust in either the data or the presenter, then the strategic focus of the team was impacted. In the case of the quality organisation in 'BigPharma' their functional capability positioning was evident and it had an impact on the collective when it came to engaging the required longer-term related discussions. However, as discussed in section 6.2.2, when it came to strategic alignment (*vertical alignment*) the most influential reviews were the Projects and Product Portfolio Reviews, with the Demand and Supply reviews being more central to the demand-supply balancing activities (*horizonal alignment)*. Also, when the topics for discussion did

not involve the quality organisation, then strategic discussions were evidenced in these reviews (especially the IRR and MBR), even when the quality personnel were present.

The recognition that it takes time to build to the levels of strategic and dynamic capabilities is supported by the studies conducted by Gibson and Birkinshaw (2004). They advocate that a supportive organisation context can be created to build contextual ambidexterity over time. In the case study the supportive organisation context is created through the monthly cadence of the IBP process along with the promotion of the IBP principles. The principles in particular provide a vehicle for the teams to conduct self-reflection to maintain awareness on delivering the full ambition for the process through creating the right organisation mindset (*growth mindset*). The ambition is to deliver on the strategic goals of the business which can only be achieved if strategic alignment is enabled. Gibson and Birkinshaw (2004) concluded that core to creating the right organisation context was the interaction of *stretch, discipline, support and trust* (see hypothesis 2, p.214). With the framework of IBP, the case study showed that to develop the required growth mindset for SA required always trying to close the gap to the requirements of the strategic plan (*stretch*). In addition the case study demonstrated the need for *discipline* and *trust* which were explicitly called out in CF4.. The fundamental importance of *trust* was demonstrated when the team resorted to challenging the data and the presenter, instead of determining what actions needed to be taken, when trust was not evidently present. The case study also endorsed the requirement for strong leadership (*support*) demonstrated by ensuring that each of the IBP review meetings was chaired by a member of the leadership team of the business. Therefore, parallels can be drawn with the studies conducted by Gibson and Birkinshaw (2004) but the conceptual framework emerging from this research goes further in showing how to leverage a well established process of S&OP/IBP to achieve *contextual ambidexterity* leveraging *dynamic capabilities*.

Therefore, the case study provided support for Research Proposition 3 (RP3) that a growth mindset would be evident for SA to occur. In addition it provided a much deeper understanding of what this means in practice. This has implications for organisations of how to go about extracting the best value for their S&OP/IBP processes by building the dynamic capability over time. This is discussed in more depth in the next chapter.

6.4.5 Case Study Context

As mentioned earlier in chapter 3, in case study research the context is an integral part of the investigation (Ridder, 2017). It can be a key determinant when suggesting how generalisable the results are. Of the information gathered through the up-front discussions with the IBP Process Leader (IBP_LED1), a contextual picture of the case study business emerges. Some of the significant context based considerations of 'BigPharma' as it relates to the results are as follows:

- ⇒ Pharmaceutical company
- ⇒ Very large
- ⇒ Manufacturing entity within a bigger corporation
- ⇒ Located in Ireland
- ⇒ Low volume, high complexity, high value products
- ⇒ Customised IBP steps for Strategic Project Portfolio Management Review, Supply Chain Management Review and Demand Management Review.

Other relevant contextual information highlighted some supporting processes that had an impact on the achievement of SA. They were:

- ⇒ A monthly process for informing and getting approval for changes versus the strategic plan and an annual process for formally updating the strategic plan.
- ⇒ Overarching strategic pillars ('BigPharma' called them Compelling Business Needs) to set the overall direction and provide guidance for strategic decision making.
- ⇒ Education processes existed but weren't always followed.
- ⇒ An operational planning process that involved daily and weekly operational meetings that linked to the monthly IBP process.
- ⇒ Even though it was a manufacturing entity the Demand review meeting provided opportunity to keep site informed of long-term demand changes.

All of these elements need factoring in when considering how generalisable the results are. The ambition of organisations to achieve 'SA in S&OP'/IBP is relevant across contextual boundaries in terms of industry, size and geographical region. Companies who embark on an S&OP/IBP journey are doing so because they want to be more proactive about planning their business over a longer-term horizon.

When considering the Conceptual Framework (CF4) that emerged following the completion of the case study one consideration is the contextual influence of 'BigPharma' as a Pharmaceutical (Pharma) organisation. There could be an argument that the Pharma industry sector is conditioned to have a longer-term mindset due to the long lead-times associated with bringing products to market. Many drugs can go through 10 years of development before the regulators approve for manufacture and distribution to patients. During the phases of development many drugs fail to meet the regulation barriers and end up being removed from the product portfolio strategic roadmaps. Such characteristics drive the need for a formal planning process like S&OP/IBP but does not detract from the challenge of how to build the capability within that process to maintain Strategic Alignment (SA) and trigger the required discussions and decisions. The findings from this case study demonstrate how the IBP processes can be leveraged to build dynamic capabilities through the iterative cycles and feedback, to not alone maintain the link with the strategic plan, but also to adjust resources or reset the strategic direction when misalignment occurs. So despite the contextual recognition of a longer-term orientation in the Pharma industry, the learnings of how to build the intangible capabilities to deliver SA should be relevant across industry sectors. However, it would be informative to validate this through conducting further case studies in different industry sectors.

6.4.6 Quality of Results

The principles as outlined by Yin (2009) were employed when striving for high-quality data analysis. Namely:

- Attend to all the evidence.
- Address all major rival interpretations.
- Should address the most significant aspect of the case.
- Use your own, prior, expert knowledge.

There was a vast amount of data and evidence associated with the case study process. All evidence had to be attended to with data reduction activities through the iterations to hone in on the most relevant insights. The database that was constructed from the start was a great help when it came to organising the data as it progressed from the capture to the analysis stage in particular. The database structure evolved accordingly and by completion of the data analysis phase the structure of the database was as shown in Figure 6.42.



Figure 6. 42: Case Study Database Structure

With support of the database, it was possible to attend to the complete set of data while being able to zone in on the most significant areas as they related to the RQs and RPs.

The process of assessing potential rival explanations was ongoing throughout the case study process. An initial list was provided through the research protocol and was updated throughout the iterations of analysis, as other potential explanations were triggered for investigation. The diagram in Figure 6.43 shows the database entries of potential rival explanations that were considered and how they were addressed.

No.	Rival Explanations	How validate?	Findings	implications
1	Pharma industry is the driver of longer term discussions / decisions out of necessity	Are there discussions/decisions that are not unique to Pharma?	Warehouse ambient capacity discussions would be relavant to any manufacturing industry. However it is fair to say that Pharma by the nature of the Product Lifecycle lead-times are more longer term focused by nature.	Should not generalise beyond the Pharma industry
2	Product Review and Strategic Projects by their nature will be focused on longer term	Compare Product/Projects Reviews versus other Reviews	Yes - But this is what would be expected of any IBP process. Not to say that other reviews are not long term focused (eg:- Warehouse capacity in SC Review or Capital investment in new Zwick in Ops/MBR)	Profile which reviews may be more relevant for SA versus others
3	Timing of annual SP process when conducted the CS meant more interest on SP alignment ?	Interviews to understand the SP process and how alignment occurs throughout the year.	Changes to Strat Plan (eg:- Product roadmap changes) are approved at site and then at Corporate before finalised => Strat Plan is dynamic in nature even though formal plan only gets updated once a year.	Depict the ongoing dynamic aspect of the linkage between IBP and the strategy management process.
4	Long term strategic decisions are being made based on latest market dynamics indpendent of SP and therefore SA	Investigate through interviews how the Strat Plan influences the discussions / decisions made.	CBNs provide an overal direction and then the annual strat plan is supported by a strategic presentation pack presented by the MD and approved by Corporate to be in line with Corporate Strategy.	Depict the ongoing dynamic aspect of the linkage between IBP and the strategy management process. Also explain the 'Control' versus 'Growth' tied to 'Horizontal' V 'Vertical' alignment where supply reviews are naturally more about Control/Horizontal and Product/Projects more about Growth/Vertical
5	Is the update of the Strat Plan process context specific to this Company? How much can generlaise from this?	Implication of being a single case study	Dynamic process in place for staying aligned with Corproate and within the guiderails of the strategic direction of the business (CBNs)	Can't generalise but can present as a real-life example of how one organisation makes that closed loop link with the strategy management process. Deep description of how it occurs.
6	Are key strategic decisions being made outside of the IBP process and just being presented in the reviews for information sharing purposes?	Understand the feeder processes to the reviews	Product has a comprehensive S&G process where key decisions are made at gate reviews. However, overall roadmap changes have to be ratified in the Product review to ensure alignment across all key functions. All key decisions that affect what has been signed up to in the Budget / Strat Plan ultimately get reviewed and ratified at the MBR, regardless of the feeder processes.	Does not affect the CF construct but should be covered as part of the context for the reviews.
7	Chair of MBO Review does not like QAL and so steers discussion to be criritcal of data presented and creates a lack of trust environment	Evidence in the reviews would indicate that the Chair is very supportive and offers help to Quality.	See quotes in the Data Capture files from the MBO Supply reviews by MBOCHA1.	Missed Decision analysis is valid.
8	How many of these elements are already known in practice and are part of a typical implementation approach (eg:- OW Class A)?	Many of the elemtns are known except for the detail behind the "Growth Mindset" and how to achieve it. Would drive an update to the OW approach of implementing IBP.	Capability development over time to build Growth Mindset (DCV lens provided clarity).	Conclusions for practice - propose a different approach whereby Growth Mindset capability requires separate intervention after a number of cycles of running the process (up to 12 cycles).
9	Last MBR was best for 'Growth Mindset' - was this due to researcher being physically present?	Chair did make a comment to that effect.	Strong cross functional engagement on the topics versus what had been observed in previous two cycles.	Not impact conclusions re: a developing SLT team.
10	Site level IBP versus Business wide IBP (eg:- Demand Review very different). So not expect the Demand review to be making decisions when compare to other reviews.	This is a valid explanation for lack of SA decisions in the Demand Review.	See diagram showing profile of SA across the reviews.	Not impact on conclusion that Product and Projects Reviews are primary SA reviews when it comes to vertical alignment aspect of SA in particular.

Figure 6. 43: Rival Explanations Listing

The items highlighted in yellow (items 1 & 5), indicate that in particular when it comes to generalising the findings the case study has limitations. Item 1 is about recognising that the cycle times involved in Pharma are such that they have a greater need than most industries to be planning over the longer-term. Therefore, one needs to be cognizant of this context if generalising the findings beyond the Pharma industry. Item 5 challenges the process identified for maintaining alignment between the IBP plan and the strategic plan. With this being a single case study then one needs to be careful not to generalise that this is a process that would be used by all companies.

The other items identified as potential rival explanations were investigated through the observations and interviews conducted and conclusions drawn that they were sufficiently addressed by the evidence.

The research protocol document (see Appendix 6.1) provided constant guidance to ensure that the most important aspects of the case were attended to and other interesting, but beyond scope, topics were not engaged. The data capture template shown earlier (Figure 3.4) was also a key support encouraging the capture of key observations live and then filtering immediately after the review meetings to determine what was really relevant to the research questions and research propositions as outlined in the research protocol.

In line with the principles from Yin (2009), one of key benefits when conducting this case study was the experience and expertise that the researcher was able to bring to bear. With over twenty five years experience of S&OP/IBP, including 10 years as an S&OP/IBP consultant, it supported an appreciation for the various conversations observed and an

interpretation of the key dynamics in play. This can also come with a risk of bias. This risk was minimised through following recommended research practices built into the case study research design, namely:

- Conducting non-participatory observations, with the review meetings conducted remotely, with researcher camera off.
- Leveraging the research team of three to test justification for insights and findings.
- Constantly looking for and documenting potential rival explanations.
- Ensuring the key findings resonated with the case study business.

Following the guidelines provided by Miles and Huberman (1994) multiple sources of evidence were engaged from observing the review meetings, interviewing key informants and analysing the review meeting information packs. By periodically reviewing the data and preliminary findings with the broader research team of three, differing perspectives were debated which supported the iterative analysis process before final findings were concluded. To achieve this the research team met formally at the start of the case study to review the research protocol, mid-way through the case study to review progress and initial findings and at the end of the case study before final conclusions were made. At two stages of the case study, feedback was sought through presenting key findings to the case study business, 'BigPharma' and seeking feedback on whether the findings resonated with them. The first engagement was following the final Management Business Review (MBR). With all the executive team present, an extra 30 minutes was scheduled such that following the review meeting the researcher could present some key findings and seek feedback from the team. This proved valuable in confirming preliminary findings. Some quotes from the senior leadership team related to specific topics are shown in Table 6.6.

Table 6. 6: Feedback from ‘BigPharma’ on preliminary findings

Topic	Feedback from ‘BigPharma’
Three levels of SA capability presented in building growth mindset	"Need to revisit Education and ensure a more structured approach is in place to progress organisation towards Level 3 capability" - IBP_LED1. Endorsed by SLT_CHA1.
Showed that lack of trust in the presenter or the data prevents SA to occur	"Primary issue is trust in the data to be fair" – SLT_MBO1.
Highlighted the importance placed on the data templates when presenting information	"Working to identify such areas for template improvement and consistency applied where possible" IBP_LED2
Suggested that the Product and Projects Review are most important reviews for SA	"Product Review is probably the most important review for SA as it attends to the longer-term and is always aligning to the Product Roadmap. Projects review is key to positioning our future capability to be able to bid for key Products" – SLT_PRO1.

The second feedback session occurred one month after the case study had been completed and a final report was available. Before the report was issued to the leadership team a meeting was held with the two IBP Process Leaders (IBP_LED1 & IBP_LED2) to test if the final conclusions resonated with them. In summary there was full agreement with the case study results. Table 6.7 shows the key questions that were posed and a sample of the responses from the IBP leaders.

Table 6. 7: Feedback from IBP Process Leaders

Questions Posed	Overall Response	Relevant Quotes
Does the construct of the CF make sense as it has been explained?	Y	"We probably were not diligent enough when new people came in to ensure that robust education was revisited. Especially for some key roles. Caused a dilution in some reviews like you witnessed in MBO" - IBP_LED2.

Do the elements within the CF resonate based on your experience?	Y	"At the start the IBP principles were just words but then over time people started to appreciate how they can be used to challenge our thinking" - IBP_LED1.
Are there any elements that you would question in terms of relevance?	N	"From my experience I fully agree that SA does not happen without the right mindset oriented towards delivering the strategic intent of the business. However, I would say that the elements are connected: Leadership commitment is required first or nothing happens. Then defining R&R clearly. Driving the required discipline in the prep and review execution is next. Can then work on the adjusting and alignment of templates for effective communications. Ultimately over time this will deliver the level of trust required to have the right team mindset for SA" - IBP_LED2.
Do you agree with the position of financial integration and scenario planning as moderating factors?	Y	"As you will have seen in the reviews, there may be recommendations for decision but most decisions will end up in the MBR with the SLT. They will not make a decision without scenarios and financial implications clearly stated" - IBP_LED1.
Are there any other elements that you think are missing in support of enabling SA?	N	"As we are a site as part of a bigger corporation, their influence on us is critical to our scope and authority when it comes to decision making. The key was that we stay aligned with this through the 'strat plan' and key external forums when things need to change between the annual cycle updates" - IBP_LED2.

A significant acknowledgement of the findings was a set of actions that the case study business embarked on based on the feedback. These included:

- Re-structuring their IBP education programme to address the three levels of capability to be built, aligned to the specific roles that people had in the process.
- Updating their self-assessment template at the end of the review meetings to further emphasise the importance of the IBP principles in driving the organisation mindset.

- Putting a formal quarterly process in place to review the trends from the self-assessment scoring to determine what foundational aspects for success needed revisiting.
- Reviewing all the data templates used across the reviews to ensure consistency aligned to key topics.

In summary, validation of the findings was achieved in the four aspects outlined by Yin (2009) and captured in the research protocol:

- *Construct validity* – Triangulation of the evidence captured through observing the review meetings, targeted interviews and support from the review meeting documentation packs.
- *Internal validity* – Structured pattern-matching approach when 'SA in Action' was observed, challenged with rival explanations before drawing conclusions.
- *External validity* – Leveraging the theoretical lenses to support the explanation of the phenomenon provided a key contribution of how these theories can be for 'SA in S&OP' beyond the single case study context (this is discussed in detail in Chapter 7).
- *Reliability* – Every step from the case study design as outlined in the research protocol, through data gathering, analysis and interpretation has been mapped out in great detail, with a motivation to ensure the research could be replicated if required.

The transparent approach to data gathering and data analysis provides *credibility* and *trustworthiness* as defined by Saldana et al. (2011). It is expected that through the detailed descriptions that the honesty and the integrity of the researcher comes to the fore.

6.5 Conclusions

The purpose of the case study was to investigate the practicality of the conceptual framework, designed to aid practitioners in addressing an ongoing challenge of how to deliver on the Strategic Alignment (SA) expectation of the S&OP process. The two research questions (RQs) and associated five research propositions (RPs) provided the basis for investigating the SA phenomenon in a single case, who were acknowledged as mature in their S&OP process (which they called IBP).

There was substantial evidence to support the five Research Propositions (RPs) in addressing the two Research Questions (RQs) through the case study research. Thus the core structure of the conceptual framework survived the investigation but was also enhanced by the case study results. Within the theoretically grounded framework, a number of elements were changed or enhanced to provide more practical guidance based on the real life observations. The boundary change to creating a cloud around the "Growth Mindset" is more reflective of the intangible aspects associated with building this capability. The movement of "Financial Integration" and "Scenario Planning" as moderating factors was concluded from the evidence. Identified elements that had more of an influence to 'SA in S&OP' were highlighted in green in the final framework.

The enhanced framework provides guidance to practitioners on how to go about achieving 'SA in S&OP'/IBP. In terms of theory support, the framework was supported by being able to analyse information through the lenses of contingency theory (CT), resource based view (RBV) and dynamic capabilities view (DCV).

So in conclusion the insights when addressing RQ1 support the structure and core elements of CF3 but with some enhancements through empirical observations leading to CF4.

With respect to RP4, the case study evidence would indicate that SA is demonstrated through the team growth mindset and this is an essential requirement to trigger SA discussions, which in turn can trigger SA decisions. Whether it is *sufficient* is difficult to conclude from the case study and would require further research to investigate other potential elements that could influence strategic decision making, even when SA is achieved. For example, it was difficult to ascertain from observing the dynamics of the review meetings whether there were any political influences driving behaviours that could inhibit strategic decisions being made, even when there was a collective growth mindset driving strategic discussions. Based on this single case study, what can be said is there were no observations, when a collective growth mindset was evidenced, that a strategic decision that should have been made, was not made. With this case study being purposefully selected due to its acknowledged maturity in S&OP, this maturity aspect may be a factor as to why no political influences were observed.

The second RQ2 triggered a number of insights building an enhanced understanding of RP5, explaining the linkages between the S&OP/IBP process and the strategic and operational planning processes.

An interesting observation as it relates to future research is that 'BigPharma' were able to achieve 'SA in S&OP' without any specific Information Technology (IT) targeted support. The site did have Enterprise Resource Planning (ERP) and Advanced Planning Systems (APS) through the SAP platform, but no additional predictive or prescriptive data analytics capabilities, as had been suggested from the Delphi findings (see Appendix 4.10). This insight would challenge some of the maturity models presented in the Integrative Literature Review (ILR) that suggested that big data analytics capabilities were required to achieve the full strategic alignment ambition in S&OP (Schlegel et al., 2021).

6.6 Summary

This case study provided a valuable contribution to enhancing the conceptual framework for 'SA in S&OP'. In line with the cyclical research process of alternating between theory and practice, the practical insights from observing three cycles of a mature S&OP (called IBP) process, enabled a further evolution of the conceptual framework. In particular it brought to light practical insights for building the intangible growth mindset.

The next chapter (Chapter 7) will discuss the final synthesis from the research culminating in the case study and draw key conclusions for theory and practice.

Chapter 7: DISCUSSION / CONCLUSIONS

7.0 Introduction

This research was motivated by the experience of the researcher in witnessing first-hand how difficult it is for organisations to achieve Strategic Alignment (SA) in Sales and Operations Planning (S&OP). Through bringing together the existing body of knowledge in the literature combined with expert experiences and best practice in the field, a conceptual framework emerged that is supported by established theories.

An exploratory research approach, driven by a critical realism research philosophy, was appropriate and effective when investigating this phenomenon, as 'SA in S&OP' is a research topic that had not been studied in depth to date.

In this chapter the contributions to theory and implications to practice are explored. The chapter begins with a reminder of the research problem and research objective along with the significant outcomes. The contributions to the theories used as theoretical lenses are then discussed followed by a review of the implications to practice. The chapter concludes with a reflection on the limitations of the research and recommendations for future related research.

7.1 Addressing the Research Objective

The research problem, as outlined in Chapter 1, highlighted that companies struggle to achieve 'SA in S&OP' in practice. This is manifest by the many S&OP implementations that concentrate on the *'horizontal'* integration of balancing supply to demand, which is driven by a *'control mindset'*. The research objective therefore was to determine what factors would enable companies to achieve the *'SA'* aspect of *'vertical'* integration, evidenced by an organisation capability to continually assess the latest S&OP plans relative to the expectations set out in the strategic plan.

The research journey characterised by the evolution of the Conceptual Framework (CF) from CF1 through to CF4 supported the progressive investigation of key contributions from academic and practitioner publications, field experts, theoretical lenses and an exemplar case study. The final conceptual framework, CF4 is shown again for reference in Figure 7.1.

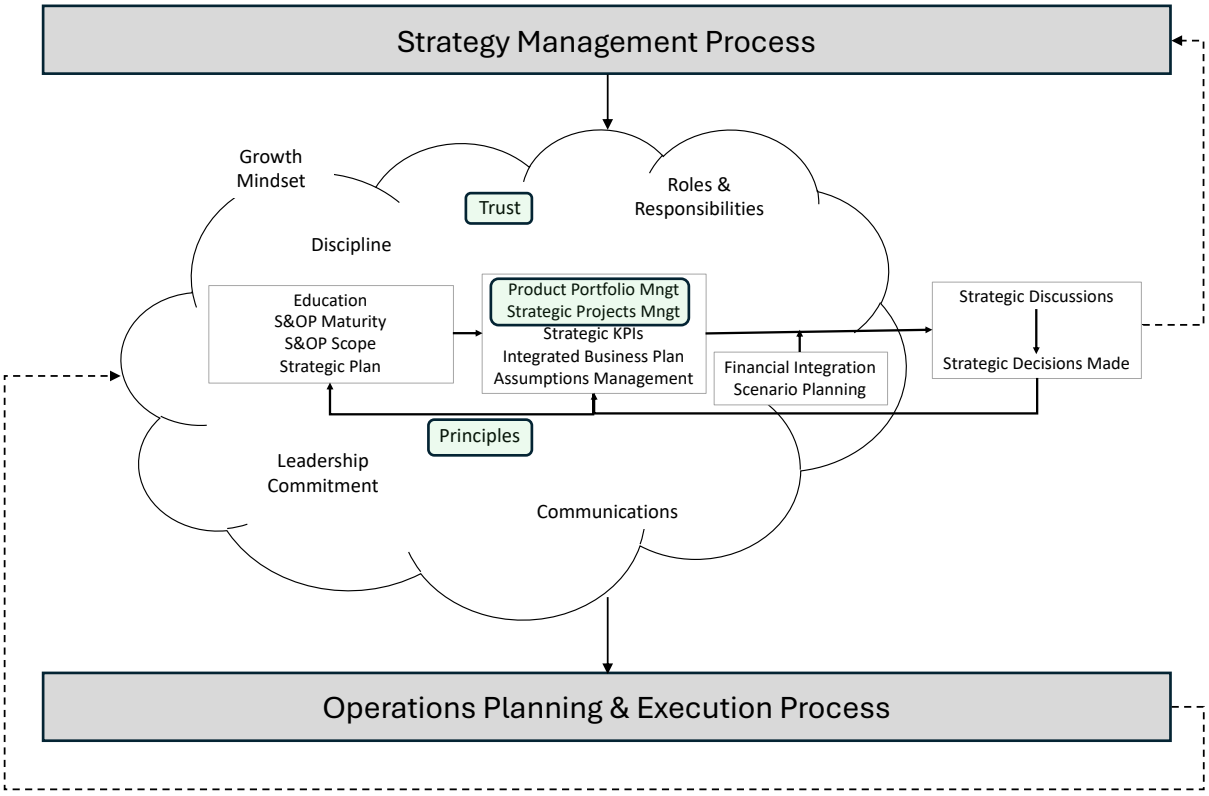


Figure 7. 1: Final consolidated conceptual framework (CF4)

The overall structure and individual elements of CF4 have been discussed in depth in the previous Chapter 6. The evidence from the research confirms that every construct, and associated relationships between the constructs, are essential elements in their own right. However, some elements were identified to have greater emphasis when it comes to enabling 'SA in S&OP' (highlighted in 'green' in CF4). When put together in CF4 it is evident why it has been so difficult in practice to achieve 'SA in S&OP' with CF4 reflecting the complexity of the phenomenon. The next two sections summarise how the specific research questions and associated propositions were addressed, leading to CF4.

7.1.1 Addressing Research Question 1 (RQ1)

The first research question (RQ1) leading into the case study, as the final stage of this research journey, is repeated here for reference:

RQ1: To what extent does the evidence, from an investigation of an exemplar case study, support the constructs and relationships as defined by CF3.

The exemplar single case study afforded the opportunity to observe 'SA in S&OP' in an organisation who had been certified as achieving the Class A standard (Wight, 2017) for their process. Through observing twenty four individual review meetings the patterns of operation and behaviour were reflected on, relative to the constructs and relationships of the CF3 framework. Further to the presentation of the findings in the previous chapter (section 6.4.2), Table 7.1 summarises the impact from addressing RQ1 and whether the evidence supported or refuted the associated Research Propositions (RPs).

Table 7. 1: Summary of impact of CS evidence on Research Propositions associated with Research Question 1 (RQ1)

RQ1: To what extent does the evidence, from an investigation of an exemplar case study, support the constructs and relationships as defined by CF3.	
Research Propositions	**What the Case Study evidence indicated**
RP1: The implementation of the defined set of contingency variables have a direct influence on the enabling role of the set of response variables in achieving 'SA in S&OP'.	Evidence supported overall proposition but drove a change in the make-up of the set of response variables with the addition of 'Strategic Projects Mngt' and 'Assumptions Management' and the moving of 'Financial Integration' and 'Scenario Planning' from response variables to be positioned as moderating variables.
RP2: The capability of the response variable processes, to achieve 'SA in S&OP', is achieved through maintaining a closed loop feedback to the contingency variables, in order to ensure a fit is maintained between the contingency and response variables.	Evidence supported this proposition showing that not only was fit achieved through response variables responding to contingency variables but also when the capability of the response variables were such that it triggered feedback to the contingency variables to conduct an intervention, to ensure a fit was achieved.
RP3: The capability of the response variable processes, in achieving 'SA in S&OP' is demonstrated by a growth mindset in the organisation directly involved in the S&OP process.	The growth mindset was demonstrated through the practice of adhering to the S&OP (IBP) operating principles. The case study provided an explanation of the growth mindset and confirmed when evidenced, 'SA in S&OP' was achieved.
RP4: The presence of strategic decision making is an indicator that SA is achieved in S&OP.	The evidence showed that whenever strategic decisions were made, 'SA in S&OP' was required and without 'SA in S&OP' being achieved, opportunities for making strategic decisions were missed. However, it was also evident that 'SA in S&OP' could be achieved through the discussions held in the reviews but it may not follow that a strategic decision was made, at that time.

Therefore, in addressing RQ1, the case study supported the overall contingency-response structure of the conceptual framework CF3, but triggered some changes to the constructs to better reflect the practice. The insights gained from conducting an intrinsic case study were

evident when observing the role of scenario planning and financial integration which resulted in re-positioning these as moderating factors, rather than response variables. In this regard they are considered to be supportive but not essential for 'SA in S&OP' discussions to occur. The case study was particularly valuable in providing explanatory evidence in support of the individual constructs of CF3. In particular a much deeper understanding of the intangible *growth mindset* construct and the pivotal role it has in achieving 'SA in S&OP'. This is discussed further in section 7.2.

7.1.2 Addressing Research Question 2 (RQ2)

The second research question (RQ2) relates to the positioning of S&OP in the planning hierarchy:

RQ2: How does the positioning of S&OP in the planning hierarchy affect the enablement of 'SA in S&OP', as evidenced when investigating an exemplar case study?

Table 7.2 summarises how the evidence from the case study supported the research proposition associated with RQ2.

Table 7. 2: Summary of impact of CS evidence on Research Proposition associated with Research Question 2 (RQ2)

RQ2: How does the positioning of S&OP in the planning hierarchy affect the enablement of 'SA in S&OP', as evidenced when investigating an exemplar case study?	
Research Proposition	**What the Case Study evidence indicated**
RP5: The positioning of the S&OP process in the planning hierarchy with two-way linkages to the strategic and operational planning levels is an enabler to achieving 'SA in S&OP'.	Evidence supported this proposition while providing further insights into how it works in practice. The 'top-down' direction from the strategic plan to the S&OP plan and from the S&OP plan to the operational plan was found to have a higher priority than the 'bottom-up' feedback loops. 'SA in S&OP' was demonstrated through the teams striving to drive actions and make decisions to deliver on the 'top-down' direction outlined in the strategic plan and only when 'bottom-up' actions were exhausted would recommendations be made to adjust the 'top-down' (strategic plan).

While it is recognised in the literature that the S&OP process operates in the tactical planning horizon (Grimson and Pyke, 2007), the case study reinforced the importance of this

positioning as it relates to achieving 'SA in S&OP'. When SA is achieved the evidence from the case study showed how the organisation continually strived to trigger actions and make decisions to ensure the future plans would meet the strategic expectations. Only when all options to close any identified gaps (bottom-up) were exhausted, would the organisation resort to proposing changes to the strategic plan (top-down). In addition, by monitoring the execution of the operations plan, the S&OP teams would look to reflect the demonstrated performance when discussing the future plans. Therefore, it was evident that the positioning of the S&OP process in the tactical horizon, with linkages to the strategic plan and the operations plan, was an important factor in support of 'SA in S&OP' and associated decision making.

The evidence supporting the importance of the planning hierarchy positioning of S&OP and the explanatory evidence of how it works in practice, enabled an update to the overall structure of CF3 framework to reflect the planning hierarchy positioning in the evolving CF4 framework.

As referenced earlier, a significant contribution from the case study research, were the insights related to understanding in more depth what was meant by the *growth mindset* and how to go about achieving it. These insights and their implications to practice are discussed further in the next section.

7.1.3 Growth Mindset as a Dynamic Capability

This research study has identified that there are many interrelated factors in support of achieving 'SA in S&OP'. However, at the core is a collective organisation capability that is built up over time. This is characterised in CF4 as a *'Growth Mindset'*. The Dynamic Capability View (DCV) theory lens facilitated a perspective to support the understanding of what is required to develop an organisation *'Growth Mindset'* when enabling 'SA in S&OP'. Once the relevance of DCV theory was established, the case study observations provided evidence of what was required to enable strategic discussions and decisions. The non-enabling scenario was also informative from the case study, when strategic alignment discussions were missed, providing the opportunity to investigate what enabling triggers were deficient.

The relevance of DCV theory, when studying the S&OP process, becomes evident when one considers that at the heart of DCV is the concept of building an organisation capability that

can *sense, seize and reconfigure* resources when monitoring the latest business environment (Teece, 2007). The Strategic Alignment (SA) challenge, posed by the definition of S&OP, is to achieve this through a monthly "bottom-up" perspective of the latest business projections (*sense*) and comparing this to the expectations in the strategic plan ("top-down"). Any disconnects should trigger discussions and decisions to close the "gap" (*seize*), resulting in reallocation of resources to bring alignment (*reconfigure*). While S&OP positions the essential processes required to extract the value, the perspective provided by DCV theory affords an appreciation of the intangible aspects involved that are embedded into the organisation mindset (Wang and Ahmed, 2007). It is this intangible aspect that makes it difficult for organisations to achieve.

As presented in the previous chapter the higher order organisation capability required for *'SA in S&OP'* was manifest by the *'growth mindset'* capability. In understanding what this means in practice, the work done by Nicolas et al. (2020) in defining the meta-characteristics of a taxonomy of S&OP capabilities was very informative. The research team included Antônio Márcio Taveres Thomé, who has been a leader in publishing on S&OP research over the last 10+ years. They propose a framework that is based on the hierarchical capabilities structure of Wang and Ahmed (2007) and is aligned with a similar capabilities hierarchy proposed by Hooley et al. (1998). As presented in the previous chapter (and repeated here for clarity) this hierarchical perspective provided a lens into the observed capabilities encountered in the case study.

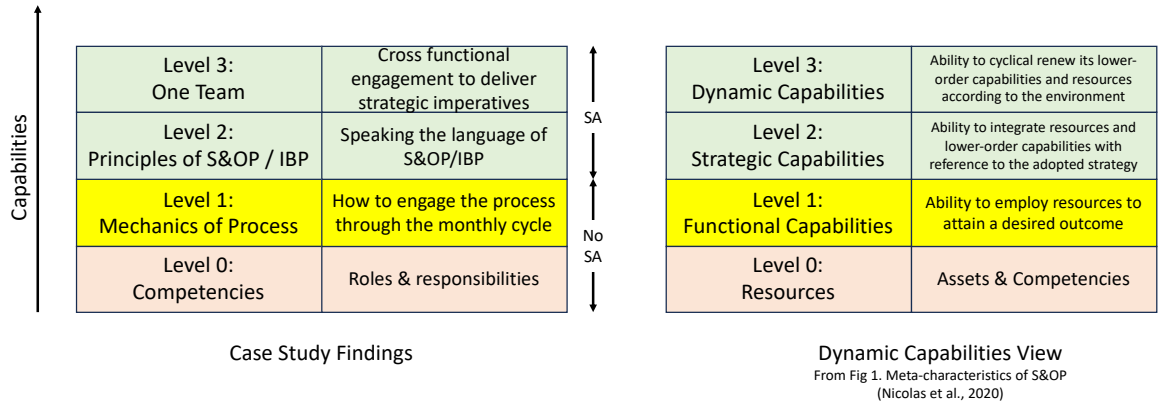


Figure 7. 2:Alignment of case study observed capabilities with Dynamic Capabilities View.

The case study results highlighted that in order to effectively engage SA discussions and decisions the organisation capability needs to be at levels 2 or 3 (see Figure 7.2). This meant that the organisation demonstrated what Nicolas et al. (2020) called *"Strategic Capabilities"* or *"Dynamic Capabilities"*. Given the definition of *"Growth"* as achievement of the strategic plan expectations (adopted in Chapter 1), the DCV lens provided an appreciation of the intangible capability developed through embedding the IBP (S&OP) principles and ultimately creating an organisation mindset that, as a collective unit, is focused on delivering the strategic intent of the business. This capability included the continual monitoring of the latest business environment and adjusting resources accordingly, even if it meant an adjustment to the strategic plan. As evidenced in the case study results, even though an exemplar case study was being observed, there were some examples that showed how one function, who were lagging at the functional capability level, could have a direct impact on the collective team capability to engage strategic discussions, depending on the topic presented. However, this impact was acknowledged quickly by the organisation and was actioned to be addressed through an education intervention. Essentially an intervention to ensure the collective organisation capability could be maintained at level 2 (strategic) at least. In contingency theory terms, an intervention to *regain fit* (Child, 1972, Donaldson, 2001).

The research demonstrated the power of the collective growth mindset when engaging in longer-term discussions and decisions. This is manifest in the form of structured routines to visualise the projected data points in a way that shows where gaps are unfolding between the latest business projections and the strategic plan. The DCV lens supports a view of such higher level capabilities as a *"patterned collection of routines"* (Winter, 2003, p.991). Winter (2003) goes further highlighting that such capabilities *"confers upon an organization's management a set of decision options for producing significant outputs of a particular type"*. The *significant outputs* observed through the case study were focused on delivering the *"growth"* expectations reflected in the strategic plan, whether they be volume growth targets, new product introductions or infrastructure building.

The patterned routines to trigger SA discussions are achieved by having the collective *'growth mindset'* operating in conjunction with a set of key enabling processes. This is where Contingency Theory (CT) and Resource Based View (RBV) theory work hand-in-hand with DCV when understanding the higher order capability for 'SA in S&OP'. Barney (1991) acknowledges organisational processes as firm resources and processes are identified as a key

ingredient to dynamic capabilities (Helfat et al., 2007). The cycle of building the processes to a level *'capable'* of delivering SA is appreciated when one applies the RBV lens to the CT based enabling processes (response variables). The feedback loop as shown in CF4 reflects the iterative drive to build the process capability by striving to achieve a 'fit' between the CT response variables and contingency variables. The field results from the Delphi and the Case Study show multiple relationships between the contingency and response variables. This is what Sousa and Voss (2008) term a *"systems fit"* as opposed to the one-to-one relationships that exist in a *"selection"* or *"interaction"* fit. Therefore, the combination of capable processes with an organisation mindset aligned to delivering the strategic intent for the business is what is required to deliver 'SA in S&OP'.

It takes time to build such a capability. However the DCV lens provides guidance on how to go about building the capability over time. By matching the observations in the case study with the framework proposed by Nicolas et al. (2020) as shown in Figure 7.2, the building blocks for building higher levels of capability over time become evident. While positioning the required competencies (level 0) and creating the mechanics of the monthly S&OP/IBP process (level 1), provide the foundation, it is the practice and continuous learning of how to apply the principles that starts to build the strategic and ultimate dynamic capabilities. By applying and practicing the S&OP/IBP principles the intangible capability reflected by the growth mindset is developed over time. It was observed in the case study as the *"language of S&OP/IBP"* spoken by the teams. The iterative process of feedback, triggered primarily by the self-assessment scoring of the principles in practice, at the end of each review, drove ongoing education and organisation learning. The parallels with organisation learning are highlighted by Hooley et al. (1998) who make the link having reviewed the 'dynamic capabilities' as outlined by Teece et al. (1997) to *"renew, augment and adapt its core competence over time"* (Hooley et al., 1998, p.101). Teece and others explain why it takes time to build dynamic capabilities as they cannot be bought and must be built (Katkalo et al., 2010). The realisation that dynamic capabilities have to be built over time is a significant insight for practice when considering how to go about building such capabilities. This will be revisited later in this discussion chapter when considering the implications to practice.

By identifying the *'growth mindset'* of the organisation as a dynamic capability, the realisation of the value that businesses can obtain from achieving it is significant. When organisations have an ability to adapt to a changing environment then this affords them a competitive advantage (*Prahalad* and Hamel, 1990). When resources demonstrate dynamic

capabilities they meet the *"VRIN"* criteria, namely *"Valuable, Rare, Inimitable and Non-Substitutable"* (Katkalo et al., 2010). This makes it difficult for the competition to replicate. Wrapping this capability into a well-structured S&OP/IBP process with the monthly "drumbeat" that goes with it, means that the business can create a capability that delivers a sustained competitive advantage. The context of the case study showed this in how the 'BigPharma' site was able to strategically adapt their focus to continually grow their business in Ireland while migrating from being a manufacturer of tablets to a strategic biologics site for the corporation. The complexity involved in building the *'growth mindset'* as uncovered through this research, makes it very difficult for organisations to understand how to achieve it. However it is this complexity that is core to maintaining a sustained competitive advantage through "*causal ambiguity"* (Barney, 1991, pp.105-106).

The underlying assumption surrounding dynamic capability building, such as the *'growth mindset'* in S&OP, is that the organisation operates in an ever changing business environment, requiring decisions to be made. In this regard Winter (2003) cautions against the effort and cost of developing dynamic capabilities if there is no reason to change – *"to have a dynamic capability and find no occasion for change is merely to carry a cost burden"* (Winter, 2003, p.993). Having said that, the recent global events such as the global Covid-19 pandemic and the wars in Ukraine and the Middle East have taught us that all organisations have to be ready for change and those who will be successful are the ones who do a better job of anticipating the changes and reconfigure resources in response.

By developing higher level dynamic capabilities, grounded in the monthly tactical planning processes of S&OP/IBP, SA can be achieved. The capability supports businesses to make proactive decisions to realise their future as defined in their strategic plan. Businesses who achieve this level of capability will enjoy a sustained competitive advantage.

7.2 Contribution to Theory

The existing theories deployed as part of this research proved very useful. As explained earlier in Chapter 5, the conceptual Framework (CF2) that evolved following the Delphi study drove the direction in terms of investigating suitable theories. Each theory provided a related perspective to evaluate CF2, allowing a deeper understanding and explanation of the framework. In particular:

⇒ Contingency Theory (CT) supported a perspective on the logical constructs and relationships within the framework.

⇒ Resource Based View (RBV) brought the capability paradigm to bear which was important when understanding that the enabling processes needed to be capable for 'SA in S&OP'.

⇒ Dynamic Capabilities View (DCV) positioned the intangible capability building process, supporting the recognition of the closed loop iterative process to build the *"growth mindset"* over time, which was essential for delivering 'SA in S&OP'.

These theoretical lenses, once established, were leveraged further when investigating the findings from the case study and as such, influenced the explanations associated with the final framework CF4.

However, the true value of the perspectives provided by the existing theories came from the combination of the theories working in an integrated manner to bring clarity and understanding to the dynamics involved in the evolving conceptual framework. As it relates to S&OP this is the first study to leverage the combined theories in this way. That is not to say that researchers have not used these theories in S&OP research before. In Chapter 5 three examples were listed in Table 5.1 where Contingency Theory (CT) was used. Nicolas et al. (2020) leveraged Resource Based View (RBV) and Dynamic Capabilities View (DCV) when identifying the meta characteristics of a taxonomy to represent S&OP capabilities. As discussed earlier the Nicolas et al. (2020) study was informative when investigating the organisation *'growth mindset'* capability. Beyond S&OP specific research, the value that RBV theory brings to CT has been recognised in Operations Management (OM) research. Having conducted an in-depth review of the CT literature, Sousa and Voss (2008) concluded that RBV was one of three theories to address the limitations of CT. In particular they bring forward the argument that RBV introduces the important *capability* consideration of the CT response variables to deliver the desired performance outcomes.

The combination of the three theories in this research has demonstrated how related these theories are and how effective they can be when applied to explore not just what the capabilities look like, but how to build the capability within a key business process, like S&OP. When used as a combined set of theories, practical insights come to the fore. For example, DCV revealed the emergence of a growth mindset over a period of time which is supported by iterations of *"reciprocal causality*" (Donaldson, 2001, p.138) as viewed through

CT. Further, the adoption of a RBV lens highlighted that this occurred when feedback is triggered by the capability of the CT response variables.

This research therefore provides an example for future researchers of how to leverage these theories in a combined fashion, when conducting operations management research into the subject of S&OP.

7.3 Implications to Practice

The significant value of achieving a sustained competitive advantage through achieving 'SA in S&OP' is not something that is explicitly explored in the academic or partitioner literature. As identified as part of the Integrative Literature Review (ILR), organisations do see a value to achieving SA with particular focus on optimisation of revenue and/or profitability (Bower, 2006, Alexander, 2013, Turner, 2018). Perhaps if there was an appreciation that a sustainable competitive advantage can be achieved, then organisations may assign more resources and effort to achieve it and academics may dedicate more research hours to investigate the phenomenon.

The conceptual framework (CF4) provides a guidance framework for organisations of what is involved to deliver this sustained competitive advantage through 'SA in S&OP' and how to go about achieving it. In this regard the overarching research objective has been addressed. One of the significant aspects emerging is that it takes time to build a capability to enable 'SA in S&OP', fuelled by experiences and learning to be able to engage the S&OP/IBP principles and deliver the collective *'growth mindset'*. This has implications on how organisations should go about introducing their S&OP/IBP processes. The study suggests that a two phase approach may be appropriate, concentrating initially on developing the Level 1 capability (S&OP/IBP mechanics) before revisiting with a focused engagement after the organisation have experienced a number of cycles, which demonstrate that the mechanics are well established. An engagement at this point to provide specific education on the S&OP/IBP principles while reflecting on practical experiences to date, would support an organisation to build the Level 2 capability (S&OP/IBP principles). By adopting the practice observed with 'BigPharma' of capturing the trends from self-assessments carried out after the various review meetings (scoring against the IBP principles), could provide direction for the type of interventions required. This in turn would support the building of the *"growth mindset"* over time (Level 3).

The importance of ensuring that the product and projects portfolio is proactively managed through the S&OP/IBP process, as concluded through the case study, supports the elevation of the process from being perceived as a supply chain process to a business planning process. Reflecting on the literature presented in Chapter 2, these reviews proved instrumental in ensuring the organisation moved beyond the *"horizontal"* aspects of supply responding to latest demand plans, to include the "*vertical"* alignment aspects of delivering on the strategic plan for the business. The case study business acknowledged the criticality of both Strategic Projects and Product Portfolio Management by ensuring there was a dedicated review for each of these steps in their IBP process. For practice going forward a key consideration would be to enhance the base design for IBP to include a formal Projects review, which is not called out in the current designs (Oliver Wight International, 2016).

As highlighted throughout the research, the focus on product portfolio and strategic projects management supports the migration of the organisation mindset from one of "*control"* (i.e. how can we ensure that everything is in place to meet the future demand expectations?) to include *"growth"* (i.e. how can we ensure that the plan supports the goals set out in the strategic plan?). These concepts are illustrated in Figure 7.3.

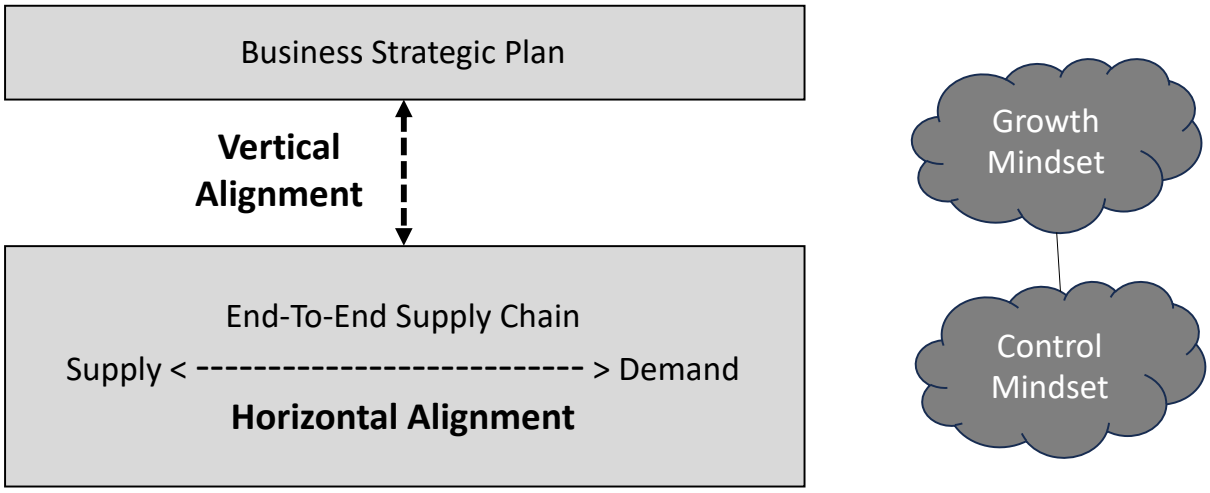


Figure 7. 3: Extending "control mindset" to include "growth mindset"

As referred to in Chapter 6, when 'SA in S&OP' is achieved, an organisation becomes *"ambidextrous"*. As such it leverages the S&OP/IBP process to *"exploit"* current capabilities while *"exploring"* the capabilities positioned in time to deliver the envisioned future. O'Reilly and Tushman (2004) place dynamic capabilities at the heart of an ambidextrous

ability. The practical implication for organisations is that the monthly S&OP/IBP process, when higher order capabilities are in place, supports simultaneous exploitation and exploration. This is referred to as *"contextual ambidexterity"* as opposed to *"sequential ambidexterity"* where organisations are setup to interchange between exploration and exploitation, or *"structural ambidexterity"* where separate units are responsible for exploitation and exploration respectively (O'Reilly and Tushman, 2004). Thus contextual ambidexterity is an efficient approach and is key to delivering a sustained competitive advantage. A recent study by Goh and Eldridge (2024) found that organisations that developed a *"culture of contextual ambidexterity"* within their S&OP processes had a positive influence on supply chain performance through *"allowing S&OP teams to make their own judgments to strike a balance between alignment and adaptability during production planning"* – (p.2). Interestingly they found that this was most positively mediated by *strategic alignment*. In this regard, their findings are in line with the findings of this study.

The cyclical nature of the S&OP/IBP process facilitates the building of the required capability and for the S&OP/IBP teams it creates a learning organisation environment. The knowledge, business intelligence and culture building through practicing the principles, makes it difficult for competitors to tap into the intangible capability and affords the organisation the opportunity to take leadership positions in responding to potential changes in the future.

For consulting companies advising businesses on how to implement S&OP/IBP processes, this research would point to two fundamental changes to the typical approach to support achieving SA and therefore extracting the full benefit from the process:

1. In the core process design ensure there is a separate review meeting for 'Strategic Projects Management'.
2. Conduct a two phase intervention, with the first phase focused on building the 'Mechanics' capability and once the mechanics are established then conduct a second intervention specifically focused on how the principles can be leveraged to drive the required behaviours and build the 'growth mindset', ensuring a closed loop learning environment is established when building the collective understanding.

In summary the conceptual framework (CF4) provides guidance to practitioners in a number of areas. While the overarching research objective sought to understand the factors and

approaches to support organisations to achieve 'SA in S&OP', the research outcome provides a more granular set of guidelines, based on the knowledge gained:

- ⇒ Four areas to be addressed to create the conditions to enable 'SA in S&OP' (i.e. Education, Maturity, Scope, Strategic Plan)
- ⇒ Five processes to build capability over time as key enablers to achieving 'SA in S&OP' (Product Portfolio Management, Strategic Projects Management, Strategic KPIs, Integrated Plan, Assumptions Management)
- ⇒ Implementation of a feedback process to create a closed loop alignment between the capability of enabling processes and the conditions created (i.e. contingency variables).
- ⇒ Through continuous attention to the S&OP/IBP principles, build an organisation mindset that is focused on delivering the strategic plan for the business (i.e. growth mindset).
- ⇒ When enabling strategic decision making, it is helpful to provide scenarios, including the financial implications to the business from each scenario.
- ⇒ Demonstrate the achievement of 'SA in S&OP' through tracking the number of SA discussions and decisions made in the review meetings.
- ⇒ Ensure the links to the strategic and operations planning processes are in place with a capability to have continual alignment, including adjusting the strategic plan if required, based on latest business projections.

By following the guidance provided by CF4, organisations can build the capability of their S&OP/IBP processes to deliver a sustained competitive advantage. That is something that should excite business leaders and cause them to re-look at their S&OP/IBP processes with a renewed sense of the value that can and should be delivered.

7.4 Limitations / Future Research

As this is the first study of its kind to investigate the phenomenon of 'SA in S&OP' the outcome, in terms of the Conceptual Framework (CF4) and the associated explanation, provides a platform for future research on this topic.

There are limitations to the research. While the single case study allowed a detailed analysis, the insights are bounded by the context of the case. In particular, the case study business coming from the Pharmaceutical industry sector and a manufacturing enterprise within a larger corporation, are factors that would warrant further research to examine the conclusions across other industry sectors and also seeking cases where 'SA in S&OP' can be studied within an entire corporate entity. However, as argued in Chapter 5, the premise of aspiring to achieve 'SA in S&OP' has relevance wherever a defined enterprise (business) has a strategic plan and operates S&OP as its enterprise planning process, to support the implementation of the strategic plan. The approach taken to evolve the conceptual framework through insights from theory and practice, ultimately informed by a single exemplar case study, supports the claim that the framework can offer guidance to practitioners. Beyond that, as described by Saldana et al. (2011), it should be up to the reader of qualitative research to decide on relevance based on their own local contexts.

The case study provided evidence to suggest the Product Portfolio Review and Strategic Projects Review meetings were more important than the others when it came to enabling 'SA in S&OP'. As outlined in Chapter 6, the RAG status reflecting this importance could be explained when considering the objectives of these review meetings, in building the future product portfolio and business capabilities for the business, as defined in the strategic plan. However, further studies could be conducted to investigate further the relative importance of the S&OP/IBP reviews for SA.

During the Delphi study and again in the case study there were opinions and observations to suggest that there may be a logical sequence when addressing the contingency variables. The experts in the Delphi provided a range of perspectives on this. If a focused study was to reveal a logical sequence to addressing the contingencies of CF4 this would enhance the CF4 framework and provide a more prescriptive direction for practitioners.

As the conceptual framework evolved over the research study, one of the realisations was that 'Financial Integration' and 'Scenario Planning', while critical elements of the framework, were more appropriately positioned as moderating factors to the performance outcomes of 'Strategic Discussions' and 'Strategic Decisions' being made. As moderating factors they were not considered essential but if present they enhance the opportunity for the desired outcomes. While not observed in the single case study, future research could investigate if there are other moderating factors that could influence the performance outcomes. For example, as discussed in the conclusions to Chapter 6 (section 6.5), while not observed in this

exemplar case study, the political landscape within a given business could impact on whether strategic decisions are made, even when SA is achieved. Another potential moderating factor is that of incentives. It was observed in the case study that incentives were not positioned to support longer-term focus and strategic alignment. Nevertheless the teams demonstrated strategic alignment and strategic decision making. Therefore the role of incentives as a moderating factor is an area for further investigation. In addition, with the accelerated development in IT, including Artificial Intelligence (AI), the augmentation of information and real-time scenarios supported by IT could also be moderating factors in support of enabling strategic decision making, once SA is achieved. Investigating these and potentially other moderating factors could be interesting topics to consider for future research.

Leading from the Integrative Literature Review (ILR) and into the Delphi study, it is evident that the role of Information Technology (IT) in S&OP is continually expanding. From the foundations of ERP and APS systems supporting the horizontal alignment activities of balancing supply to demand, the availability of big data analytics is being leveraged to support decision making. Certainly the expert panel in the Delphi study believed that 'predictive analytics' had a role to play in supporting SA and informing decision makers in S&OP/IBP. They considered that this would play a bigger role in the future. Leveraging the data analytics capabilities the role of Artificial Intelligence (AI) in S&OP is also now being explored. The debate remains as to how far this capability can be leveraged when it comes to 'SA in S&OP' and current literature in the field would indicate that while full automation is well under way in the short term operational planning and execution arena, when it comes to the longer-term strategic decision making, the decision maker will remain actively involved. This will limit the leveraging of analytics and AI to augmenting the decision making process but not automating (Van Hove, 2022). This is certainly an area to consider for future research and empirical evidence from the Delphi expert panel is available (as outlined in Appendix 4.10).

Building on this study, S&OP maturity models merit further attention. The ILR identified a range of models presented in the literature (Thomé et al., 2012b, Danese et al., 2018). With the knowledge gleaned from this research, encapsulated in CF4, one could challenge whether the existing maturity models provide sufficient guidance on how to build an organisation capability to trigger 'SA in S&OP'. With many companies looking to maturity models for guidance to assess their current S&OP capability and to map out a path to increase capability over time, the learnings from CF4 should be incorporated into these models.

There were learnings from the exemplar case study that informed the final evolution of the conceptual framework from CF3 to CF4. A useful next step would be to make an intervention into an organisation who have S&OP but are struggling to achieve SA in S&OP. An action research programme would be very informative to further substantiate the efficacy of CF4 in providing guidance to organisations in the achievement of 'SA in S&OP'

When considering the theoretical lenses that were used to support the findings of this research, there are other theories, that were encountered as part of the research, that potentially could add valuable perspectives to CF4 and the associated explanation of its structure and content. Such theories include the following:

⇒ *Learning Organisation*:

- There are obvious parallels with the theories associated with building a learning organisation and the conceptual framework emerging from this research (CF4). At the core of CF4 is the concept of building a growth mindset enabled through creating an organisation learning environment (Helfat et al., 2007). Authors such as Slater and Narver (1995) describe an organisation's progression from *"Adaptive Learning"* (focused within an organizations current activities) to *"Generative Learning"* (organizations willing to question long-held assumptions about the strategy). They also refer to the terms leveraged in this study, building a capability balanced between *"exploitation"* and *"exploration"*, acknowledging that focus on the latter can be expensive but once the capability is established, it can deliver a competitive advantage (Slater and Narver, 1995, p.64). The model they propose for *"The Process of Organizational Learning"* (p.66), could be another complimentary theoretical lens to examine CF4.

⇒ *Strategy implementation*:

- There are many strategy implementation frameworks presented in academic journals over the years (Okumus, 2003, Kaplan and Norton, 2005b, Srivastava and Sushil, 2017, Tawse and Tabesh, 2021). Given the S&OP strategic alignment goal, this process could be viewed as a vehicle for strategy implementation. While it was argued in the literature review that the S&OP design incorporated the features identified as challenges by these models, applying the strategy implementation theoretical lens could still provide an interesting perspective to CF4.

⇒ *Strategic Decision Making*:

- The research on strategic decision making is vast and various models have evolved over the years. Seminal authors have presented key publications such as, Cyert et al. (1956), Mintzberg (1973), Simon (1997), Humphreys and Jones (2006), Kahneman (2003) and Pomerol (1997), highlighting the process and behavioural challenges when it comes to strategic decision making in organisations. Beyond the focus on achieving strategic alignment in this research, a specific focus on how this in turn enables strategic decision making may uncover other moderating factors related to the enablement of strategic decision making.

⇒ Behavioural Decision Theory:

- As it relates to building the dynamic capabilities within a firm, the research by Amit and Schoemaker (1993) highlighted the role of interorganisational conflict and inertia when attempting to build strategic capabilities (what they called *"the firm's bundle of Strategic Assets",* p.1061). In building such *"Strategic Assets"* they suggest that Behavioural Decision Theory (BDT) adds a relevant dimension to the Resource Based View, when striving to position a capability to deliver a sustained competitive advantage. Applying the BDT lens to CF4 could provide another perspective on the role of organisation behaviour, related to the specific roles within the process, when striving to achieve 'SA in S&OP'.

These theories provide other lenses that could further inform the conceptual framework (CF4).

With respect to the utility of the CF4 framework the core premise of enabling strategic alignment, while investigated within the context of the S&OP process, revealed constructs that could be applied to businesses in general, as they strive to align their organisations to the strategic intent of the business. In particular the premise of building a closed loop learning environment, to build a growth mindset over time, has relevance regardless of the governance process that is deployed in the business for executing strategic plans. A topic for future research could be to explore the relevance of CF4 beyond the S&P boundaries.

7.5 Summary

In addressing the research objective that directed the research journey, as set out in Chapter 1, the framework developed identifies key conditions, enabling processes and capability development, that enable organisations pursue the 'SA in S&OP' goal. To date, this goal is recognised as being a significant challenge for organisations. The research study has been a very valuable exercise to consolidate all the existing knowledge related to 'SA in S&OP' and build a framework, informed by theory and practice, that has real benefit to the business community and provides a platform for future research. As a consultant in the field of S&OP/IBP the researcher has already deployed the concepts of CF4 to a controlled sample of clients and the early results are very positive in building an appreciation of how to get the optimised value from the significant resources organisations commit to their S&OP/IBP implementations.

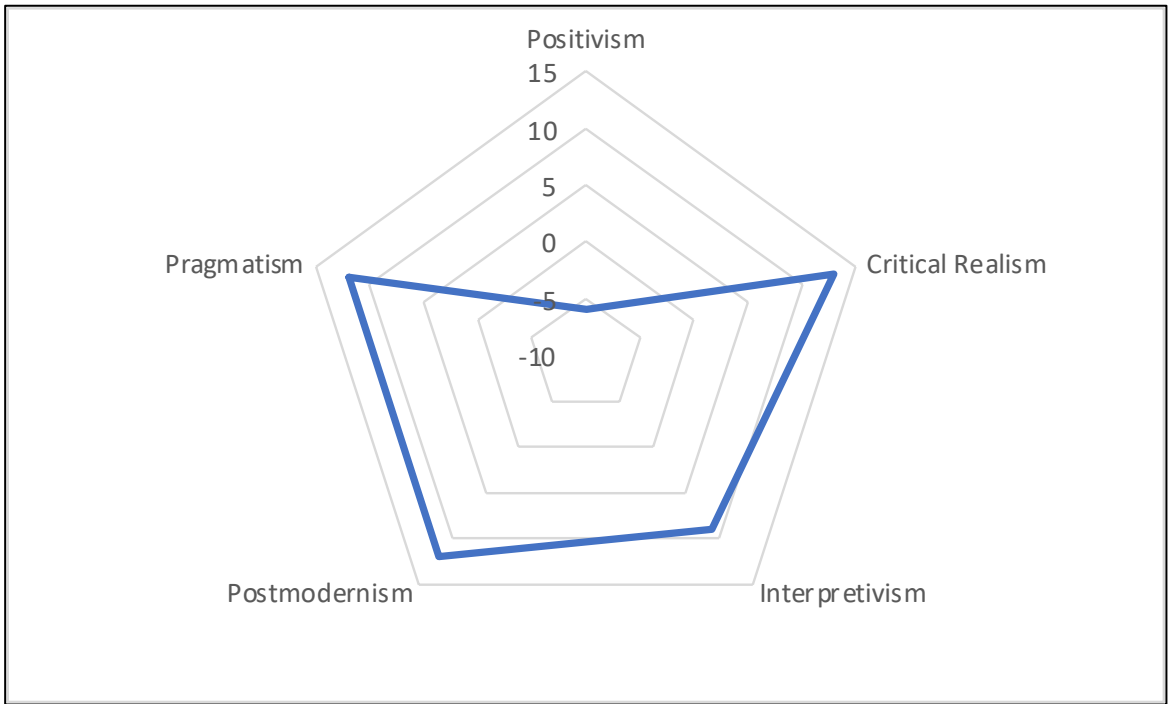
APPENDICES (Aligned to relevant Chapters)

Note that the numbering reference system applied to the appendices is aligned to the relevant chapters they relate to.

For example:

- Appendix 4.x will be an appendix related to Chapter 4.
- Appendix 6.x will be an appendix related to Chapter 6.
- Etc.

Appendix 3.1: Self Assessment HARP profile results for the researcher



Appendix 4.1: Background to Conceptual Framework (CF1) provided to Delphi Study Experts

Background to the Conceptual Framework on Strategic Alignment in S&OP/IBP

The framework as shown in Figure 1 has been created through a synthesis of the published literature to date on the subject of Strategic Alignment (SA) in S&OP/IBP. The literature has a clear definition of S&OP that includes cross functional alignment (horizontal alignment) while also ensuring alignment to strategic planning and operational planning (vertical alignment). The conceptual framework presented here just focuses on the strategic alignment part of vertical integration - see Figure 2. The objective of the literature synthesis is to determine beyond the definition, what knowledge exists in the literature to explain what strategic alignment actually means and how to go about ensuring it is part of the S&OP/IBP process, as per the definition.

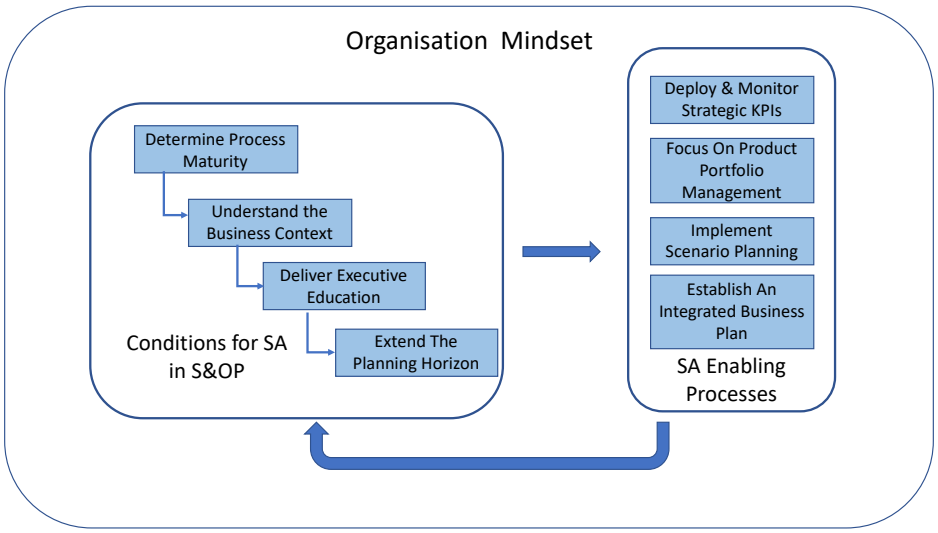


Figure 1: Conceptual Framework of 'SA in S&OP'/IBP

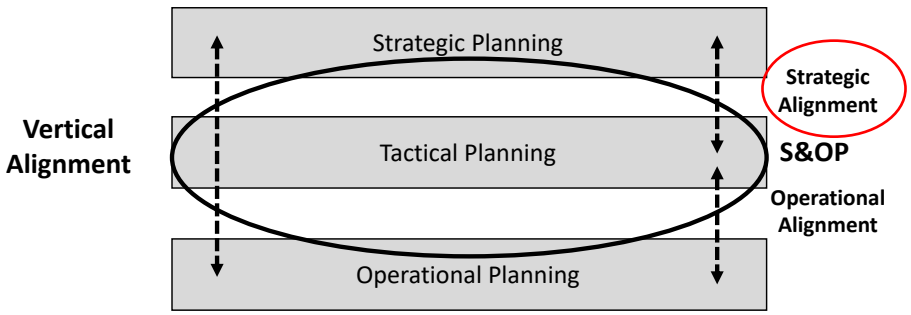


Figure 2: Positioning Strategic Alignment

The conceptual framework that resulted from the literature synthesis can be explained as follows:

The literature throws up a number of conditions necessary to be in place to engage 'SA in S&OP'/IBP. These conditions are also arranged in a sequence starting by ensuring the organisation is clear on the current level of maturity of their current process, followed by being clear on how the specific business context may influence the design of the process. As it is critical to have executives directly involved in strategic decisions, a key activity is to conduct education to align on why SA is important. Coming out of the education one of the most important mindsets is that the organisation are ready for planning over the longer-term horizon (minimum 18-24 months) and the associated decisions that come with that.

With these activities in place, then a number of key processes to focus on, to enable 'SA in S&OP'/IBP, and in no particular order are: 1) Ensure that have KPIs in the process that track the performance of the strategic plan 2) Put a specific focus on managing the product portfolio as a key mechanism to ensure the strategic growth plans of the business are being managed 3) Recognising the uncertainty that comes with longer-term planning, being able to conduct scenario planning is a key enabler to strategic discussions 4) To enable strategic alignment it is essential to have one integrated business plan with particular focus that the financial and operating plans are fully integrated together.

The closed loop feedback mechanism recognises that an iterative process is required to continue to revisit one or more of the positioning activities while striving to achieve full SA.

The model is encapsulated with the organisation mindset towards 'SA in S&OP' to reflect that all elements taken collectively drive a mindset in the organisation which is fundamental to achieving SA and enabling the strategic decisions that are uncovered as a result.

Finally a growing level of sophistication on software tools / applications is assumed to be required as the S&OP/IBP process matures, including the use of APS (Advanced Planning Software) and BDAC (Big Data Analytics Capabilities) at the highest level of maturity, where SA is enabled. This aspect is currently embedded as part of the "Process Maturity" element of the conceptual framework.

Appendix 4.2: Delphi Survey Round 1

Delphi Round 1

Start of Block: Informed Consent

Introduction

Thank you for considering participating in this research project. The purpose of this document is to explain to you what the work is about and what your participation would involve, to enable you to make an informed choice.

The purpose of this study is to investigate the challenges that exist when it comes to enabling strategic decision making through S&OP/IBP. Should you choose to participate, you will be asked to complete a questionnaire which will seek to get your opinions on some pre-determined aspects as well as affording you the opportunity to express your views on the important considerations, based on your experience. As such you will be a member of a small group of experts (approximately 15) whose independent feedback will then be analysed. A summary of the results will then be presented back to you for further comment and input with the intention of achieving an overall view of the most important criteria to consider and how they are related. All inputs will be taken independently to avoid any risk of bias or influence from fellow experts. It is expected that 2-3 rounds of structured questionnaires will be required to complete the study.

Participation in this study is completely voluntary. There is no obligation to participate, and should you choose to do so you can refuse to answer specific questions, or decide to withdraw from the study prior to completing the survey. All information you provide will be confidential and your anonymity will be protected throughout the study. IP addresses will not be collected at any point, meaning the data you provide cannot be traced back to you.

You maintain the right to withdraw from the study at any stage up to the point of data submission. At this point, your data will be collated with that of other participants and can no longer be retracted.

The anonymous data will be stored on a University College Cork supported cloud storage platform - Microsoft One Drive. The data will be stored for minimum of ten years, in line with research code of conduct requirements at the university.
The information you provide may contribute to research publications and/or conference presentations as well as forming part of the empirical data to be used as part of a doctoral thesis.

We do not anticipate any negative outcomes from participating in this study.

This study has obtained ethical approval from the UCC Social Research Ethics Committee.

Note that there are 23 questions to be answered in this survey and the tool will autosave your position if you decide to complete at different intervals.

If you have any queries about this research, you can contact me at my university email or via my mobile phone number: AlanShanahan@umail.ucc.ie (+353-87-2836347)

- ○ I consent, begin the study (1)
- ○ I do not consent, I do not wish to participate (2)

End of Block: Informed Consent

Start of Block: Demographics

Q1 Please select which industry you are working in:

▼ Pharma Products & Preparation (1) ... Other Industry (7)

Q1a If you selected 'Other" then please specify:

_____

Q2 Which title best aligns to your role ?

▼ Individual Contributor (1) ... Consultant (8)

Q3 How many years of experience do you have with S&OP/IBP ?

- < 5 years (1)
- 5 - 10 years (2)
- > 10 years (3)

Q4 Please select the role/perspective that you are answering the subsequent questions on behalf of:

- Process Facilitator (1)
- Review Decision Maker (2)
- Educator / Consultant (3)

Q5 Which Country are you based out of ?

▼ Afghanistan (1) ... Zimbabwe (1357)

End of Block: Demographics

Start of Block: Perspective on SA

Q6 How important is it to have S&OP/IBP process aligned to the business strategy ?

- Not at all important (1)
- Somewhat important (2)
- Important (3)
- Very important (4)
- Extremely important (5)

Q6a Please give reasons for your selection

_____

_____

_____

_____

_____

Q7 In what you typically witness, what horizon(s) do decisions made in S&OP/IBP relate to ? Tick as many as you see in practice.

- ☐ 0-3 months (1)
- ☐ 4-12 months (2)
- ☐ 13-18 months (3)
- ☐ 19-24 months (4)
- ☐ 25 months+ (5)

Q7a Please provide some examples of the types of decisions you are referring to:

_____

_____

_____

_____

_____

Q8 For an effective S&OP/IBP process what horizon do you believe the decisions should relate to? Tick as many as you see relevant.

- [ ] 0-3 months (1)
- [ ] 4-12 months (2)
- [ ] 13-18 months (3)
- [ ] 19-24 months (4)
- [ ] 25 months + (5)

Q8a Please provide reasons for your answer:

_____

_____

_____

_____

_____

Q9 Do you believe that effective Strategic Alignment (SA) in S&OP/IBP would enable strategic decision making ?

- ○ Definitely not (6)
- ○ Probably not (7)
- ○ Might or might not (8)
- ○ Probably yes (9)
- ○ Definitely yes (10)

Q9a Please give reasons for your answer

_____

_____

_____

_____

_____

Q10 What do you see as the main reasons when companies struggle to achieve Strategic Alignment (SA) in S&OP/IBP ?

_____

_____

_____

_____

_____

End of Block: Perspective on SA

Start of Block: Conceptual Framework Critique

Q11 Please review the supporting document that describes the conceptual framework (link below) and answer the subsequent questions

Q11a Click to write the question text

Q12 In your opinion which of the conditions listed for Strategic Alignment (SA) in S&OP are required?

- [ ] Determine Process Maturity (1)
- [ ] Understand Business Context (2)
- [ ] Drive Executive Education (3)
- [ ] Extend The Planning Horizon (4)
- [ ] All of the Conditions (5)

Q12a Please give reasons for your answer

_____

_____

_____

_____

_____

Q13 Does the sequence of engaging the conditions relate in practice or is there an alternative sequence that you believe is more appropriate ? Please explain from your experience.

_____

_____

_____

_____

_____

Q14 What, if any, other conditions are appropriate in support of Strategic Alignment (SA) in S&OP/IBP ?

_____

_____

_____

_____

_____

End of Block: Conceptual Framework Critique

Start of Block: SA Processes

Q15 Which of the Strategic Alignment (SA) processes are relevant to achieve 'SA in S&OP'/IBP?

- ☐ Deploy & Monitor Strategic KPIs (1)
- ☐ Focus on Product Portfolio Management (2)
- ☐ Implement Scenario Planning (3)
- ☐ Establish an Integrated Business Plan (4)
- ☐ All of these processes (5)

Q16 What, if any, other processes should be included to achieve Strategic Alignment (SA) in S&OP/IBP?

_____

_____

_____

_____

_____

Q17 What, if any, is a logical sequence to implementing the Strategic Alignment (SA) processes?

_____

_____

_____

_____

_____

End of Block: SA Processes

Start of Block: Closed Loop / Mindset / Tools

Q18 How important is it to have a closed loop feedback from the Strategic Alignment (SA) processes back to the SA conditions ?

- ○ Not at all important (1)
- ○ Slightly important (2)
- ○ Moderately important (3)
- ○ Very important (4)
- ○ Extremely important (5)

Q18a Please give reasons for your answer

_____

_____

_____

_____

_____

Q19 What are the key aspects to consider in building an organisation mindset to enable Strategic Alignment (SA) in S&OP/IBP ?

_____

_____

_____

_____

_____

End of Block: Closed Loop / Mindset / Tools

Start of Block: Role of IT

Q20 How important are IT tools / applications to support enablement of Strategic Alignment (SA) in S&OP/IBP ?

- ○ Not at all important (1)
- ○ Slightly important (2)
- ○ Moderately important (3)
- ○ Very important (4)
- ○ Extremely important (5)

Q20a If tools / applications are important, which ones do you consider to be relevant when it comes to supporting enablement of Strategic Alignment (SA) in S&OP/IBP ?

_____

_____

_____

_____

_____

Q20b Please provide reasons for your answer

_____

_____

_____

_____

_____

Q21 Considering data analytics, which level of capability do you typically see in S&OP/IBP Reviews (Please tick all that are appropriate)?

- ☐ Descriptive Analytics (i.e. Business reports) (1)
- ☐ Diagnostic Analytics (i.e. Analysis, Visualisation, Drill down, Root cause) (2)
- ☐ Predictive Analytics (i.e. Future projections, Scientific estimates, Future business intelligence) (3)
- ☐ Prescriptive Analytics (i.e. Decision modelling, simulation, optimisation) (4)

Q22 For each of the data analytics capabilities, please indicate how important you see them to be in place in order to enable Strategic Alignment (SA) in S&OP/IBP

	Not Important (1)	Important (2)	Essential (3)
Descriptive Analytics (1)	○	○	○
Diagnostic Analytics (2)	○	○	○
Predictive Analytics (3)	○	○	○
Prescriptive Analytics (4)	○	○	○

Q22a Please provide reasons for your answer

_____

_____

_____

_____

_____

End of Block: Role of IT

Start of Block: Wrap-Up

Q23 Is there any information that you have provided that is company confidential and therefore you would not wish to have included in the rollup of key findings ? Please keep in mind that all data will be aggregated and no names of companies or participants will recorded.

○ Yes (1)

○ No (2)

Q23a If so, please specify.

_____

_____

_____

_____

_____

End of Block: Wrap-Up

Appendix 4.3: Delphi Survey Round 2

Delphi Round 2

Start of Block: Introduction

Q1 **Understanding Strategic Alignment in S&OP / IBP**

Thank you for participating in this research project. Your contributions from Round 1 were very informative and a high level summary which has informed Round 2 has been supplied in the supporting document.

Participation in this study is completely voluntary. There is no obligation to participate, and should you choose to do so you can refuse to answer specific questions, or decide to withdraw from the study prior to completing the survey. All information you provide will be confidential and your anonymity will be protected throughout the study. IP addresses will not be collected at any point, meaning the data you provide cannot be traced back to you.

You maintain the right to withdraw from the study at any stage up to the point of data submission. At this point, your data will be collated with that of other participants and can no longer be retracted.

The anonymous data will be stored on a University College Cork supported cloud storage platform - Microsoft One Drive. The data will be stored for minimum of ten years, in line with research code of conduct requirements at the university. The information you provide may contribute to research publications and/or conference presentations as well as forming part of the empirical data to be used as part of a doctoral thesis.

We do not anticipate any negative outcomes from participating in this study. This study has obtained ethical approval from the UCC Social Research Ethics Committee. If you have any queries about this research, you can contact me at my university email or via my mobile phone number: AlanShanahan@umail.ucc.ie, (+353-87-2836347)

Q2 I have read the consent requirements and agree to participate in Round2 of the study

- ○ I agree to participate (1)

End of Block: Introduction

Start of Block: Demographics

Q3 Please select the industry sector that best describes the industry you work in

- ○ Pharma Production and Preparation (1)
- ○ Medical Products & Instruments (2)
- ○ Food Products (3)
- ○ Electrical Equipment (4)
- ○ Chemical Products (5)
- ○ Consulting (6)
- ○ Other (7)

Q4 If you selected 'Other' the please specify:

_____

Q5 How many separate companies have you experienced the S&OP/IBP process with?

- ○ One Company (1)
- ○ Two Companies (2)
- ○ Three Companies (3)
- ○ Four Companies (4)
- ○ Five or more Companies (5)

Q6 Please select the role/perspective that you are answering the subsequent questions on behalf of:

- ○ Process Facilitator (1)
- ○ Review Decision Maker (2)
- ○ Educator / Consultant (3)

End of Block: Demographics

Start of Block: Strategic Alignment Challenges

Q7 This section explores some of themes that emerged from Round 1 about what you perceive when companies struggle to achieve Strategic Alignment (SA) in S&OP/IBP

Q8 It is perceived that the lack of a visible and executable strategy is a key impact when companies struggle to achieve SA. Please indicate the importance of the listed elements to be in place to address this:

	Nice to Have (1)	Good to Have (2)	Essential (3)
Vision, Mission, Strategic Objectives clearly visible (1)	○	○	○
Strategic Roadmaps showing top down expectations for each year of the strategic plan (2)	○	○	○
Strategic targets defined by year and not just overall (3)	○	○	○
Strategic Plan that is challenging but achievable (4)	○	○	○

Q9 Are there other aspects that you deem important to ensure a visible and executable strategy is available to support SA? Please specify

_____

_____

_____

_____

_____

Q10 The imperative of addressing short-term issues comes across as a prominent reason for not focusing on SA. Please indicate which of the following approaches is the best way to address this

- ○ Have a separate but linked process for managing the 0-3M horizon (1)
- ○ Allocate a defined amount of time in the S&OP/IBP reviews for discussing the 0-3M issues (2)
- ○ Both - linked process but also discuss in reviews (3)

Q11 Do you believe it is practical to structure incentives to encourage the focus on Strategic Alignment (SA) in S&OP/IBP?

- ○ Yes (1)
- ○ No (2)

Q12 Please give reasons for your answer

_____

_____

_____

_____

_____

End of Block: Strategic Alignment Challenges

Start of Block: Conceptual Framework

Q13 This section explores further the feedback received from Round 1 with respect to the conceptual framework interpreted from the literature to date. A link to this framework is provided below for your reference.

Q14 Click to write the question text

Q15 The focus on education came across as a very prominent theme from Round 1. Can you please indicate whom the up front S&OP/IBP education should be addressed to. Tick all that you see appropriate

- ☐ Executive Team (1)
- ☐ S&OP/IBP Team who will design the process (2)
- ☐ S&OP/IBP Team who will run the process (3)
- ☐ Management across the business (4)
- ☐ All employees (5)

Q16 The topic of Maturity provided differing perspectives. Please indicate your view against each of the following statements:

Q17 Before embarking on S&OP/IBP journey one has to understand the current level of maturity of the organisation

- ○ Strongly disagree (1)
- ○ Somewhat disagree (2)
- ○ Neither agree nor disagree (3)
- ○ Somewhat agree (4)
- ○ Strongly agree (5)

Q18 To achieve Strategic Alignment (SA), the S&OP/IBP process will have to reach a level of maturity

- ○ Strongly disagree (1)
- ○ Somewhat disagree (2)
- ○ Neither agree nor disagree (3)
- ○ Somewhat agree (4)
- ○ Strongly agree (5)

Q19 In your experience how many S&OP/IBP monthly cycles are required before the process is mature enough to engage SA type discussions?

- ○ 3M (1)
- ○ 6M (2)
- ○ 12M (3)
- ○ 18M (4)
- ○ 24M (5)
- ○ > 24M (6)

Q20 Revisiting the proposed conditions for 'SA in S&OP'/IBP please rate each condition:

	Nice to have (1)	Good to have (2)	Essential (3)
Assess maturity (1)	○	○	○
Conduct Education (2)	○	○	○
Understand business context (3)	○	○	○
Position longer-term horizon (4)	○	○	○

Q21 Do you believe that having a visible and executable strategic plan should be called out as a condition for 'SA in S&OP'/IBP

- ○ Yes (1)
- ○ No (2)

Q22 If you answered Yes to previous question, how important do you see it to have a visible and executable strategic plan as a condition for 'SA in S&OP'/IBP?

- ○ Good to have (6)
- ○ Essential (7)

Q23 Considering the feedback loop from the SA processes back to the conditions, which conditions in particular do you think would be re-visited as part of the feedback process. Tick any that you deem relevant.

- ☐ Assess maturity (1)
- ☐ Conduct education (2)
- ☐ Understand business context (3)
- ☐ Position longer-term horizon (4)
- ☐ Have a visible and executable strategic plan (5)

Q24 The following questions explore some novel elements put forward from Round 1 when asked how to build an organisation mindset for 'SA in S&OP'/IBP. Please provide your perspective on the following statements.

Q25 If the lead-time associated with a longer-term decision was made clear and explicit in the S&OP/IBP Reviews that would enhance the opportunity for SA.

- ○ Strongly disagree (1)
- ○ Somewhat disagree (2)
- ○ Neither agree nor disagree (3)
- ○ Somewhat agree (4)
- ○ Strongly agree (5)

Q26 The Decision Maker in the reviews has to have confidence that the right S&OP/IBP team is in place, if SA is to be achieved

- ○ Strongly disagree (1)
- ○ Somewhat disagree (2)
- ○ Neither agree nor disagree (3)
- ○ Somewhat agree (4)
- ○ Strongly agree (5)

Q27 Without clearly defined roles and responsibilities in the S&OP/IBP process, it will be very difficult to achieve SA

- ○ Strongly disagree (1)
- ○ Somewhat disagree (2)
- ○ Neither agree nor disagree (3)
- ○ Somewhat agree (4)
- ○ Strongly agree (5)

End of Block: Conceptual Framework

Start of Block: Updates to CF

Q28 This section explores other potential updates to the current conceptual framework for ‘SA in S&OP’/IBP

Q29 Financial integration is implied in the conceptual framework under "Integrated Planning. However it was explicitly mentioned many times in the Round 1 feedback. Do you believe that financial integration should be explicitly called out in the conceptual framework?

- ○ Yes (1)
- ○ No (2)

Q30 Please provide your perspective of what 'Financial Integration' means from your experience

_____

_____

_____

_____

_____

Q31 Strategic Assumptions emerged as an enabler to SA as part of Round 1 analysis. Please provide your perspective to the following statement.

Q32 Explicitly stated strategic assumptions provide a practical mechanism for triggering SA discussions in S&OP/IBP

- ○ Strongly disagree (1)
- ○ Somewhat disagree (2)
- ○ Neither agree nor disagree (3)
- ○ Somewhat agree (4)
- ○ Strongly agree (5)

Q33 A perspective was provided that tracking of Strategic Projects can support 'SA in S&OP'/IBP. Please provide your perspective on this topic.

Q34 The tracking of Strategic Projects should be conducted in:

- ○ S&OP/IBP Reviews (1)
- ○ Separate Strategic Management Review (SMR) (2)
- ○ Neither S&OP/IBP or SMR (3)
- ○ Both in S&OP/IBP + SMR (4)

Q35 If you believe that Strategic Projects should be tracked in S&OP/IBP, how important is it as an enabler to achieving SA?

- ○ Nice to have (1)
- ○ Good to have (2)
- ○ Essential (3)

End of Block: Updates to CF

Start of Block: Role of SW Tools

Q36 This final section looks at the role of software tools in support of Strategic Alignment (SA) in S&OP/IBP

Q37 Please rank in order of importance for using software tools to support 'SA in S&OP'/IBP (1 being most important, 8 being least important)

_____ To free up time for the S&OP Facilitators to focus on analysis versus data collection (1)
_____ To provide effective visualisation of the information (2)
_____ To enable good root cause analysis to be efficiently conducted (3)
_____ To provide a predicted view of the business performance (4)
_____ To enable automation of the strategic decision (5)
_____ To augment strategic decisions for the decision maker (6)
_____ To model the business allowing for selective scenario planning (7)
_____ To enable real-time analysis to be conducted in the S&OP/IBP Reviews (8)

Q38 Other reason for using software tools not listed above? Please specify and give it a 1-8 rank in terms of importance

_____

_____

_____

_____

_____

Q39 Decision Makers trust the use of decision support software when it comes to enabling Strategic Alignment (SA) in S&OP/IBP

- ○ Strongly disagree (1)
- ○ Somewhat disagree (2)
- ○ Neither agree nor disagree (3)
- ○ Somewhat agree (4)
- ○ Strongly agree (5)

Q40 From what you see going forward will the role of software be more or less important when it comes to enabling 'SA in S&OP'/IBP?

- ○ Less important (1)
- ○ About the same (2)
- ○ More important (3)

Q41 Please give reasons for your answer

_____

_____

_____

_____

_____

End of Block: Role of SW Tools

Start of Block: Wrap-Up

Q42 As a final wrap-up is there anything that you would like to add as it relates to Strategic Alignment (SA) in S&OP/IBP, that has not been prompted by the questions thus far?

_____

_____

_____

_____

_____

Q43 That concludes the survey for Round 2. If you are happy with your submission then please click the forward button to conclude. Note that once the forward button is engaged then the survey will automatically close and no further input will be possible.

End of Block: Wrap-Up

Appendix 4.4: Delphi Survey Round 3

Delphi Round 3

Start of Block: Introduction

Q1
Understanding Strategic Alignment in S&OP / IBP

Thank you for participating in this research project. Your contributions from Round 1 and Round 2 were very informative and a high level summary which has informed Round 3 has been supplied in the supporting document.

Participation in this study is completely voluntary. There is no obligation to participate, and should you choose to do so you can refuse to answer specific questions, or decide to withdraw from the study prior to completing the survey. All information you provide will be confidential and your anonymity will be protected throughout the study. IP addresses will not be collected at any point, meaning the data you provide cannot be traced back to you.

You maintain the right to withdraw from the study at any stage up to the point of data submission. At this point, your data will be collated with that of other participants and can no longer be retracted. The anonymous data will be stored on a University College Cork supported cloud storage platform - Microsoft One Drive. The data will be stored for minimum of ten years, in line with research code of conduct requirements at the university.

The information you provide may contribute to research publications and/or conference presentations as well as forming part of the empirical data to be used as part of a doctoral thesis. We do not anticipate any negative outcomes from participating in this study. This study has obtained ethical approval from the UCC Social Research Ethics Committee. If you have any queries about this research, you can contact me at my university email or via my mobile phone number: AlanShanahan@umail.ucc.ie, (+353-87-2836347)

Q2 Having read the consent requirements do you agree to participate in this survey?

- ☐ Yes, I agree to participate (1)
- ☐ No, I would prefer not to participate (2)

End of Block: Introduction

Start of Block: Control Questions

Q3 Please select the industry sector that best describes the industry you work in

- ○ Pharma Production & Preparation (1)
- ○ Medical Products & Instruments (2)
- ○ Food Products (3)
- ○ Electrical Equipment (4)
- ○ Consulting (5)
- ○ Medical & Pharma Products (6)
- ○ Consumer Goods (7)

Q4 Please select the role/perspective that you are answering the subsequent questions on behalf of:

- ○ Process Facilitator (1)
- ○ Review Decision Maker (2)
- ○ Educator / Consultant (3)

Q5 From your experience how many examples have you witnessed where Strategic Alignment (SA) was working well in S&OP/IBP?

- ○ None (1)
- ○ One (2)
- ○ Two (3)
- ○ Three (4)
- ○ Four (5)
- ○ 5 or more (6)

End of Block: Control Questions

Start of Block: Revised Conceptual Framework

Q6 Below is a link to the supporting document that explains the changes that have been made to the Conceptual Framework (CF) based on the inputs received in Rounds 1 and 2. Please review this document before answering the subsequent questions. Please keep in the mind the focus is not on implementing S&OP/IBP as an overall process - the focus is specifically related to Strategic Alignment (SA) within S&OP/IBP.

Q7 Click to write the question text

Q8 The revised Conceptual Framework is an accurate reflection of the key aspects involved in achieving Strategic Alignment (SA) in S&OP/IBP

- ○ Strongly disagree (1)
- ○ Somewhat disagree (2)
- ○ Neither agree nor disagree (3)
- ○ Somewhat agree (4)
- ○ Strongly agree (5)

Q9 Please specify if there are other aspects that are missing (even if highlighted in the past) that you strongly believe are significant enough to be called out in the Conceptual Framework (CF)?

_____

_____

_____

_____

_____

End of Block: Revised Conceptual Framework

Start of Block: Other areas to explore

Q10 The best way to quantifiably measure whether Strategic Alignment is being achieved within the S&OP/IBP process is by (Please pick 1):

- ○ Tracking the time spent in the review on long-term versus short-term issues (1)
- ○ Tracking the number of strategic (long-term horizon) decisions that are actually made (2)
- ○ Tracking the number of Strategic Plan challenges that are escalated from the Reviews (3)
- ○ Tracking the number of times the strategic assumptions are changed (4)
- ○ Other (5)

Q11 If you selected 'Other" then please specify:

_____

_____

_____

_____

_____

Q12 From Round 2 the perspectives on how long it typically takes to achieve 'SA in S&OP'/IBP ranged from 6-18months with 12 months being most peoples experience and one being as low as 3 months with one being as high as >24months. To help understand the spectrum of responses please answer the following question:

Q13 In your opinion what factors influence whether SA is achieved sooner rather than later?

_____

_____

_____

_____

_____

Q15 From Round 2 there was general agreement that a level of maturity of the S&OP/IBP process is required in order to achieve SA. With this understanding please provide your opinion on the following statement:

Q16 If SA is not being achieved, it would be important to assess the maturity of the S&OP/IBP process to identify what actions need to be taken

- ○ Strongly disagree (1)
- ○ Somewhat disagree (2)
- ○ Neither agree nor disagree (3)
- ○ Somewhat agree (4)
- ○ Strongly agree (5)

Q17 Please provide the reason for your answer:

_____

_____

_____

_____

_____

Q18 From Round 2 many experts clearly have experience of Strategic Management Reviews (SMRs). Please provide your perspective on the following statements

Q19 Strategic Management Reviews are linked to S&OP/IBP process because typically the same leadership team attends both.

- ○ Strongly disagree (1)
- ○ Somewhat disagree (2)
- ○ Neither agree nor disagree (3)
- ○ Somewhat agree (4)
- ○ Strongly agree (5)

Q20 Typically a Strategic Management Review would be conducted:

- ○ Weekly (1)
- ○ Monthly (2)
- ○ Quarterly (3)
- ○ Annually (4)
- ○ Every 2 years + (5)

Q21 Thank you again for your time and support to this research project. If you are happy with your responses then click onto the next page at which point the survey will close and your responses will be recorded. A full report will be issued to you following the final analysis.

End of Block: Other areas to explore

Appendix 4.5: Interim Report to Expert Panel in support of Round 3

Enabling Strategic Alignment(SA) in S&OP/IBP - Field Research Delphi Study Round 3

To date the feedback from the panel of experts has provided rich content to the study. This content has been positioned into three main areas:

1. Feedback that has influenced changes to the original conceptual framework.
2. Feedback that has helped explain what sits behind the elements within the conceptual framework.
3. Related feedback to the topic that could be pursued at a later time.

With the understanding that this third round will be the final round of the Delphi study, the focus is on item 1 above in particular with some specific follow-ups on item 2.

Changes to the Conceptual Framework (CF)

Based on the collective and aligned perspectives of the expert panel the conceptual framework has evolved. For your reference the original CF is shown in Figure 1 and the current revised version in Figure 2.

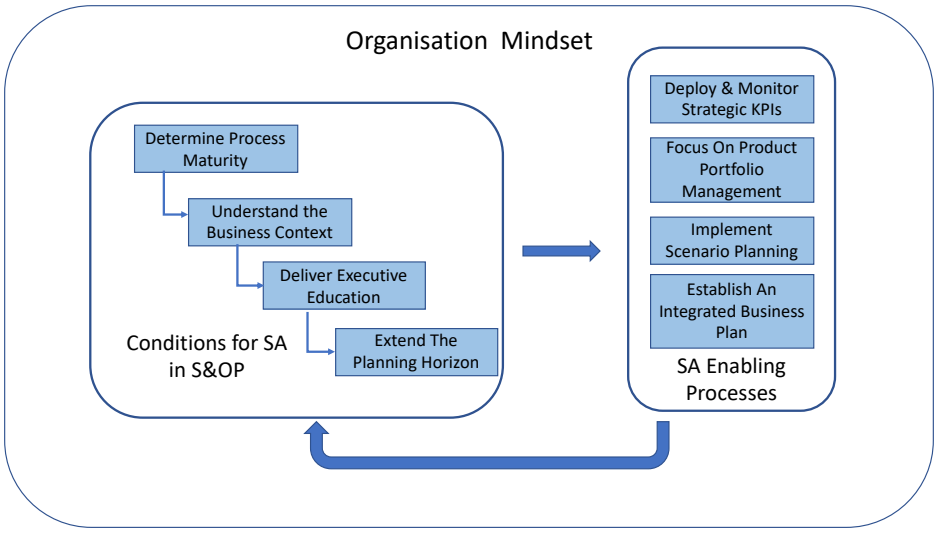


Figure 1: Conceptual Framework of SA in S&OP/IBP

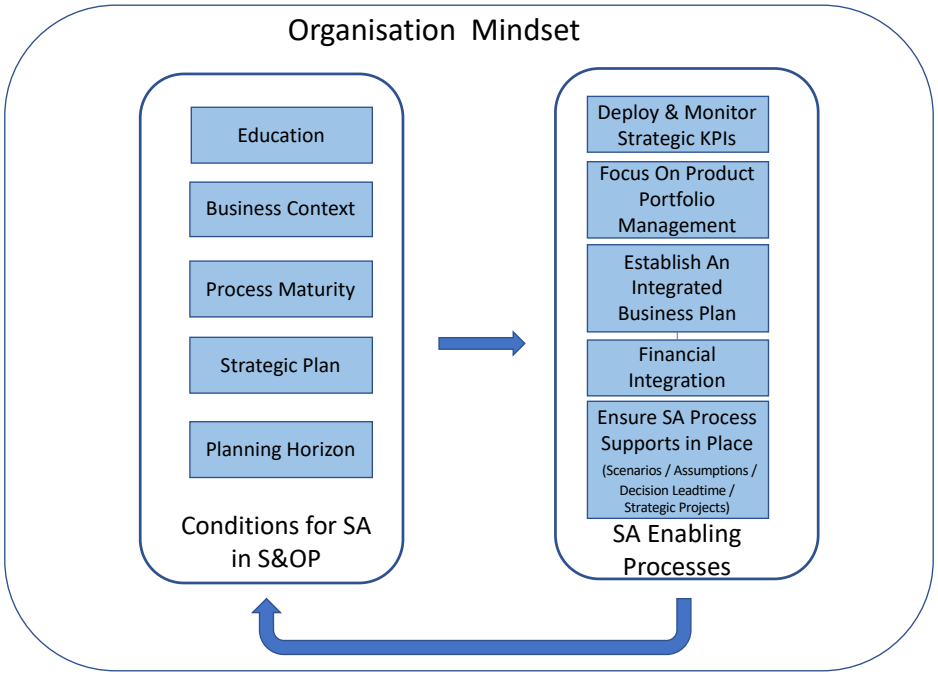


Figure 2: Revised Conceptual Framework of SA in S&OP/IBP

The following key changes have been made based on the feedback to date:

- The sequencing of the conditions has been removed.
- The verbs in front of the conditions has been removed to reflect the elements as being variables that are influenced by the feedback process.
- The condition of having a visible and executable "Strategic Plan" has been added to the conditions.
- The "Executive Education" condition has been changed to "Education" to reflect the requirement for a broader education requirement across those who are involved in the S&OP/IBP process design and implementation.
- "Financial Integration" has been added as an explicit process for SA and linked directly to the requirement to "Establish an Integrated Plan".
- "Scenario Planning" as a specific support process has been expanded to bring in other key support processes highlighted by expert panel as part of the study.

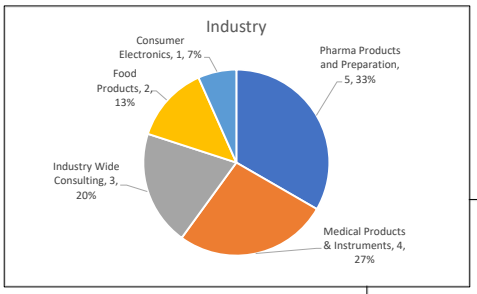
In this survey round you will be asked for your view of whether this framework now reflects the main areas of focus for enabling SA in S&OP/IBP, based on your experience.

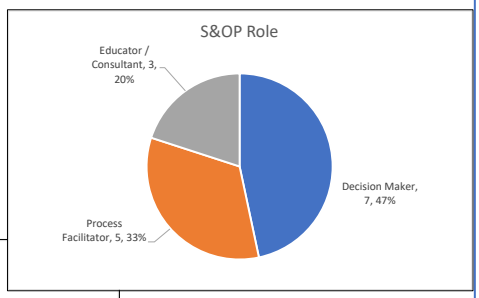
Supporting Information from Round 2

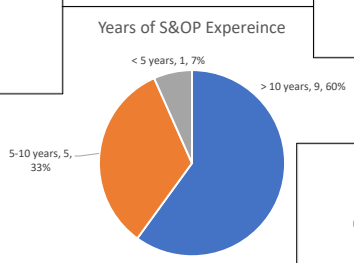
In support of these changes as they relate to the CF plus the specific areas to be explored in Round 3, the following charts are provided for your reference.

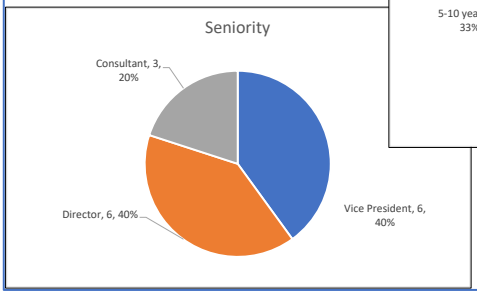
Appendix 4.6: Analysis Charts from Delphi Round 1

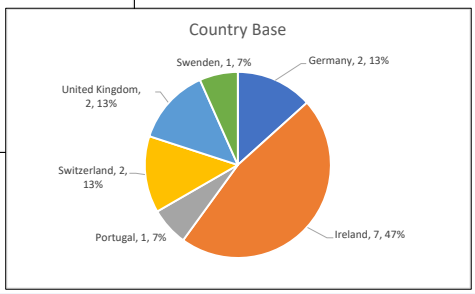
Demographics Summary (Q1-Q4)



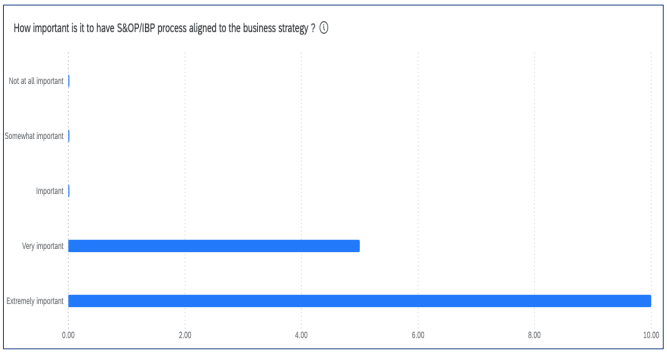




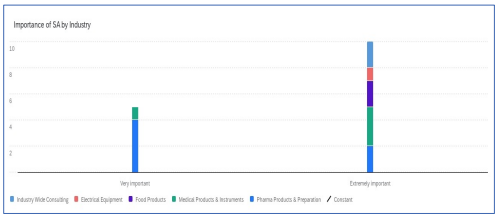




How important to have S&OP aligned to Business Strategy (Q6) ?



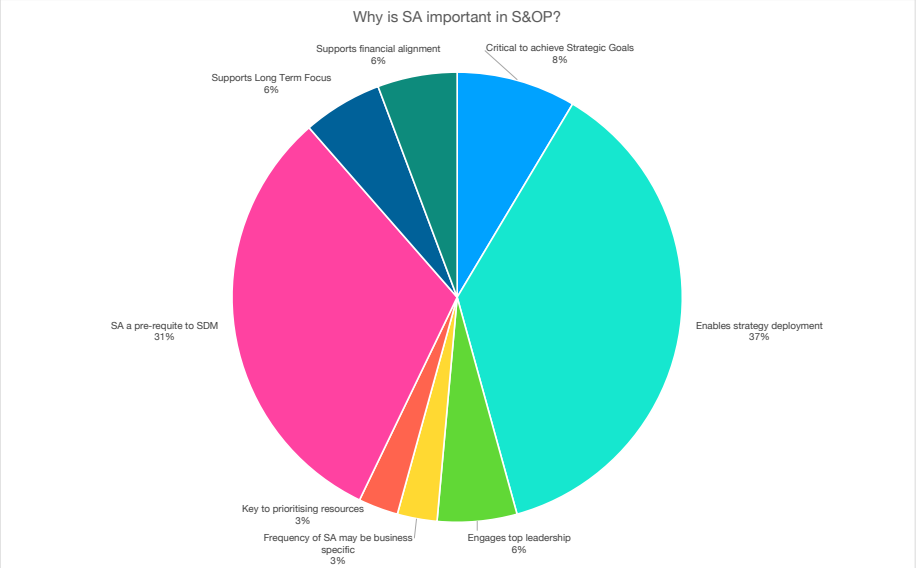




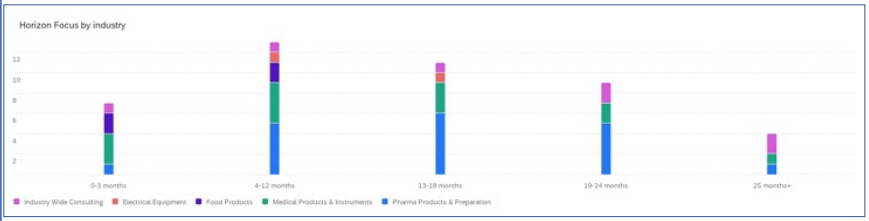
Overall positive perspective that it is important to have S&OP process aligned to Strategy.

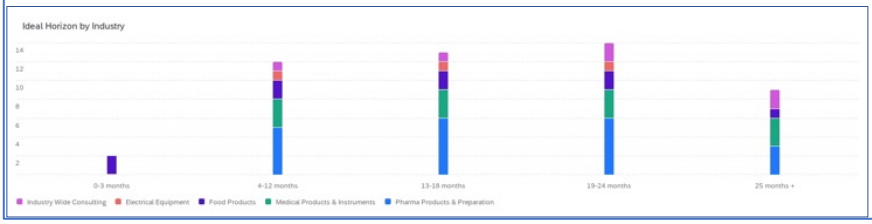
No specific observations to be noted by role or industry.

Reasons why S&OP needs to be aligned to Business Strategy (Q6a) ?



Horizon Focus in S&OP in practice (Q7) + where focus should be (Q8)

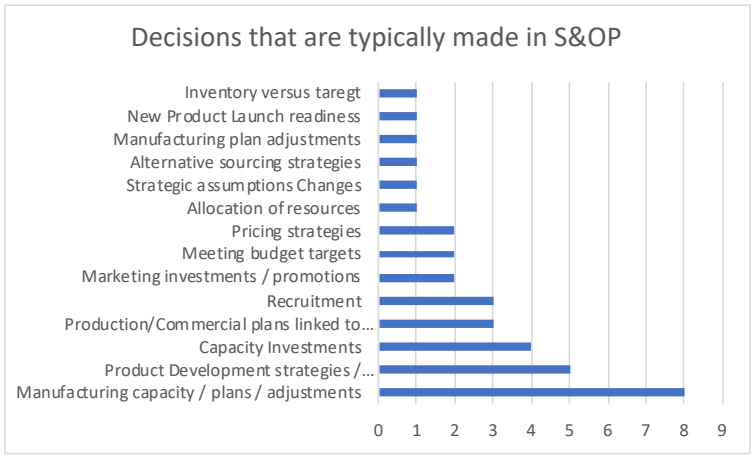


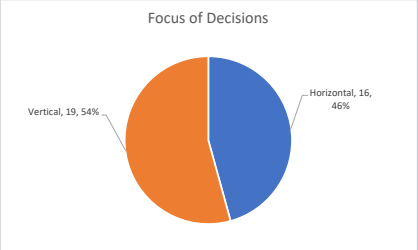


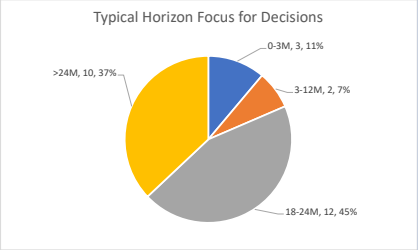
Key Observation

- In practice organisations focus on the 0-3M as part of their S&OP process.
- Shift in horizon focus shows belief that S&OP should be focused on the longer term horizon.
- One industry sector (Food) believe 0-3M should be a focus in the S&OP process whereas all other industry sectors do not. Likely driven by commodity pricing focus in those 2 x respondents.

Q7a: Examples of types of decisions that experts typically see being made in their S&OP/IBP meetings (N=35 references across 15 respondents)

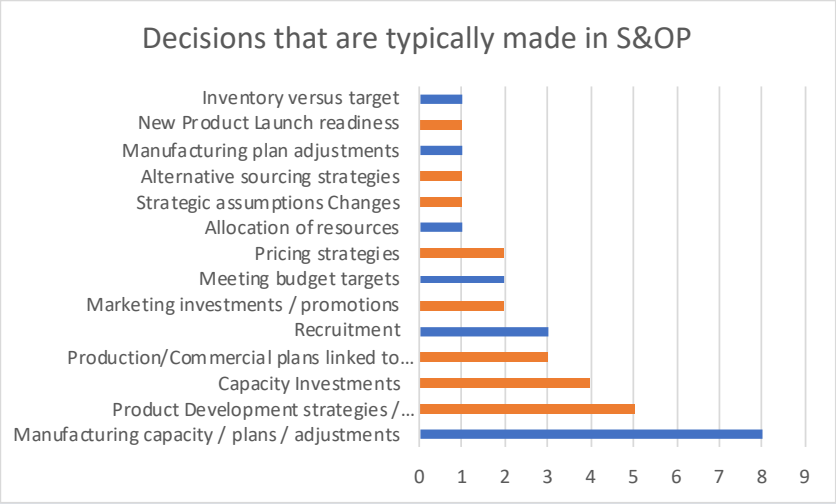






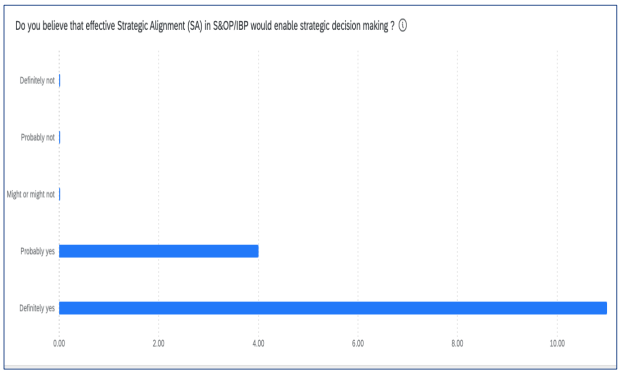
From Data Analysis Excel file – not from NVIVO

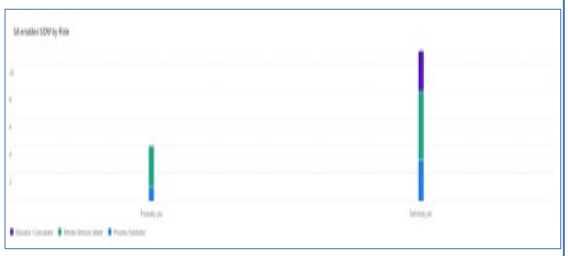
Types of Decisions (Q7a)

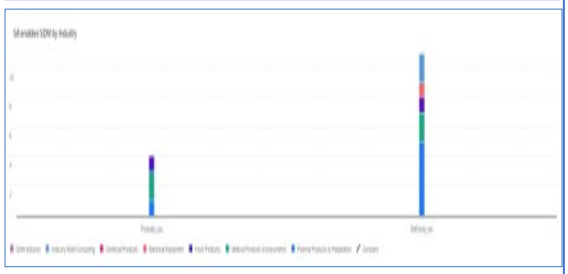


SA required

Do experts believe that SA supports SDM (Q9)?



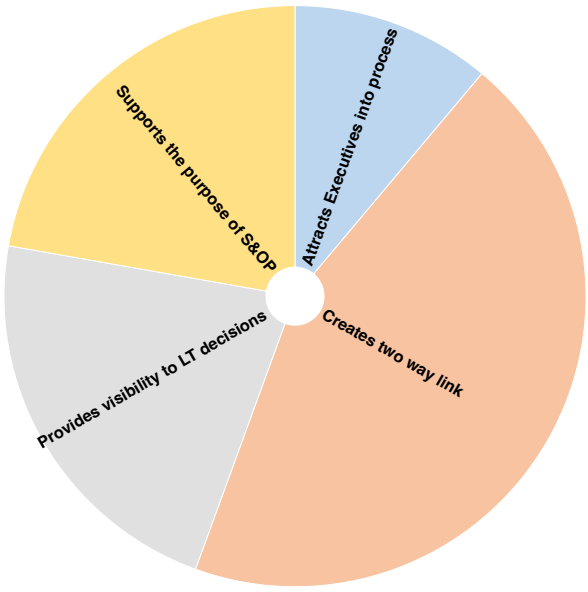




Overall positive perspective that achieving SA would support enablement of SDM in S&OP.

No specific observations to be noted by role or industry.

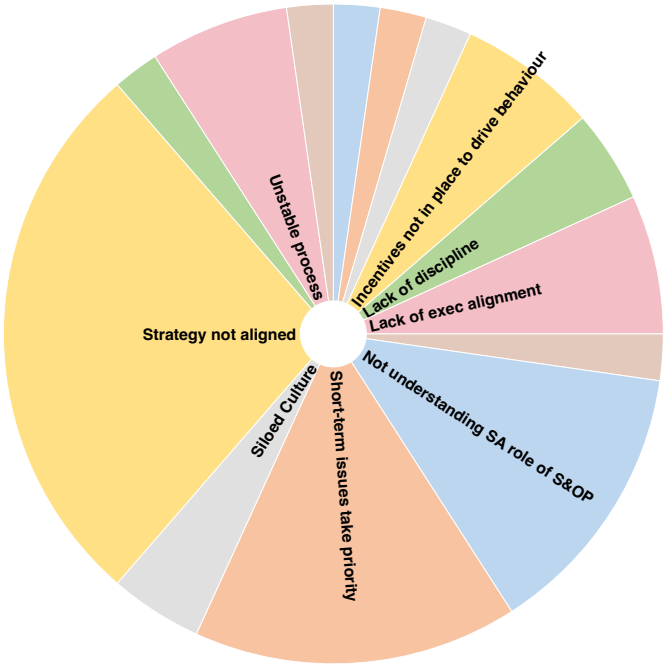
Why experts believe that SA supports SDM (Q9a)



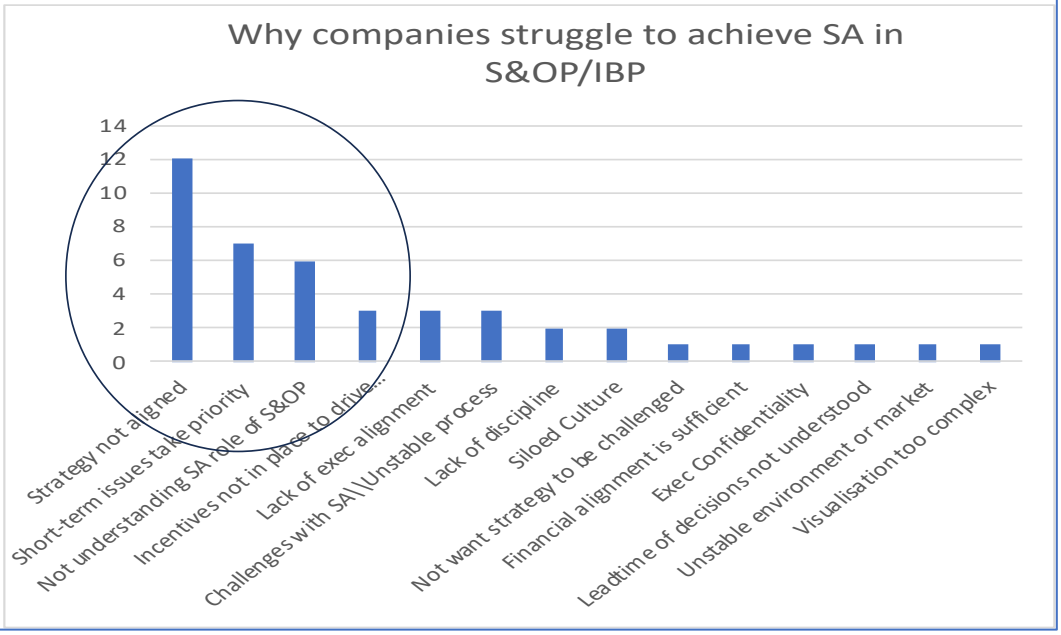
Reasons why companies struggle with SA in S&OP in practice (Q10)

Implications for Round 2 Delphi

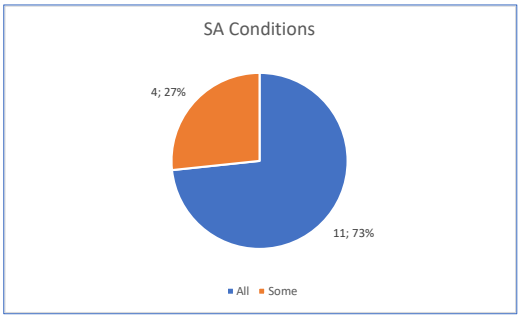
- Explore what meant by having an aligned strategy / strategic plan – Novel insight not in current CF
- Get perspective on how to counter the pull towards short term, which impacts on SA focus?
- Explore role of incentives to drive SA behaviour?

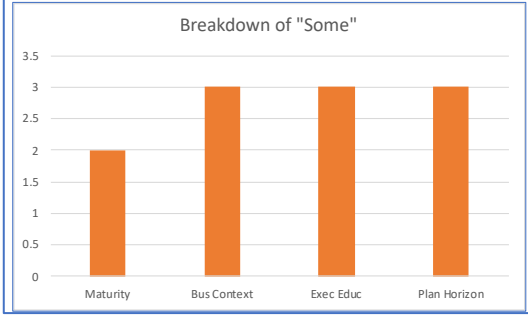


Reasons why companies struggle with SA in S&OP in practice (Q10)

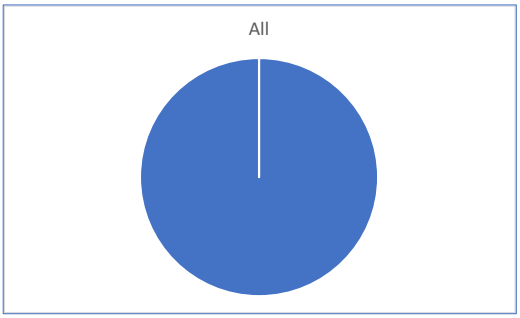


In your opinion which of the conditions listed for Strategic Alignment (SA) in S&OP are required (Q12)?





Which of the Strategic Alignment (SA) processes are relevant to achieve SA in S&OP/IBP (Q14)?

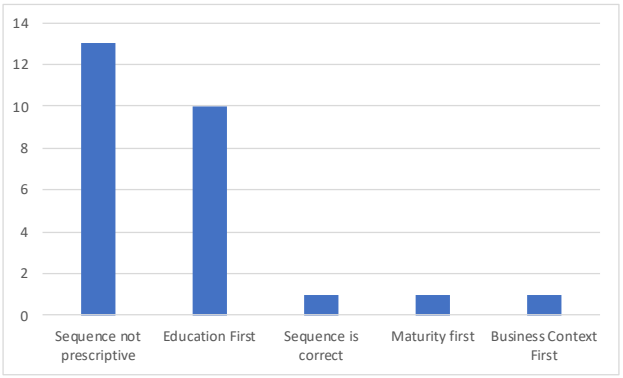


Impact to Conceptual Framework

- Explore in Round 2 whether some processes are deemed to be "essential" versus "optional" or "Good to have"?

All from industry code "Pharma"

Sequence of conditions (Q13)?

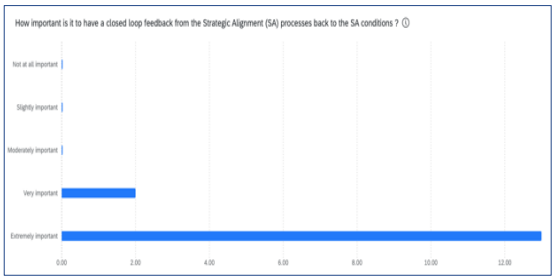


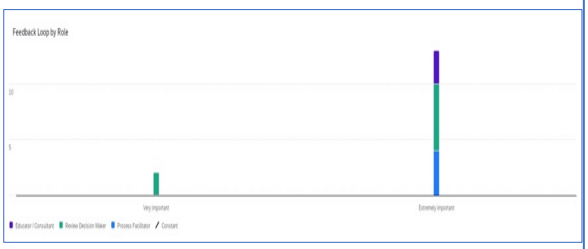
Impact to Conceptual Framework

- Remove sequence as there is no consensus on specific sequence
- Interesting that Educators did not stress that Education should come first !
- Explore in Round 2 whether some conditions are deemed to be "mandatory" versus "optional" or "Good to have"?

"The strategic process must be meaningful and aligned - i.e. Not a strategy left on the shelf but one that is revisited quarterly or enough to be meaningful for the context and environment"

Importance of Feedback Loop (Q18)?



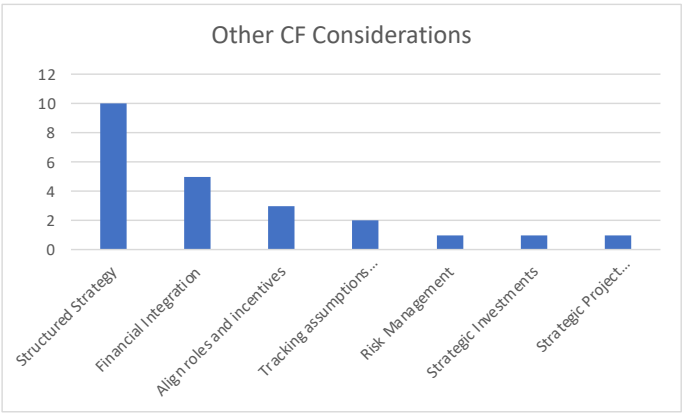




Observations

- Feedback loop as shown in CF deemed to be important
- 2 x Decision Makers viewed it as important versus very important.
- No insights of note in terms of role or industry splits.

Other CF Considerations (Q14 & Q16)

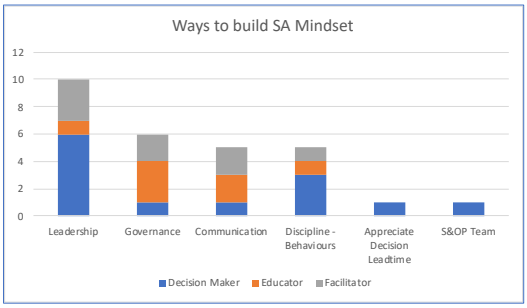


Impact to Conceptual Framework

- Structured Strategy is Novel versus LR
- Financial integration is embedded in Integrated Planning – should it be more visible in the model?
- Roles and incentives – explore more in Round 2?
- Strategic assumptions – explore more in Round 2?
- Similarly for Risk Management and Strategic Projects – Round 2?

Building SA Mindset (Q19)



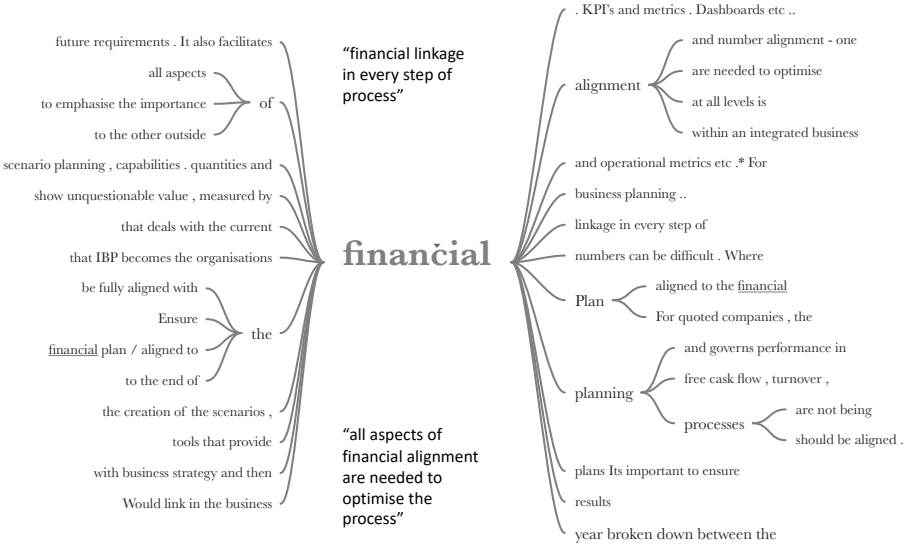


NVIVO: Delphi Process/NVIVO Masters/Delphi Wave1.nvpx

Impact to Conceptual Framework

- No impact to CF structure
- Could explore further in Round 2 Delphi to determine the more important aspects behind Culture & Leadership?
- Leadtime and S&OP team came from Decision Maker – could be a key to how they see enabling SDM through SA?

Word Tree – "Financial"

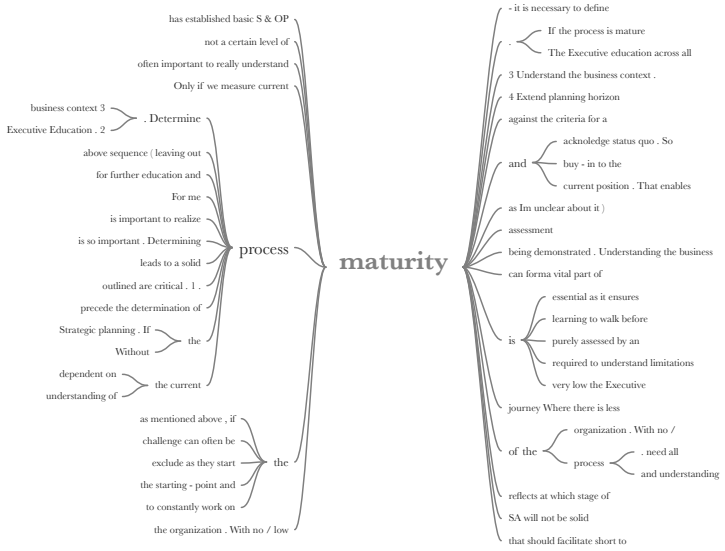


"financial linkage in every step of process"

"all aspects of financial alignment are needed to optimise the process"

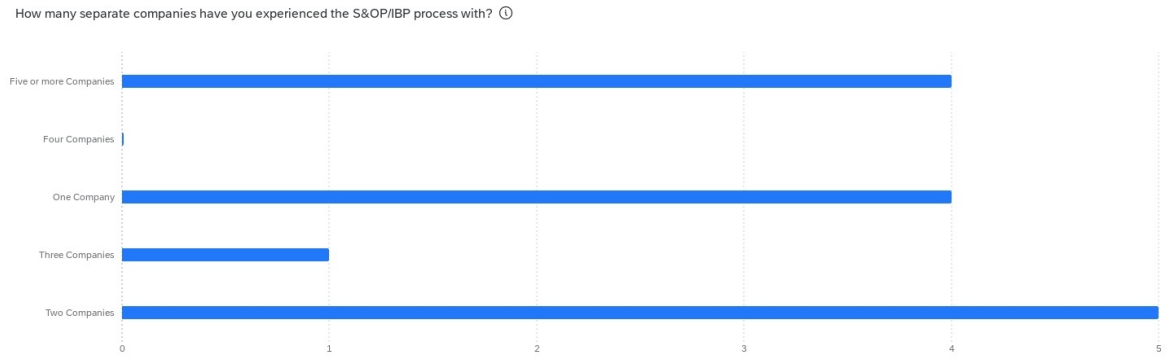
Word Tree – “Maturity”

“Without the process maturity SA will not be solid or sustainable”.

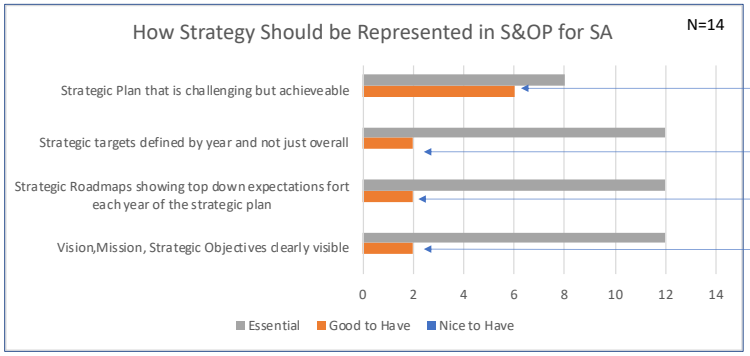


Appendix 4.7: Analysis Charts from Delphi Round 2

No. Companies where have experience S&OP



Q8: What's needed to ensure a visible and executable strategy for SA in S&OP?



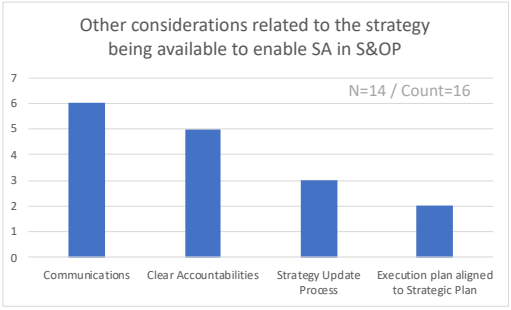
"Good to Have" Profile

Industry	Role	No. Cos
1 X Med 3 X Pharma 1 X Elec Equip 1 X Educator	4 X Dec Maker 1 X Facilitator 1 X Educator	2 X One Co. 2 X Two Cos 2 X Five+ Cos
2 X Pharma	2 X Dec Maker	2 X One Co.
1 X Med 1 X Pharma	1 X Dec Maker 1 X Facilitator	1 X One Co. 1 X Two Cos
1 X Med 1 X Pharma	1 X Dec Maker 1 X Facilitator	2 X Two Cos

Strong support as "essential" to have a structured strategy with Vision, Mission, SOs and strategic plan (SP) showing expectations by year.
Having a SP that is challenging but achievable viewed as at least good to have if not essential

CF: Add in "Strategic Plan" as a condition

Q9: Other aspects to be considered to ensure a visible and executable strategy for SA in S&OP?

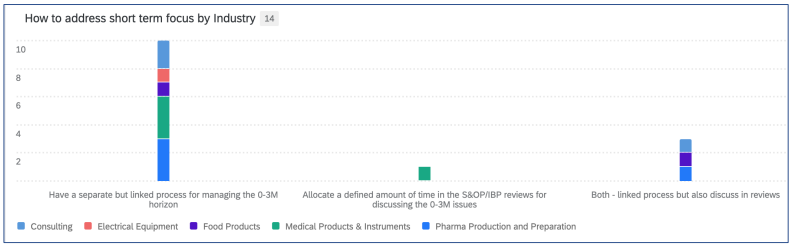


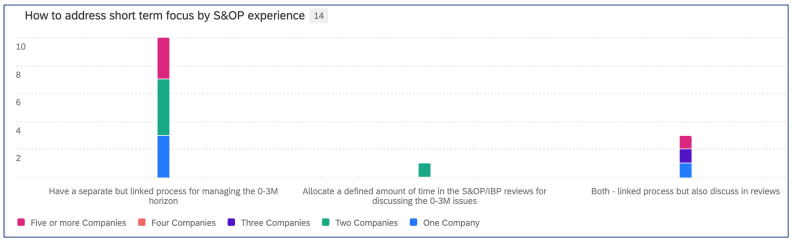
Considerations to ensure SP can be deployed successfully. Strategy update process supports the depiction of a feedback loop in the CF.



CF: Add in "Strategic Plan" as a condition – feedback loop already positioned

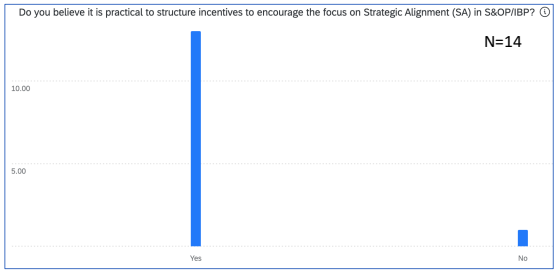
Q10: How to address challenge of short term focus?

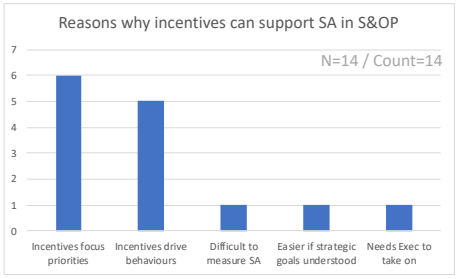




Strong consensus that need to have a separate but linked process for 0-3M focus with some perspectives that even with this, would still need to discuss in the S&OP reviews. Key approach to help achieve the longer term horizon focus called out for in the CF.

Q11&Q12: Do you believe it is practical to structure incentives to encourage the focus on SA in S&OP?





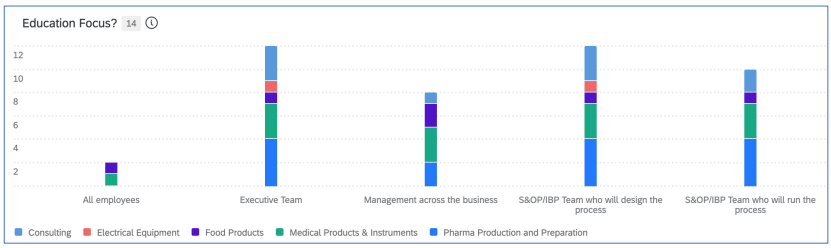


While strong consensus that incentives are practical to encourage focus on SA in S&OP, qualitative reasoning would indicate some key challenges to make this happen.

R3 – Check on how could measure SA if were to use incentives. On reflection would this change the perspective on how practical it is to use incentives?

CF: Element of achieving mindset? TBD R3

Q15: Focus of Education?



Clear agreement that need to educate the executive team and the S&OP design team. However, while slightly less, still strong view that should educate the S&OP team that will run the process and management across the business.
Not considered critical to educate all employees as a condition for SA.

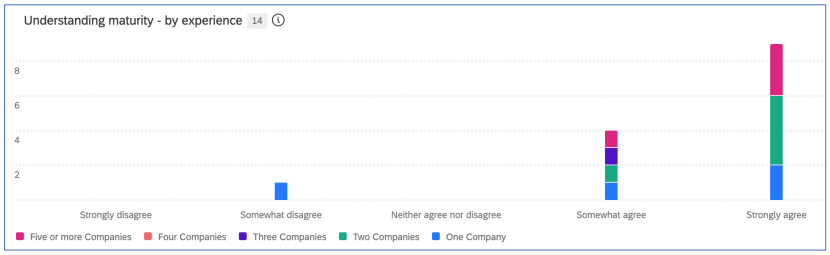


Q17: Need to understand S&OP maturity up front

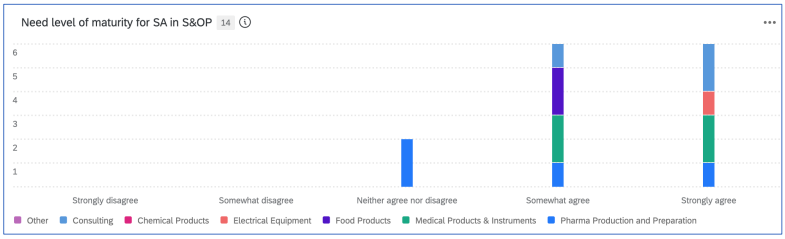


Clarified position on understanding maturity up front as a condition. Good agreement albeit at different levels.
One outlier that did not agree - Pharma / Decision Maker / One Company experience.

R3 – Explore tying in Maturity to the feedback process?

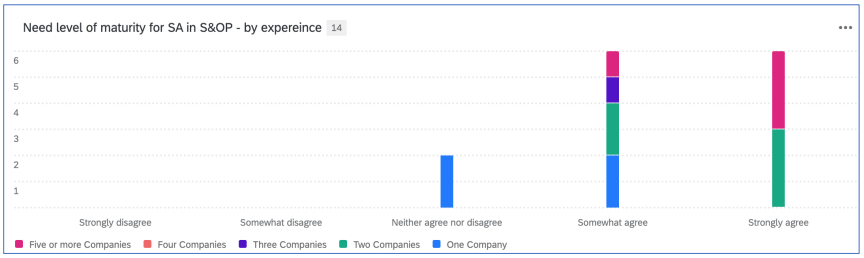


Q18: Need a level of maturity before can achieve SA in S&OP

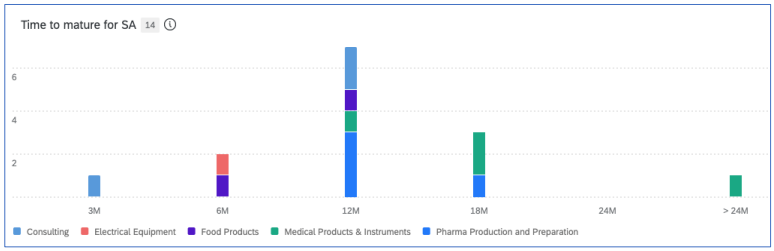


Strong agreement that in order to achieve SA there needs to be a level of maturity achieved.
Two neutral inputs again coming from Pharma / Decision Maker / One Company experience

R3 – Explore if Pharma / Decision Maker feel that SA should be achieved right from the start?
Is there a business context that would determine how quickly the process matures?

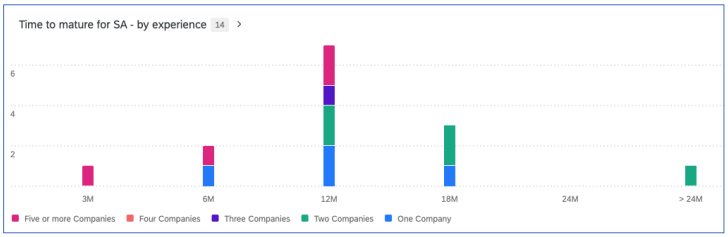


Q19: A typical S&OP process will mature to engage SA by:

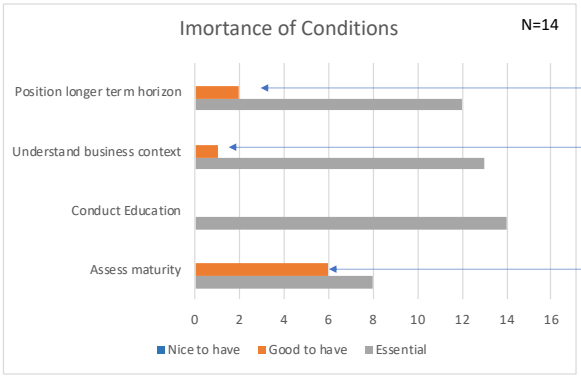


Normal distribution around 12M to achieve maturity for SA.
24M perspective from Med Device / Decision Maker / One Company – in this area maybe better to provide more weight where have experience in more than one company?

R3 – Propose that 3M and >24M feedback are outliers and suggest consensus of 12M as typical but could be as fast as 6M and as long as 18M => Window from 6-18M
Does this relate to business context?



Q20: Perspectives on importance of Conditions in CF



"Good to Have" Profile

Industry	Role	No. Cos
1 X Pharma 1 X Electrical	1 X Facilitator 1 X Dec Maker	1 X One Co. 1 X Five+ Cos
1 X Food	1 X Dec Maker	1 X One Co.
1 X Med 2 X Pharma 1 X Food 1 X Electrical 1 X Educator	1 X Facilitator 4 X Dec Maker 1 X Educator	2 X One Co. 1 X Two Cos 1 X Three Cos 2 X Five+ Cos

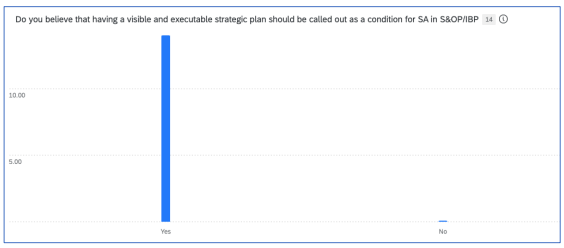
Unanimous that Education was essential.
Also strong support that the longer term horizon and business context were also essential conditions.
Assessing maturity was viewed as important but some viewed it as good to have rather than essential.

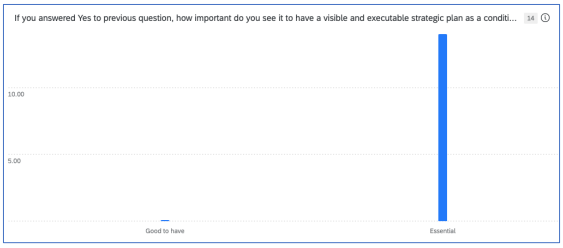
R3 – Test how "Assess Maturity" should be represented in the CF.
If believe that SA only comes with mature S&OP processes then assessing maturity has to be a condition?

No specific insights from attributes of Industry / Role / No Co. experience

CF: Remove sequence of conditions and conclude on assess maturity after R3

Q21 & Q22: Does having a visible and executable strategic plan need to be called out in the conditions and how important is it?

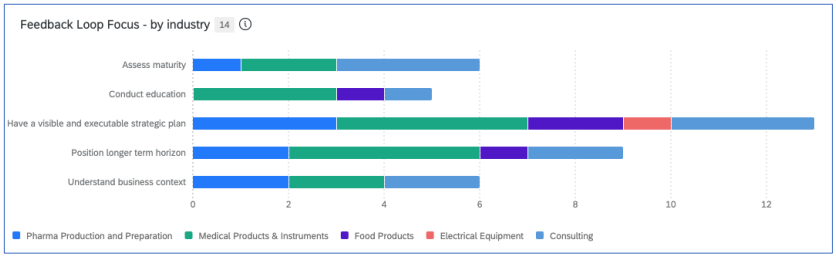




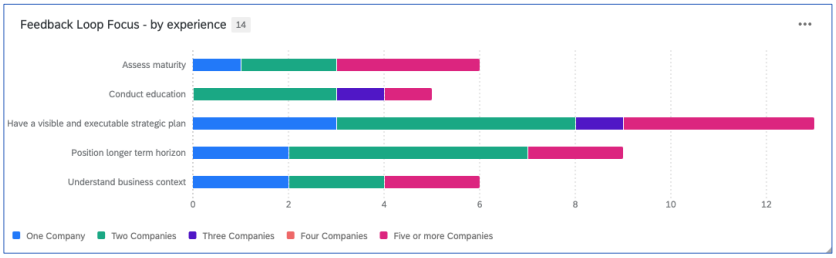
As highlighted by some of the expert panel in R1, there was unanimous consensus that having an executable plan is a key condition for SA in S&OP.

CF: Include Strategic Plan as one of the conditions.

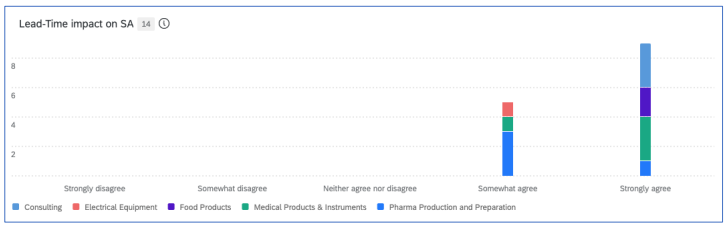
Q23: For Feedback Loop, which conditions would be re-engaged?



Experience suggests the link back to strategy as being most critical, followed by maintaining a longer term focus. This ties in with R1 feedback on impacts to SA coming from lack of SP and team being dragged into the short term issues.
Less emphasis on others could imply that typically don't have to re-assess maturity or repeat education and business context not change so often to require review for alignment.

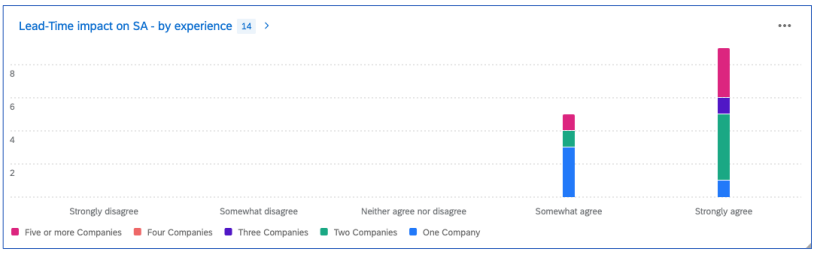


Q25: Stated lead-time for LT decision would enhance opportunity for SA?

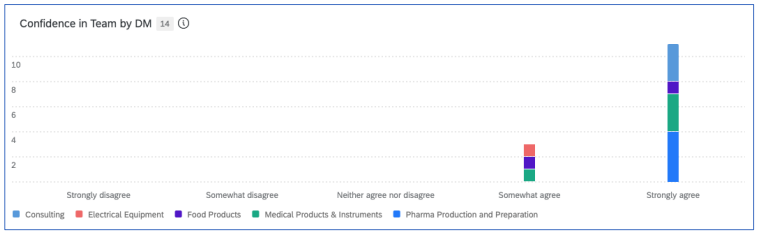


Good agreement that this novel input from R1 could make a difference in enabling SA. All consultants strongly agree as did the Food Product based experts.

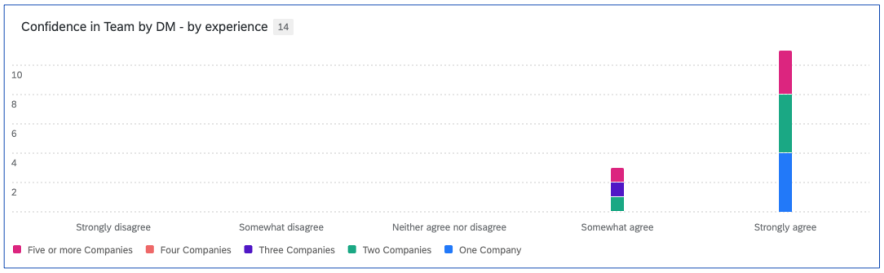
This aspect more to do with SDM as a result of SA? Or a holistic view of SA have to take in SDM as this is the whole purpose of SA? Does not mean that SA is sufficient for SDM but it is a major and essential factor. This was confirmed in R1 but maybe ensure full consensus on this topic in R3?
Ties in with way of measuring SA?



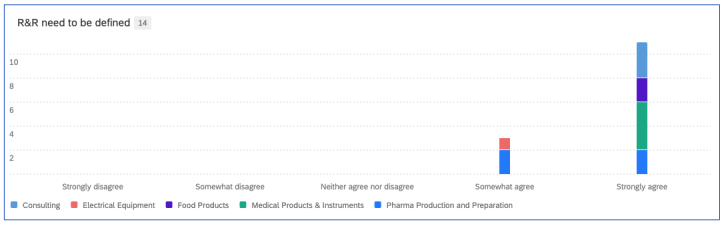
Q26: Decision Maker has to have confidence in the S&OP Team for SA?



Strong agreement in this novel element raised in R1. Could imply that even if everything is in place then SA discussions would not occur if decision maker did not trust the S&OP team.

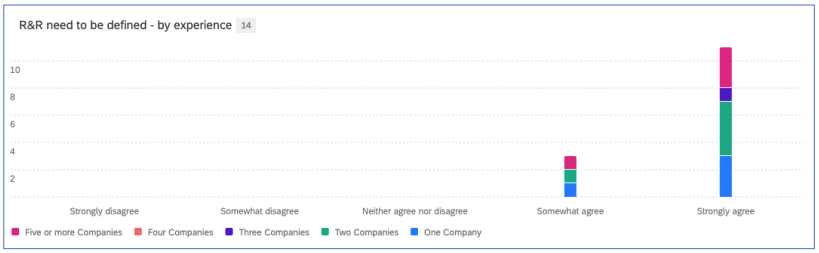


Q27: Roles & Responsibilities need to be clearly defined for SA in S&OP?

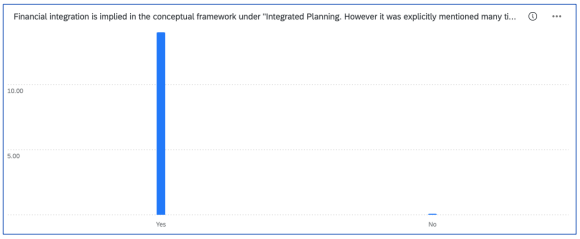


Strong agreement in this novel element raised in R1.

R3 -Could be worth exploring why this is so important, particularly as it relates to SA (as opposed to S&OP overall)?

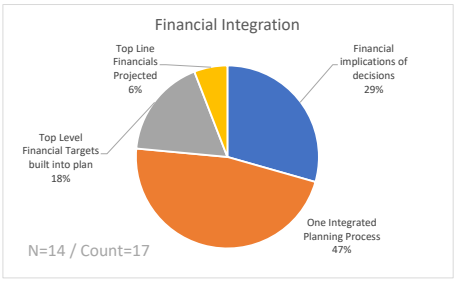


Q29 & Q30: Explicitly stating Financial Integration in the CF and what is meant by financial integration



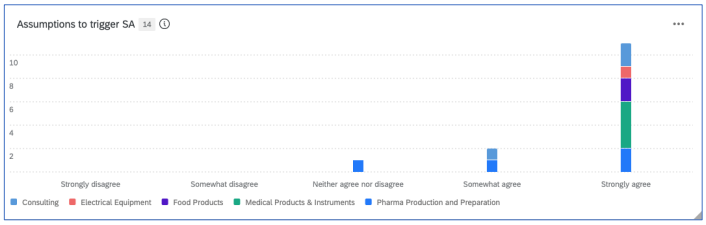
Received a lot of mentions in R1 and here indicates that there is strong consensus that it should be explicitly stated in the CF

Perspective is that financial integration means that there is one planning process and one plan – not one for financial and one for operations.

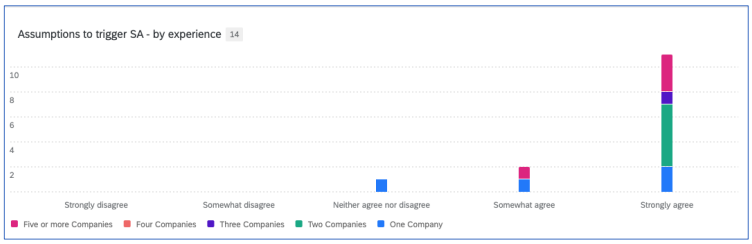


CF: N/A – Call out Financial Integration explicitly.

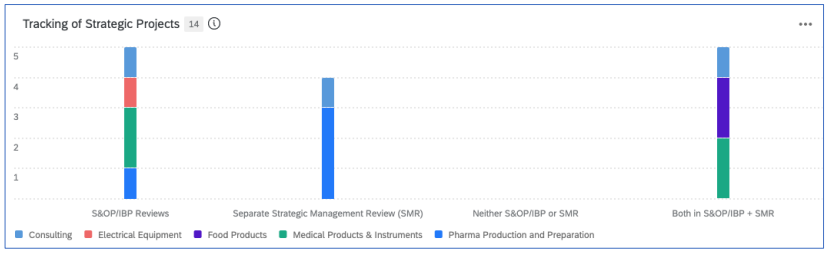
Q32: Explicitly stated strategic assumptions can trigger SA discussions



Strong consensus that assumptions can trigger SA discussions.
One neutral perspective from Pharma / Decision Maker / One Co. experience



Q34: Where should Strategic Projects be tracked?



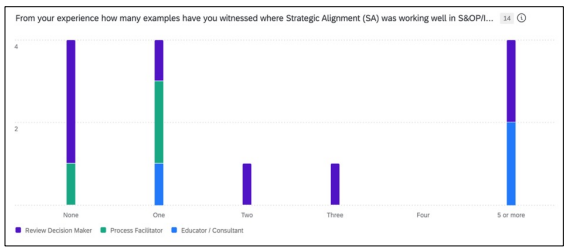
More emphasis on including strategic projects in S&OP but 4 inputs to suggest they should be tracked separately in SMR. This latter perspective from Pharma (X3) plus Consulting (X1).

R3 - Could take more explicit view to ensure understanding by asking whether SA type discussions would be impacted if strategic projects were not discussed in S&OP?



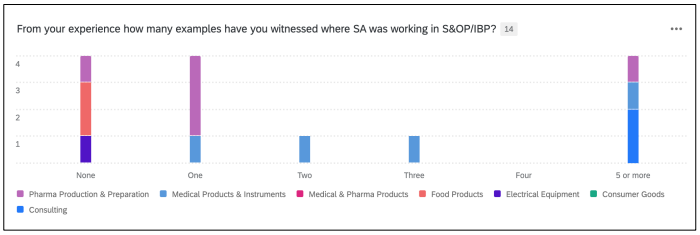
Appendix 4.8: Analysis Charts from Delphi Round 3

Q5: No. instances witnessed where SA working well in S&OP



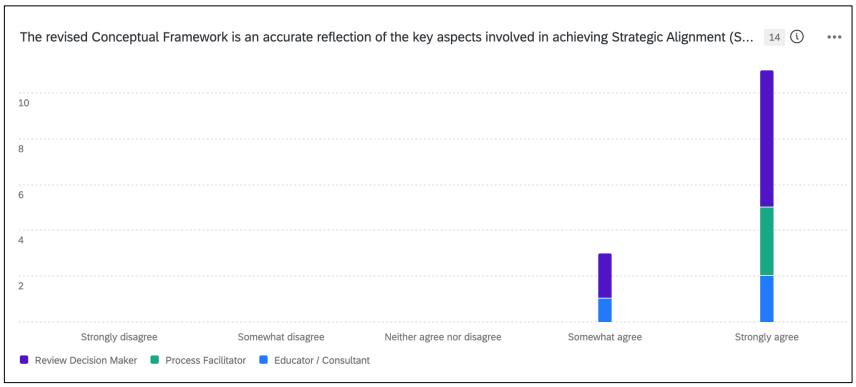
By role

4 X experts have yet to experience SA working well and a further 4 only once.
As expected the consultants have seen 5 or more.
Indicator of how difficult it is to achieve but could also just reflect number of companies worked with on S&OP.
None of food products companies have experienced it – ties in to their previous input on short term focus drivers.
Also electrical equipment (consumer products) – maybe indicate fast moving industries struggle the most?



By industry

Q8: Agree with Revised Conceptual Framework – by role?



Strong consensus on the revised CF construct and content.

Q9: Any other considerations for the CF?

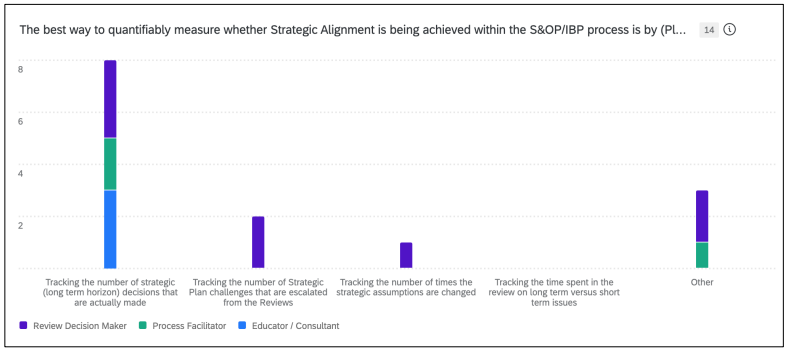
"Perhaps already covered implicitly, but my experience indicates unless there is leadership commitment and discipline to follow and adhere to the process and use it also to support decision making, the process can become formulaic and disconnected from where the 'real' decisions are taken." – DM7



Qualitative inputs reinforce the content of the revised CF.

"I believe that communication, and setting of expectation, are an important condition for SA in S&OP. What I mean is that it has to be clear, to the organisation, that having a Strategy is important to the organisation, and that the executive team expect it to be understood, and consistently used as a guiding framework throughout the business. This requires the Executive team to consistently communicate the Strategy, explain what it means to Functions, and then the Functions have to "walk the talk" by aligning with the Strategy in everything they do, including S&OP/IBP. (Note: This sentiment may be implicit within "business context" and "strategic" plan?)" – CT1

Q10: Best way to measure whether SA is achieved – by role?



Practical inputs on how to measure SA – strongest agreement on measuring number of strategic decisions made.
Good to test further in a case study.

Q11: Other ways to measure SA in S&OP/IBP?

"If you only measure 'Strategic Decisions' the number may be low and may not move some months. Looking at other decisions that align with [or don't] the strategic plan, gives you a sense if you are becoming misaligned to the overall strategic direction."

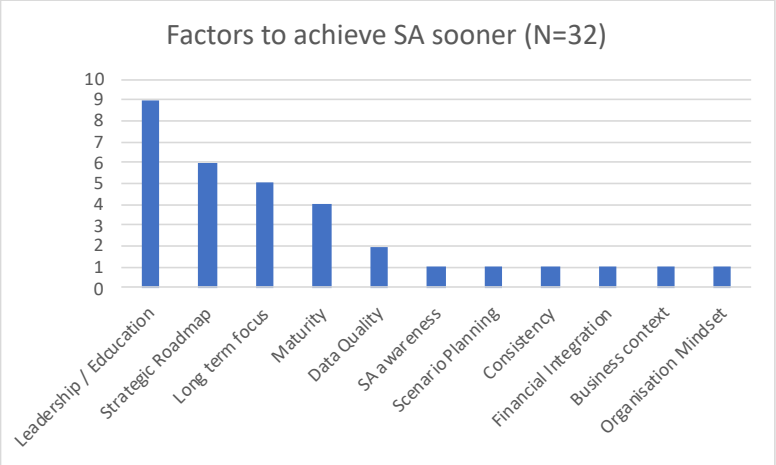
Practical inputs on how to measure SA – strongest agreement on measuring number of strategic decisions made.
Good to test further in a case study.

"Tracking No of Strategic decisions actually made and executed"

"One measure doesn't cover it adequately: Time spent on long versus short term doesn't necessarily mean its qualitative but can be a good indicator. Tracking strategic decisions is important but the one I'd give the greatest weight to is 'challenges escalated' as it strongly flags that the process is working in that deviations from process are being highlighted for discussion. However the others also contribute and perhaps a missing KPI is more qualitative - managements view on whether the process is achieving strategic alignment or are they having to go to other forums to do so."

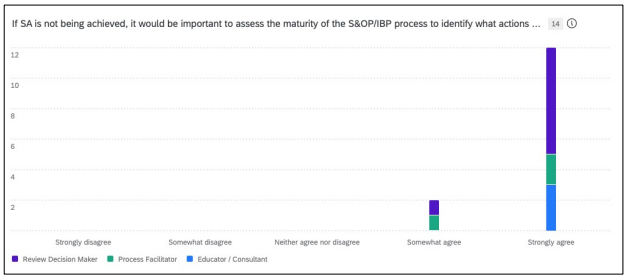
"A good way to measure whether SA is being achieved within S&OP/IBP would be a two-level approach: Level 1: Measure how many of the strategic initiatives planned in the Strategy are being pulled in the IBP process and kicked-off on time Level 2: Measure whether the strategic initiatives kicked-off are completed on time (e.g. through project milestones adherence metric) Furthermore, since the strategy may change over time, it might be useful to also measure how many changes made in the strategy are pulled in the IBP process."

Q13: What factors determine how quickly SA can be achieved?



Top 4 topics referenced by respondents are conditions within the CF => Supports the efficacy of the CF

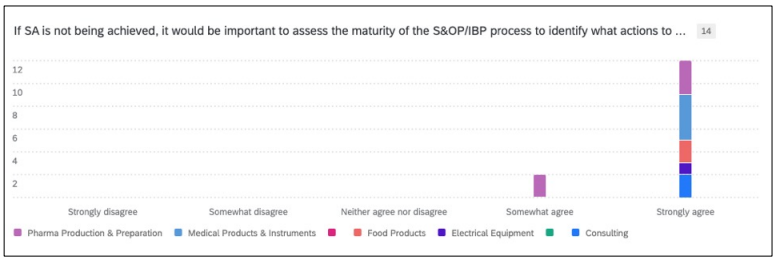
Q16: If SA not being achieved then need to assess maturity?



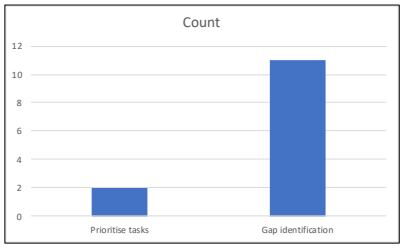
Reinforces the need for maturity assessment to be part of the conditions. Also indicates that maturity is required for SA and therefore feedback loop to maturity is important if not being achieved as expected.

By role

By industry



Q17: Reasons why need to assess maturity if not achieving SA



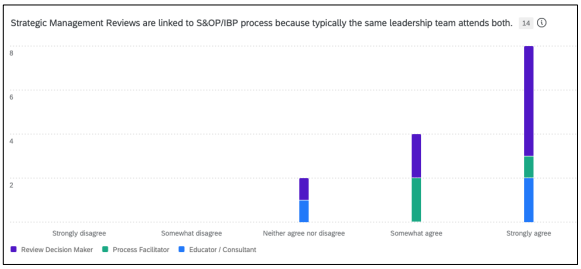
"Only by assessing the maturity of the process can you truly identify and address the gaps to achieving SA" – PF1

"A review of the maturity of the S&OP/IBP would ensure correct timing and sequence of activity" – CT2

"Walk before running - maturity reflects the priorities of what needs to be achieved before gaining value of activities on higher maturity" – CT3

"The S&OP/IBP is a key process to achieve SA. If SA is not being achieved, if one is not getting closer to it, the S&OP process must be revisited - as something is just not working. Either there are gaps/blindspots on the S&OP process. Or the S&OP process is not driving the right actions." – DM3

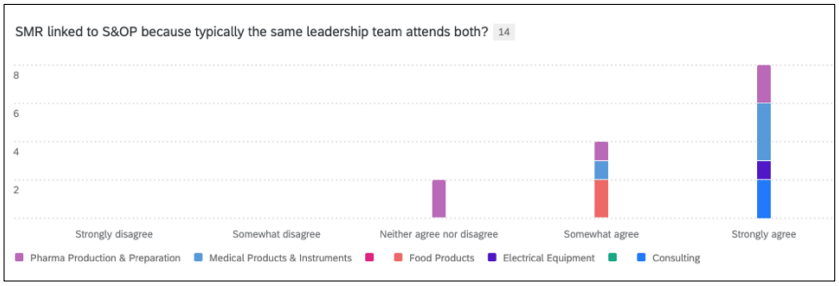
Q19: SMRs are linked to S&OP through leadership team attending both?



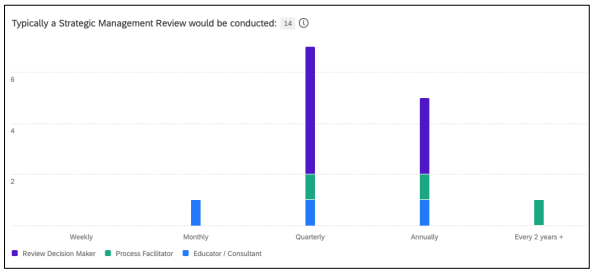
Link from S&OP to SMRs should be further investigated with future specific research.

By industry

By role



Q20: Typically a SMR would be conducted:

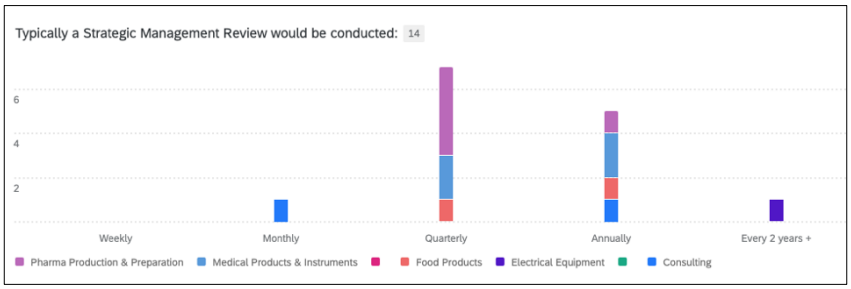


Quarterly or annually is the view of the majority of experts.

By industry

By role

Link from S&OP to SMRs should be further investigated with future specific research.



Appendix 4.9: Final Report sent to Expert Panel

Sales and Operations Planning (S&OP) Delphi Study Report

Report compiled by

Jerry Shanahan
PhD Student
Cork University Business School
University College Cork

August 2022

Background to Study

The focus of this study was to acquire expert empirical input into understanding the concept of Strategic Alignment (SA) in Sales and Operations Planning (S&OP). The starting point of the study was an initial Conceptual Framework (CF) that captured the key areas of focus when it comes to SA and how they related to each other. This initial CF was the result of an extensive review of the academic and practitioner literature to determine what knowledge existed in the literature to explain this concept.

Introduction

There are no shortage of definitions for S&OP in the literature and a simple one that captures the essential objectives of the process can be found in Grimson and Pyke (2007)

"S&OP is a business process that links the corporate strategic plan to daily operations plans and enables companies to balance demand and supply for their products".

Grimson and Pyke (2007, p.323).

Inherent in this definition are two explicit objectives for the S&OP process – *"link strategic plan to operations plans"* and *"balance demand and supply"*. Two terms to describe each of these objectives that are most prominent in the literature are *"vertical alignment"* and *"horizontal alignment"* respectively (Kristensen and Jonsson, 2018). In this context vertical alignment can be broken down into two focus areas: *Strategic Alignment* to ensure S&OP is linked to the business strategy and *Operational Alignment* to ensure S&OP is linked to the day to day short-term planning, as shown in Figure 1.

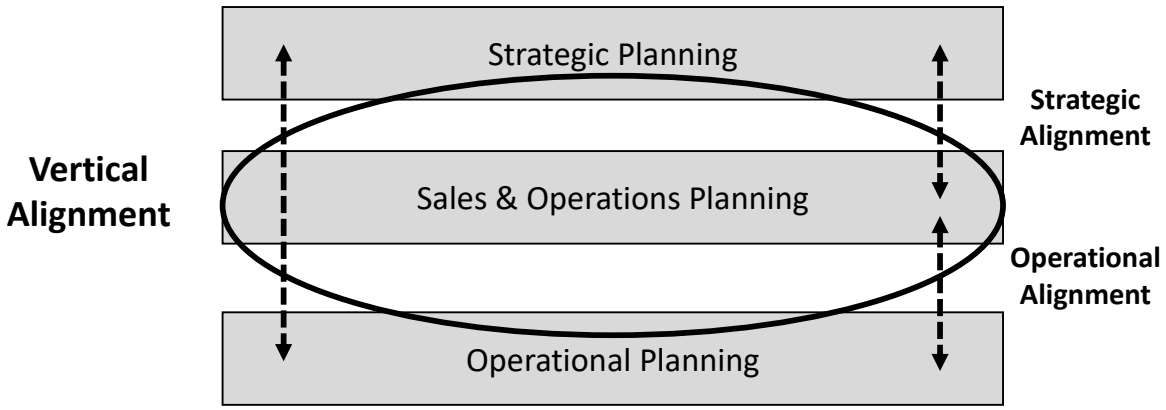


Figure 1: Strategic Alignment and Operational Alignment elements of Vertical Alignment

The focus of this study was specifically on the SA aspects only.

While SA is explicitly called out as part of the S&OP definition, practitioners over the years have continually expressed frustration at companies lack of ability to actually achieve SA within their S&OP processes. Alexander (2013) describes this as the *"the Control-Growth Paradox"*. What he describes is the often opposing tensions within an organisation to drive for the pursuit of *growth*, while having a strong desire to stay in *control.* He goes further to propose that historically S&OP had grown from a *control* mindset and therefore tends to be focused heavily on how best to align supply plans with the requirements of demand plans. It is only by recognising the fundamental role that S&OP has in deploying the strategy, that the process can be orientated towards supporting the delivery of the *growth* targets for the business. The response from the practice was to accept that the focus of S&OP was primarily to balance demand and supply (horizonal alignment) and to focus on a different but related process called Integrated Business Planning (IBP). This process, which was pioneered by consulting company Oliver Wight (Palmatier and Crum, 2013) put much emphasis on the objective of the process as being a vehicle to deploy the strategic plan and ensuring full financial integration was achieved. Interestingly, IBP is not formally defined in the academic literature and where mentioned it is regarded as a maturity stage of the S&OP process (Danese et al., 2018). However, what is clear from all the literature is whether the process is called S&OP or IBP, when it comes to SA companies struggle to achieve it, as demonstrated by the lack of longer-term / strategic decisions that actually get made in the process reviews. From an academic perspective, while the importance of SA to achieving the full ambition from the S&OP process is recognised, there are no specific academic studies that have been conducted to understand what SA actually means and how to best go about achieving it in S&OP. In fact there have been repeated calls over the years for research to be conducted in this important area for academia and practitioners (Kreuter et al., 2021b).

Delphi Study

The Delphi method was developed by the Rand Corporation in the 1950's (Skinner et al., 2015) as a technique for future forecasting, through engaging the opinions of independent participants, considered to be expert in the topic, leading to reliable conclusions (Baker et al., 2006). One of the important advantages of the Delphi method over focus groups, is that the

participants remain anonymous to each other and therefore cannot be influenced by a potentially dominant expert. The selection of experts for the Delphi study is a crucial aspect to ensure rigour and trustworthiness. Putting a strong weight on the inputs of a relatively small sample of experts is one of the key differentiators versus traditional surveys, where a large random sample is required (Keeney et al., 2001). Therefore the selection of experts for this study was based on candidates meeting a number of key criteria as follows:

- Have been formally educated in S&OP/IBP
- Are either a Decision Maker in S&OP/IBP Reviews, a Facilitator in the reviews, a Process Owner or Process Educator.
- Have authority to influence the design of the S&OP/IBP process.
- At least 5 years experience with the S&OP/IBP process.

With a focused panel of experts defined, the Delphi process consists of a series of rounds in an attempt to achieve consensus from the panel. The first round typically has a number of open questions to attract broad qualitative inputs that once analysed, can then inform the subsequent round. For this study three rounds were conducted before it was deemed sufficient to conclude the study.

The starting point for the study was a Conceptual Framework (CF) that was the result of a synthesis of the existing literature on SA in S&OP. As there were no specific studies that had been explicitly focused on this topic, an Integrative Literature Review (ILR) approach was taken (Torraco, 2016) which enabled any knowledge that could be extracted from related S&OP studies to be gathered and constructed into a CF that reflected the current knowledge on SA and how to go about achieving it in S&OP. The initial CF is shown in Figure 2:

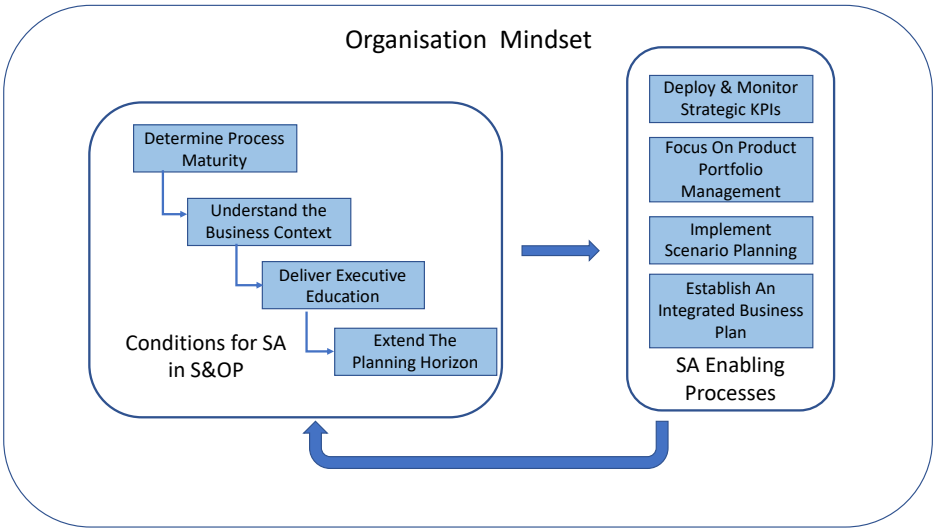


Figure 2: Initial Conceptual Framework (CF) from the literature

With no formal academic studies conducted to date, the Delphi study was particularly important to allow a critique and adjustment of the CF to make it more robust based on actual field experience. An explanation of the initial CF was provided to the expert panel in advance of the round 1 survey (see appendix 1).

Delphi Process

The Delphi process was conducted over three rounds of surveys with all 15 recruited experts responding to round 1 and subsequently 14 experts responding to rounds 2 and 3, with one expert having to opt out after round 1 due to unforeseen circumstances.

When analysing the data both qualitative and quantitative techniques were used to build robust conclusions. In addition, a research team of three collectively reviewed the results and aligned on conclusions from each round. The results were aligned into three categories:

1. Sufficient evidence to conclude consensus on a topic.
2. Inputs warranted further investigation in subsequent round.
3. Useful insights not relevant to core study objectives but worth recording for future investigation.

A summary of the overall process flow is shown in Figure 3:

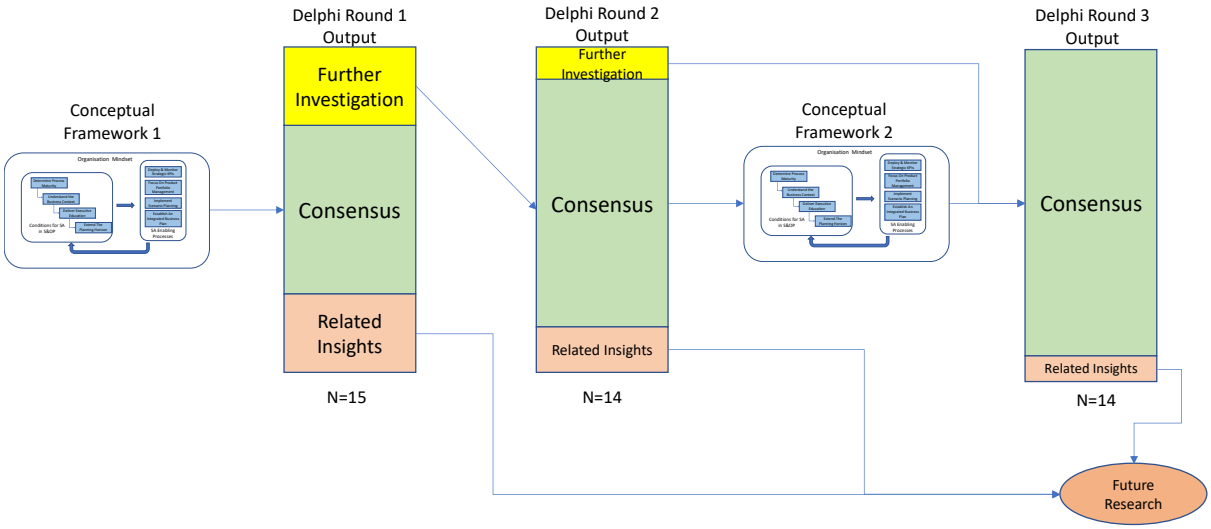


Figure 3: Delphi Study Process Flow

As shown, following the inputs received in round 1 and round 2, an updated version of the conceptual framework was presented to the expert panel for round 3.

Results

The detailed analysis that was conducted between each of the three rounds is described in Appendix B. At the conclusion of the study there was consensus from the expert panel on a revised CF, as shown in Figure 4.

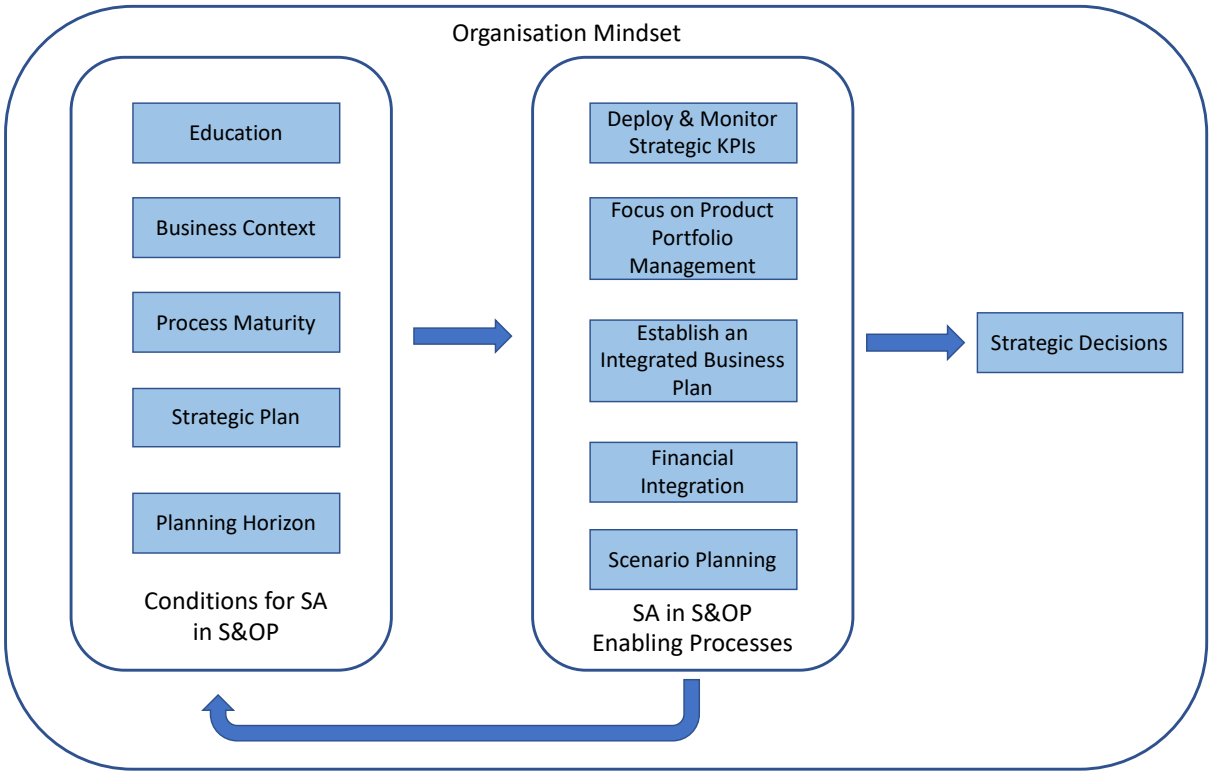


Figure 4: Revised Conceptual Framework for SA in S&OP

The results obtained from engaging with the expert panel provided some significant insights in building a more robust framework. The changes from the original framework are as follows:

1. The sequencing of the conditions was removed. This reflected the differing experiences of the individual experts.
2. The verbs associated with the condition elements were removed to avoid being too prescriptive on what actions should be taken with each condition and reflecting the inputs on how these elements are influenced by the feedback process.
3. The condition of *Conduct Executive Education* was broadened to *Education* reflecting the input that while executive education was clearly viewed as being critical, it was equally important that education was given to all parts of the organisation that were involved with the S&OP process.
4. A significant addition to the set of conditions was that of *Strategic Plan*. This was raised in round 1 and investigated further in subsequent rounds, with strong consensus that having an executable strategic plan visible within the S&OP process, as being crucial for achieving SA.
5. All of the SA processes defined in the initial CF were deemed to be essential. However, the expert panel put strong emphasis on a number of key supporting processes that were embedded in the original model but not explicitly called out. This resulted in updating the specific process of *Implement Scenario Planning* to a more broader scope called *Ensure*

SA Process supports in Place, which included scenario planning, tracking strategic assumptions, understanding decision lead-times and tracking strategic projects.

6. Another element that was embedded in the original strategic framework under *Establish an Integrated Business Plan*, was viewed by the experts as being important enough to be explicitly called out in the CF. Therefore the element of *Financial Integration* was called out within the SA processes with a link shown directly to the Integrated Business Plan.
7. A key structural change was driven by the consensus to track the number of strategic decisions made, as an indicator that strategic alignment was being achieved. Therefore this aspect was added as output in the framework.
8. Beyond the structural changes to the CF, there were many valuable insights that explained what is actually involved in practice behind each of the elements and these formed part of building the robustness of the revised CF. These are covered in detail in Appendix B, but examples include:
    a. Addressing a typical blocker to SA of organisations constantly being dragged into short-term activities in the reviews, by formally structuring a separate but linked process for managing the 0-3 month horizon.
    b. Leadership commitment to the process as being a key element in achieving the organisation mindset for SA in S&OP.
    c. The feedback process as being fundamental to ensure continuous improvement with typical feedback going to challenging the quality of the strategic plan for enabling SA and also having to re-assess maturity to identify specific actions to be taken.
    d. Linking the process to a Strategic Management Review (SMR) that is run either quarterly or worse case annually, is important to maintain SA.

The inputs provided on the importance of linking to a separate process for handling the 0-3 month horizon and also linking to the strategy management process through the Strategic Management Review (SMR) reinforced the positioning of S&OP in the overall planning hierarchy as shown in Figure 5.

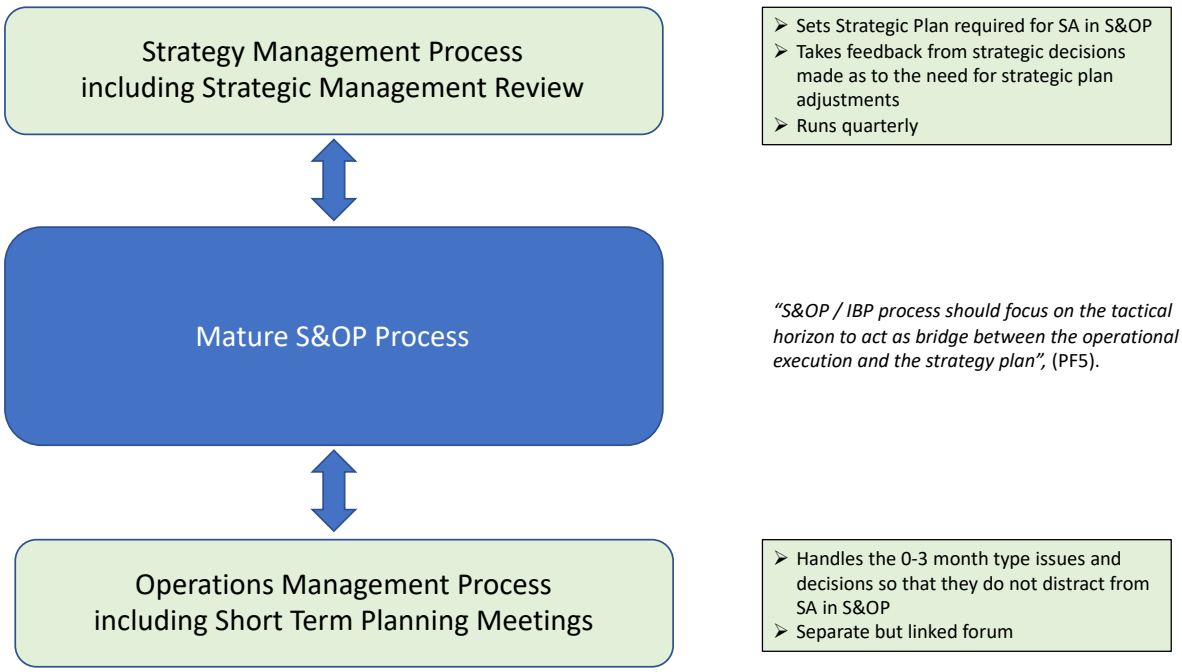


Figure 5: Positioning S&OP in the Planning Hierarchy in support of 'SA in S&OP'

While the literature positions S&OP as a tactical planning process with links to strategy and operations (Grimson and Pyke, 2007), the Delphi Study reinforced the importance of this and the practical ways of making it happen, in support of achieving strategic alignment in S&OP.

The area of software support was explored to a limited degree as part of this Delphi study. It was recognised by the research team that this is a very large topic that warrants a specific study of its own. However, some preliminary information was obtained from the experiences of the expert panel that can form the basis for future research. While the detail is contained in Appendix B, some of the specific insights obtained include:

- When it comes to Data Analytics (DA) the expert experiences is that it is mainly descriptive and diagnostic analytics that are deployed but when it comes to enabling SA they believe that the combination of diagnostic and predictive analytics is most important.
- Some differing perspectives on how important a role software has when it comes to SA but if it has a role then it is about providing a predicted view of the business.
- Also, whether decision makers trust Decision Support Systems (DSS) produced some conflicting inputs potentially indicating the that the decision maker has to be directly involved in such decisions, even if software is used as a support.
- General view that software will play a bigger role in the future when it comes to SA in S&OP.

While key attributes were captured to be able to profile the expert panel, there were no attribute-based contexts of significance, to the responses that were provided. This indicated that when it comes specifically to SA in S&OP then the following attributes do not provide any significant context of significance:

- Specific role with S&OP in terms of Educator, Facilitator or Decision Maker.
- Industry where S&OP was experienced.
- No. of S&OP instances that worked with.
- No. of successful achievements of SA in S&OP that have witnessed.
- Seniority within the business.

Conclusions

The unfulfilled ambition of S&OP is something that practitioners have been expressing for many years. A quote from Baumann (2009) captures the concern:

"Another major concern that has surfaced more recently around S&OP is its purely tactical near-term focus and disconnect from a company's overall business strategy, which can result in missed opportunities." – Baumann (2009, p.12).

Similarly when Dunn (2019) wrote about the extra value that could be extracted from a given S&OP process he stressed the requirement for strategic alignment :

"A method for decision-making that can prove to be effective is to consider the overall impact on the business which includes the financial and strategic implications." – Dunn (2019, p.30).

To date the academic community have only provided limited knowledge in support of this important topic for practitioners and this was reflected in the initial conceptual framework that triggered the Delphi study.

With the support of the expert panel, a revised conceptual framework has been constructed that captures the real-life experiences of expert business practitioners in S&OP. This has resulted in a much more robust framework that can form the basis of building mid-range theories about this important topic.

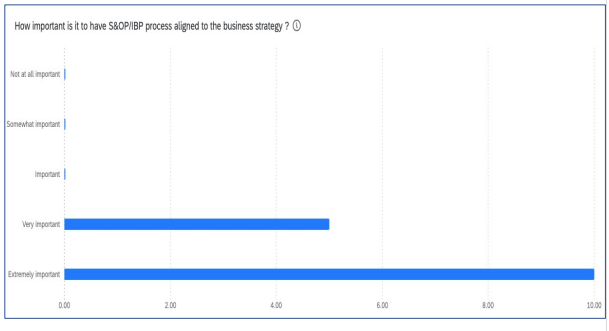
In terms of next steps, it would be beneficial to test the conceptual framework in the field by conducting an intervention in at least one case study type environment, whereby the direct impact of implementing the elements of the framework could be assessed.

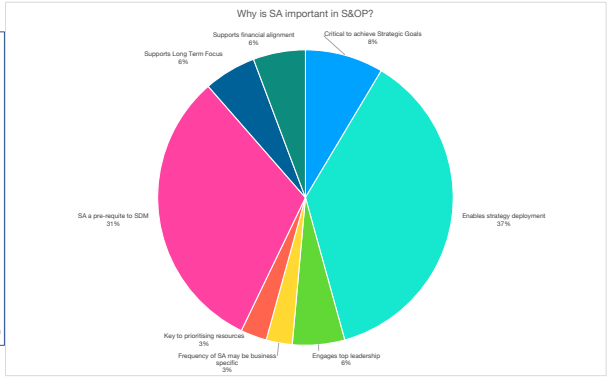
Appendix A – Repeat of initial description provided (see Appendix 4.1)

Appendix B – Details of analysis between rounds (as part of Final Report to Respondents)

Round 1

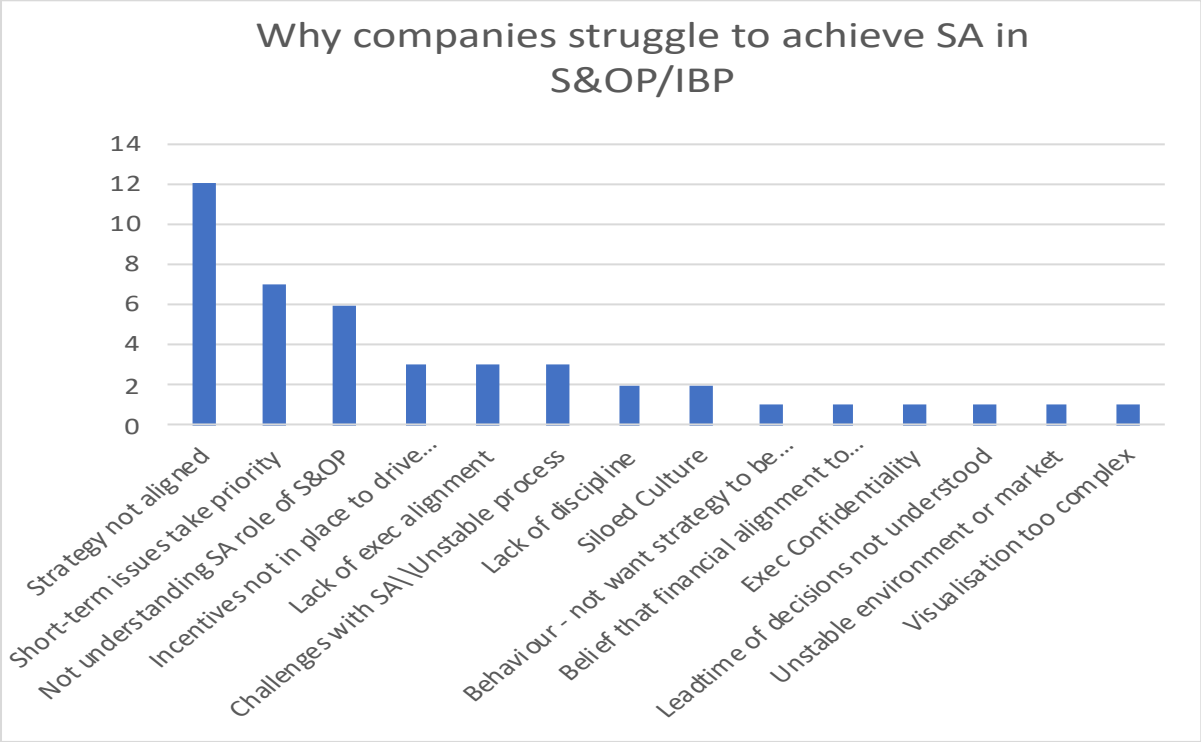
From round 1 it was clear that the expert panel believed that SA was important for S&OP and some of the main reasons given related to the deployment of the strategy through S&OP and ultimately enabling strategic decision making.



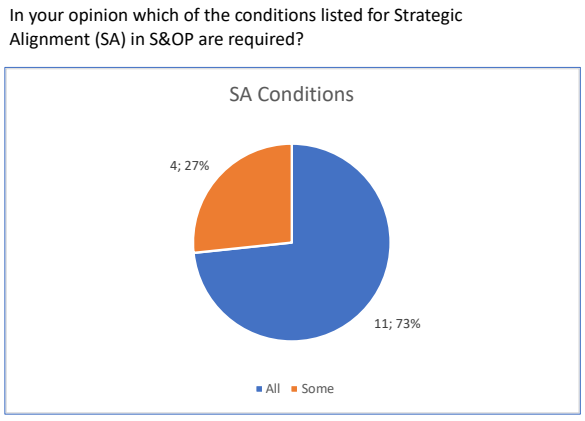


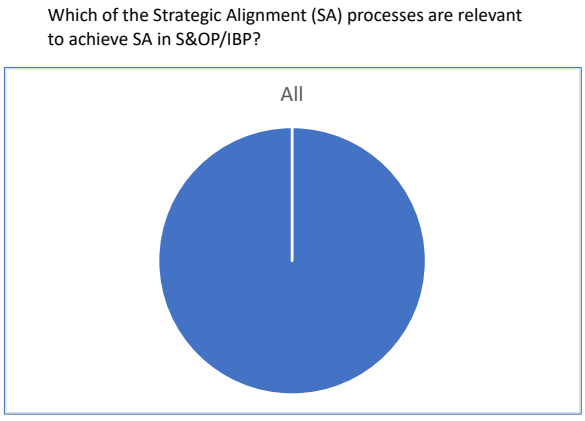
When it comes to why companies struggle to achieve SA in S&OP, the top three reasons given related to the lack of alignment to an executable strategy, the continuous pull of

attention towards the short-term issues and a lack of understanding of the role SA in S&OP. The input on lack of understanding aligned with the CF element of executive education but the other inputs prompted further investigation in round 2. In particular to determine how prominent the role of the strategy and the associated strategic plan should feature in the CF and how the short-term issues challenge should be addressed.



The inputs on the CF indicated that there was further analysis required to determine the content and relationships that were implied by the *Conditions* but there was unanimous agreement that all of the *Processes* were important.

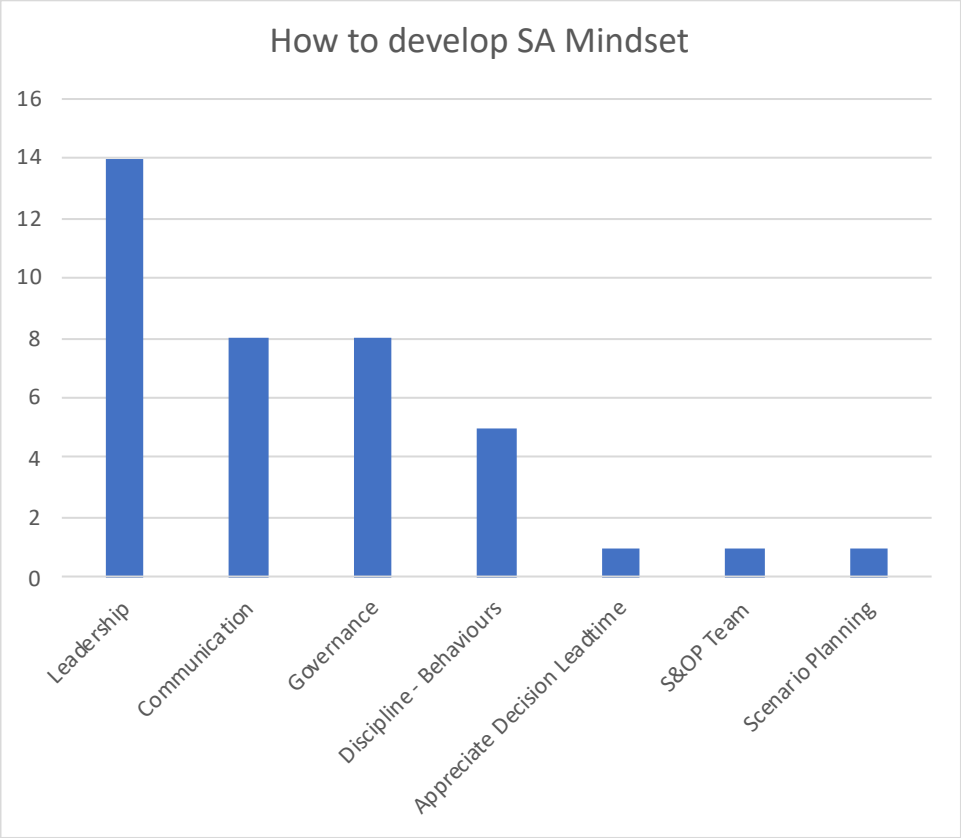




When asked about the importance of the feedback loop from the SA processes to the conditions there was strong consensus on the importance of the feedback loop. In terms of providing reasons for their perspective, a key input focused on the requirement for continuous

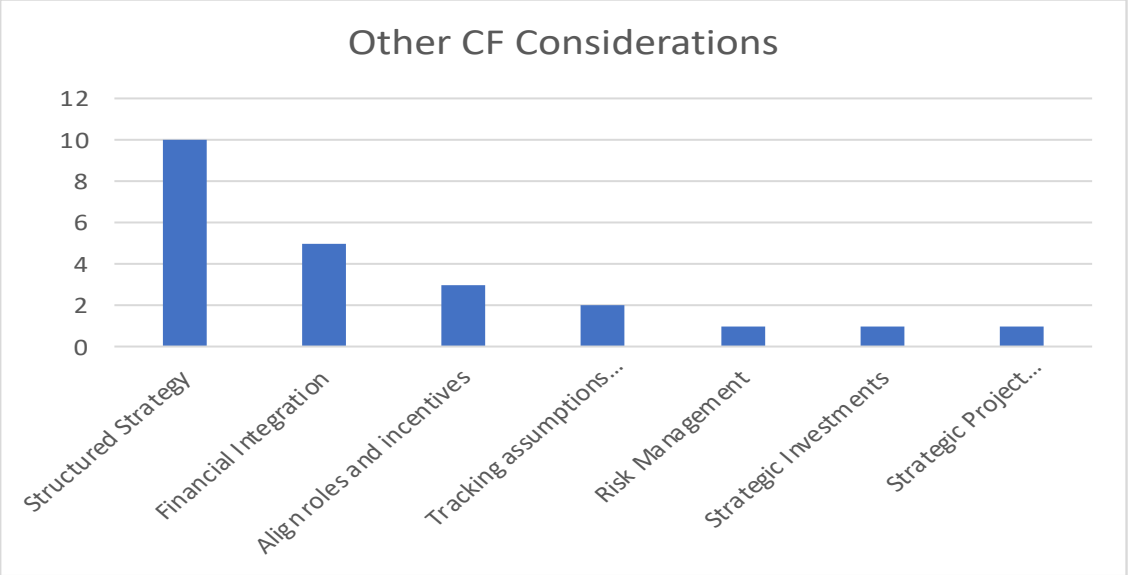
improvement. This prompted further analysis in the next round to understand which areas were more likely to be involved in the continuous improvement loop.

The key ingredients to support the development of a SA mindset within the organisation revealed a number of novel inputs in addition to the ones that might be expected.

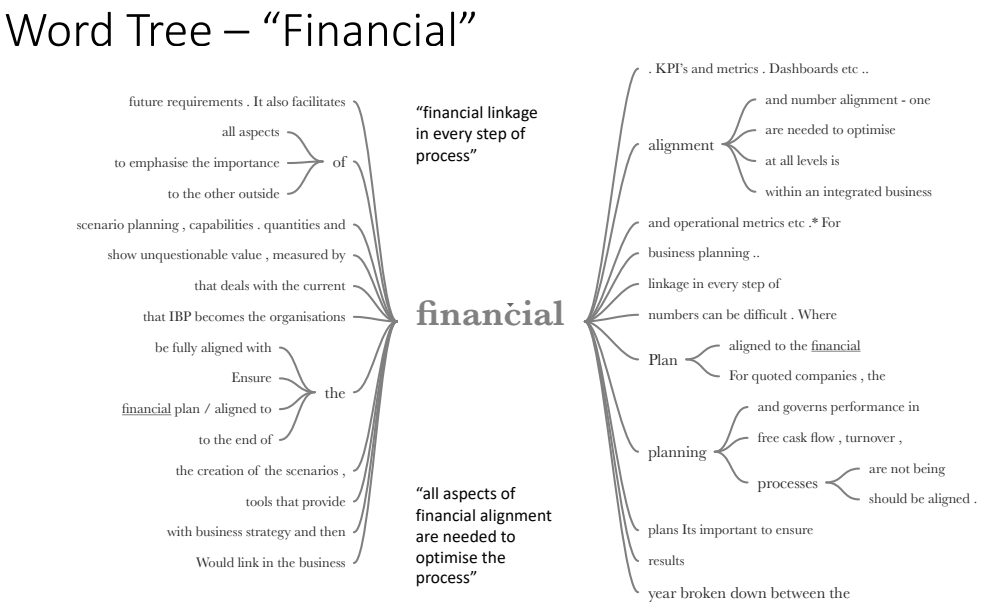


In order to get the entire expert panel's perspective on the novel elements of appreciating the decision lead-time and the role of the S&OP team, these areas were identified as areas for further investigation in round 2.

Looking beyond the critique of the initial CF, when the experts were asked if there were other key considerations to be explicitly represented in the CF then the top three areas pointed to having a structured strategy, ensuring full final integration and leveraging incentives to drive the SA behaviours.



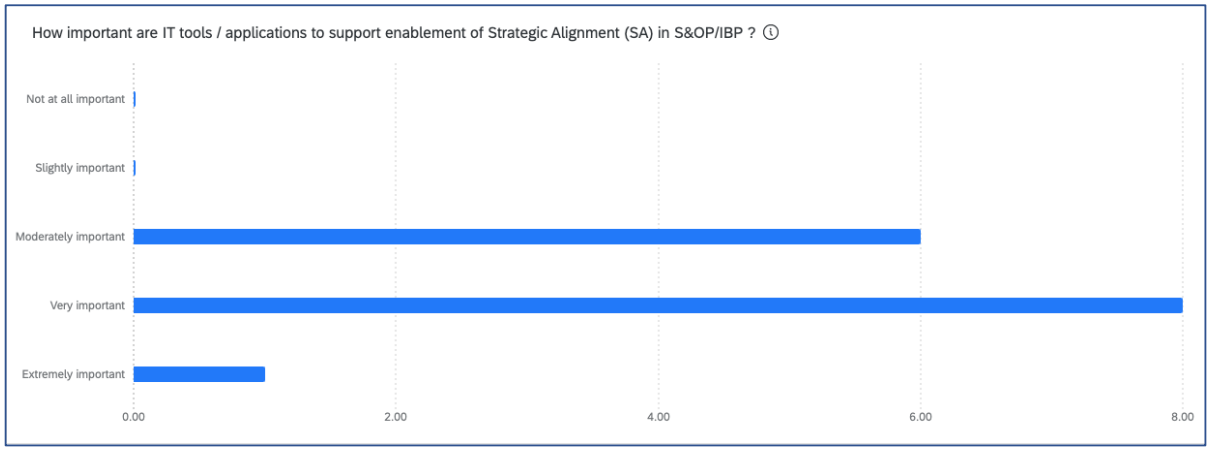
Some of these elements were built into the initial CF as embedded concepts within others. For example financial integration was a core element of establishing an *integrated business plan*. However this particular aspect was mentioned in many different contexts as shown by the following word tree:



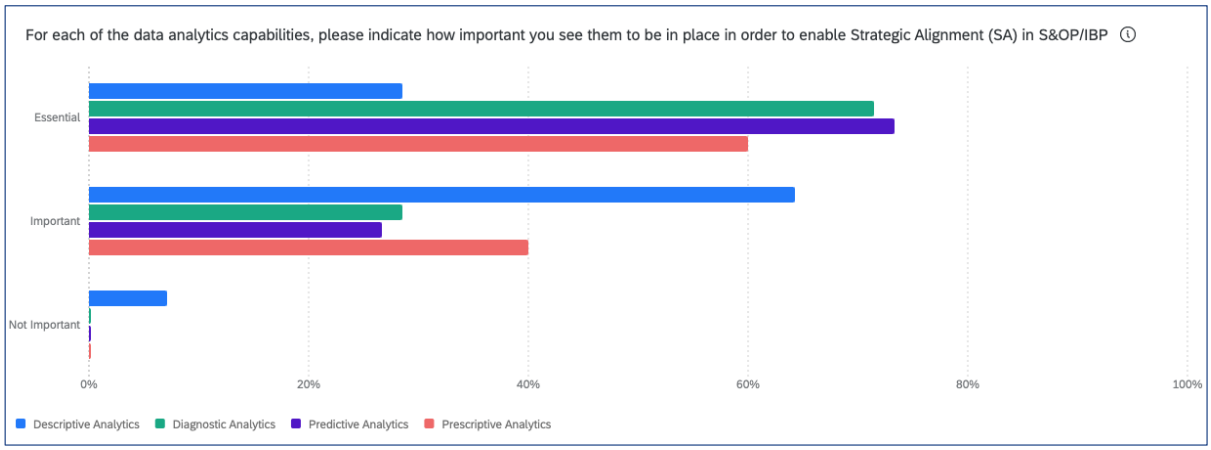
The input on having a structured strategy supported a number of inputs across the survey responses indicating the potential for a new element to be added to the CF that did not exist in the initial CF. These extra elements whether they be new elements to ones that need to be more explicitly stated triggered key survey questions to be explored further in round 2.

The final part of the round 1 survey focused on the role of software and in particular Data Analytics (DA) in supporting SA in S&OP. It was interesting to note that while it appeared

that the expert panel believed there was a role to play, there was no consensus on how important it was as an enabler to SA.



This response profile was quite different to the profile when considering the core elements of the initial CF. Looking at the type of tools that the expert panel view as playing a role in SA in S&OP then the top response was a general one on S&OP software. This implied that the expert panel in general were not invested in data analytics capabilities at this stage as a necessary requirement but did see the need for supporting tools. Therefore, in round 2 it was decided to focus more on what the application of the tools might be to get insights more into how the tools can help. Specifically as it relates to DA the feedback indicated that *predictive analytics* would be the most essential supported by diagnostic analytics. This could indicate the need to have a good understanding of current performance (diagnostic analytics) before providing a predictive view of the future (predictive analytics) to enable SA.

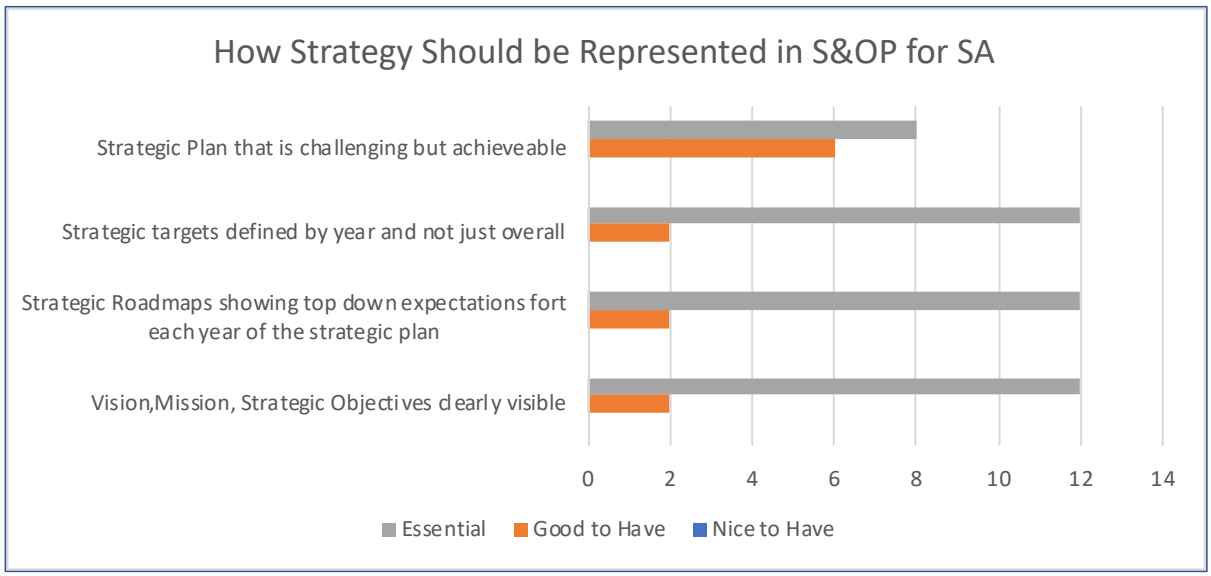


Interestingly there was less agreement around how essential prescriptive analytics were to the process. Recognising the broad scope of the study and the need to stay focused on the CF, then it was decided by the research team that the topic of DA as a support to SA in S&OP would not be pursued further as part of this study but results will be filed to be investigated further by a separate study in the future.

Round 2

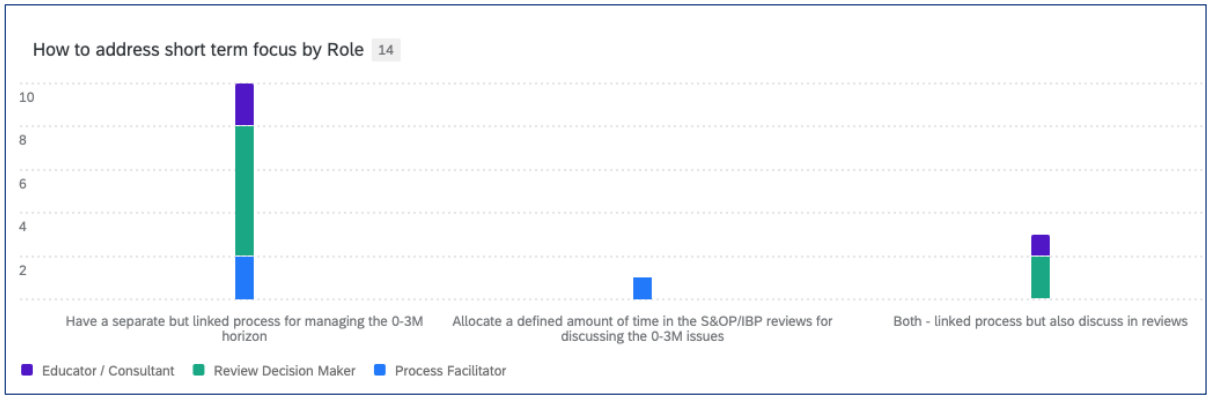
Having identified a number of areas that required further investigation from round 1, the structure of round 2 was such that there was less qualitative open questions and more selection type questions in order to get the collective perspective of the expert panel on specific topics.

One of the key topics that emerged from round 1 was the important role the strategy and associated strategic plan has, as a condition for achieving SA. Investigating this further in round 2, the expert panel provided practical input into how this should be represented.



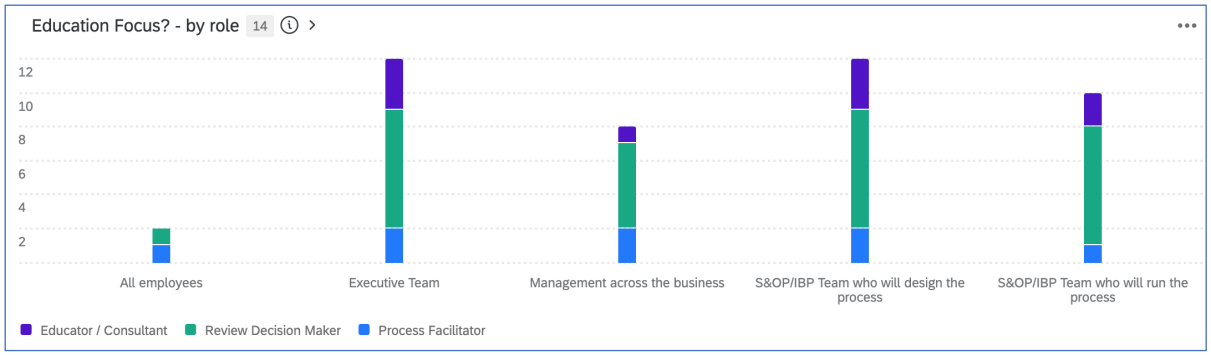
The practical inputs of ensuring that the yearly strategic targets are explicitly stated and the associated expectations as represented by strategic roadmaps are in place, would indicate that beyond having a Strategy that is communicated, a formal Strategic Plan needs to be visible in the S&OP process.

With the continuous pull of the short-terms issues being identified as one of the key challenges to achieving SA in round 1, the expert panel believe that the best way to address this is to ensure there is a separate but linked process that specifically deals with the issues of the 0-3 month horizon.



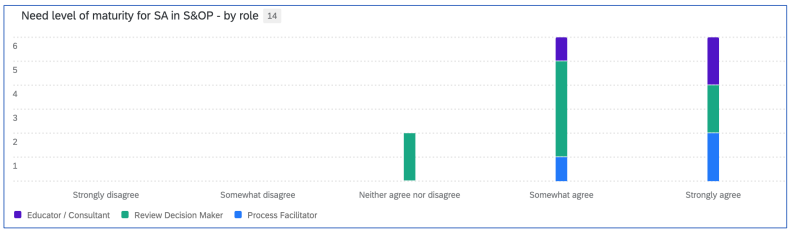
By presenting the novel input from round 1 that incentives could be used to encourage SA in S&OP, the expert panel perspective confirmed this strongly. On analysis this prompted further investigation in round 3 to understand if incentives were to be used then how could SA be measured to understand if it is being achieved or not.

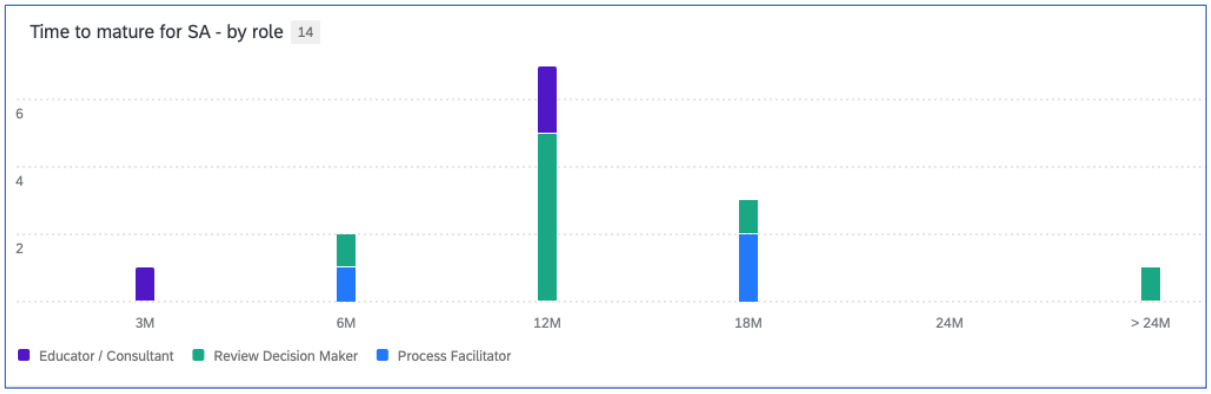
The importance of education was a key theme throughout the responses in round 1. In round 2 clarity was brought to the fact that this education goes beyond just the executive education (as indicated in the initial CF) to all areas of the organisation that are involved in the process.



Exploring the topic of process maturity in terms of initial assessment and requirement for a level of maturity to enable SA, revealed that the experts view the understanding of maturity to be important but experiences indicated spread of how long it typically takes for a S&OP process to mature to point where SA is achieved.

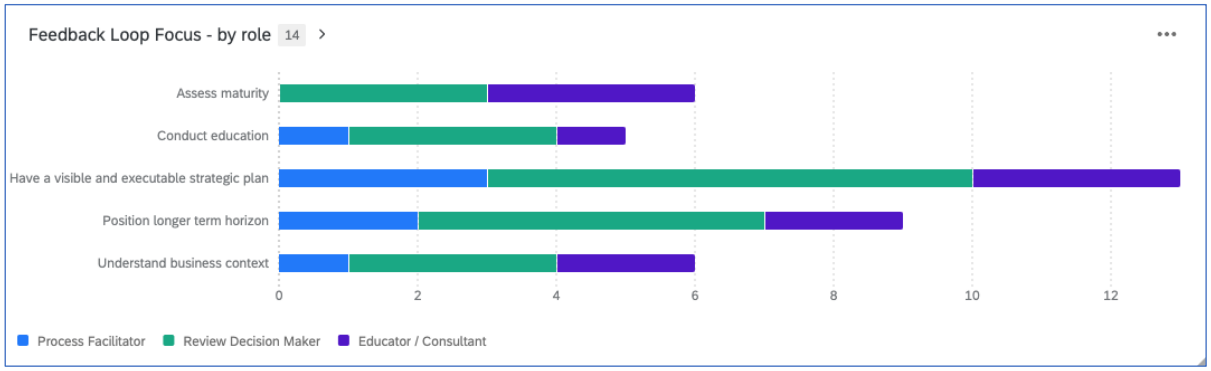






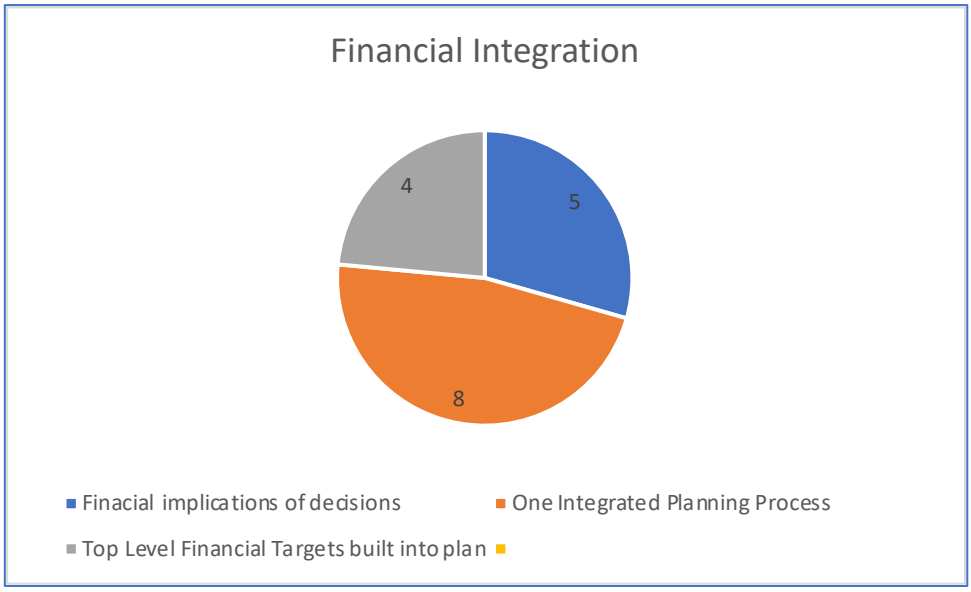
The spread of experiences with regard to time to achieve SA prompted further investigation in round 2 tied to the perspectives on maturity.

Reflecting further on the importance of having an executable strategic plan as a condition, the expert panel indicated that if SA is not being achieved then the feedback loop would most likely be directed towards reviewing the the presence and quality of the strategic plan.

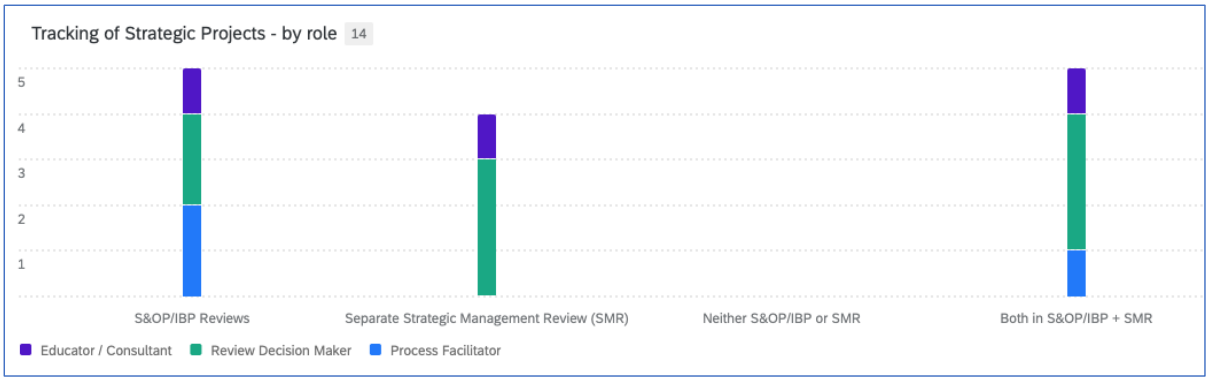


Linking to some specific feedback from round 1, the expert panel confirmed the importance of a number of enabling aspects, including the understanding of the decision lead-time, the confidence that the decision maker has to have in the S&OP team, clarity around roles and responsibilities, explicitly stating strategic assumptions and ensuring that strategic projects are tracked in the S&OP reviews. All of these elements clearly have to be considered in the structure and supporting detail to the conceptual framework.

The prominent feedback from round 1 on the importance of financial integration was investigated further in round 2 with unanimous response that this aspect should be explicitly called out in the conceptual framework and some explanations as to what it actually means.

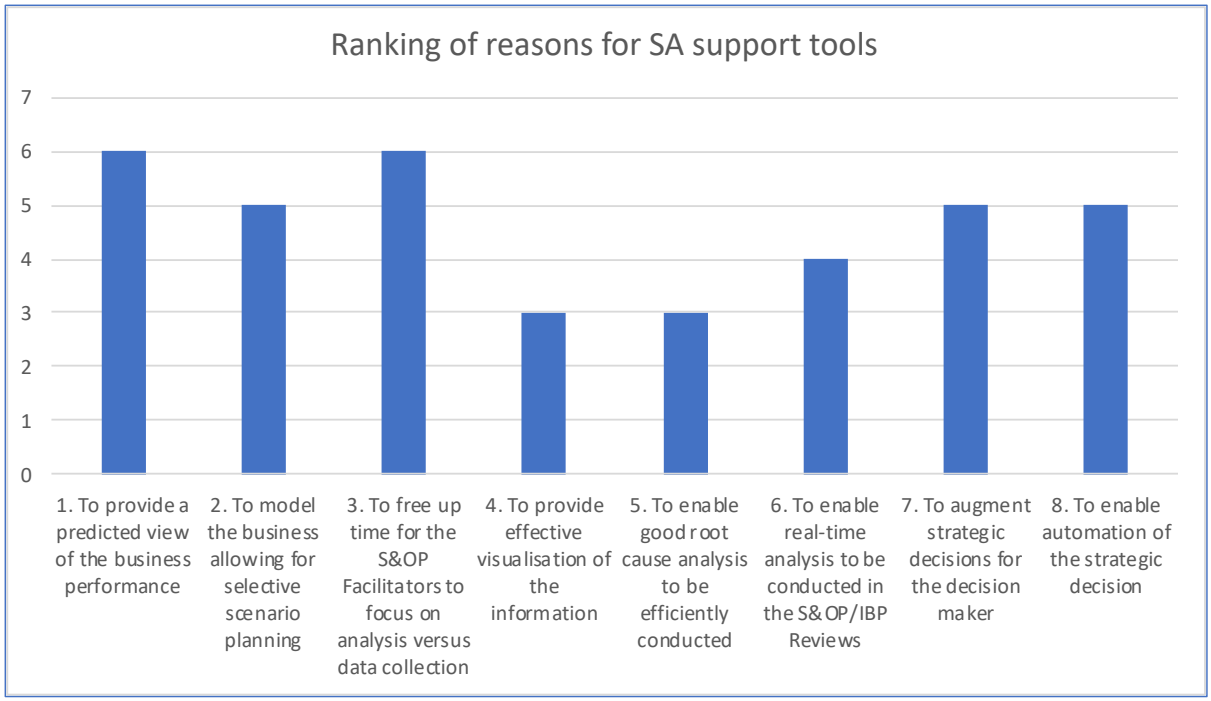


The important link to the strategic plan when it comes to enabling SA was further reinforced with a strong view that there needs to be a separate Strategic Management Review (SMR) linking to the S&OP process.

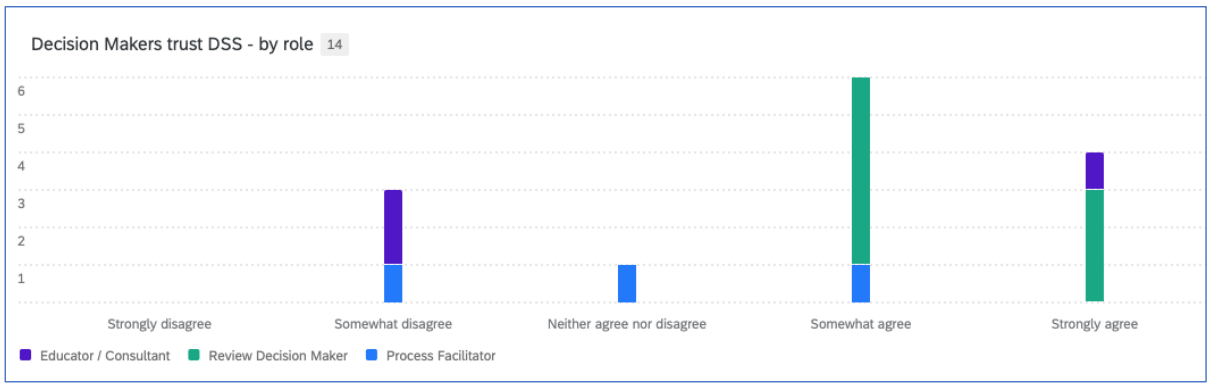


This prompted some further investigation in round 3 to understand how often a SMR should be held.

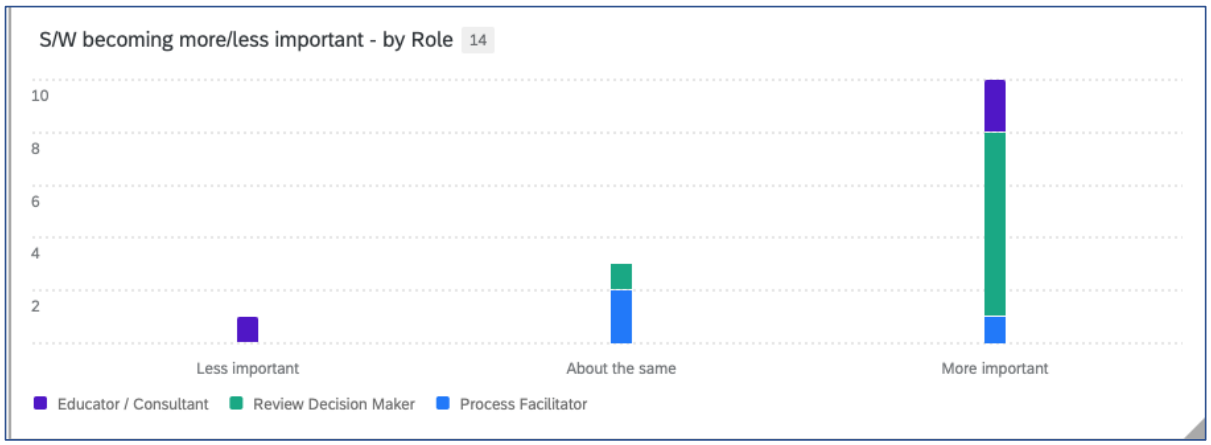
Building on feedback in round 1, there were some further insights provided as to the role of software when it comes to SA in S&OP. The highest ranked reason for using software was to support the predicted view of the business.



In terms of whether decision makers trust Decision Support Systems (DSS), while the decision makers who responded were positive, the facilitators whose role is to try and enable decision making in the reviews, were less convinced. This is an area for further research in a more dedicated study on the role of software.



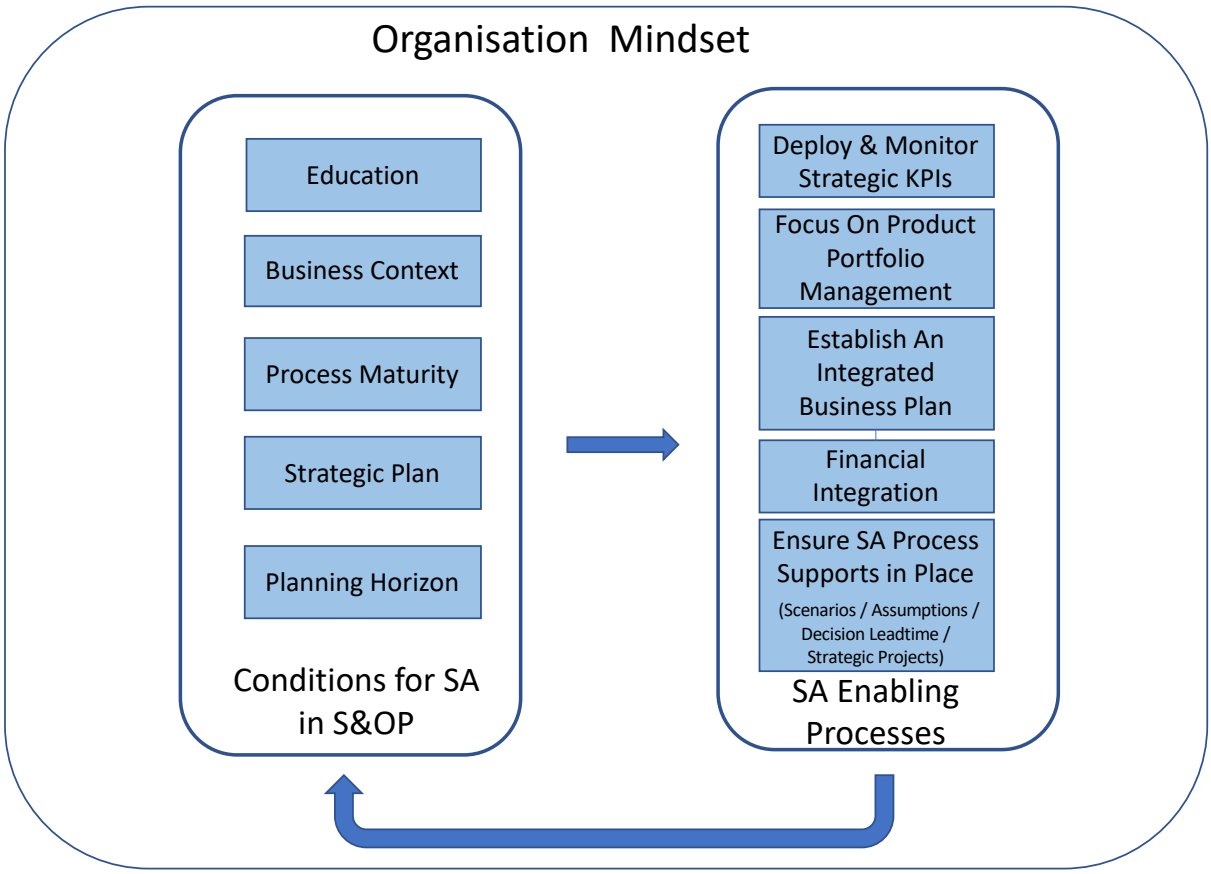
Looking to the future while there was a strong view that software would play a bigger role, there were a number of inputs to say that it would not change or even be less important. This could be an indicator of the concern that such strategic decisions that would be triggered from SA would always require strong input from the decision maker who would be ultimately accountable for the implications of such decisions.



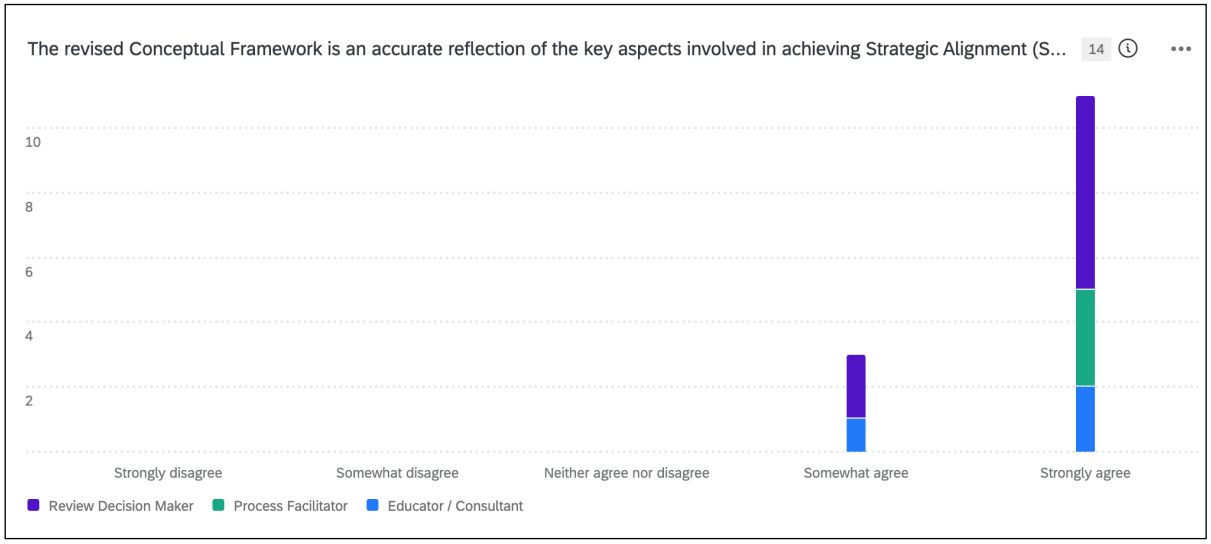
It was agreed with the research team that the inputs from the expert panel on the role of software were very valuable and should be filed as the starting point for a more in depth study in the future.

Round 3

With strong consensus having being received from rounds 1 and rounds 2 on the construct and content of the conceptual framework, then an updated version was created based on the feedback received to determine in round 3 if overall consensus could be achieved.

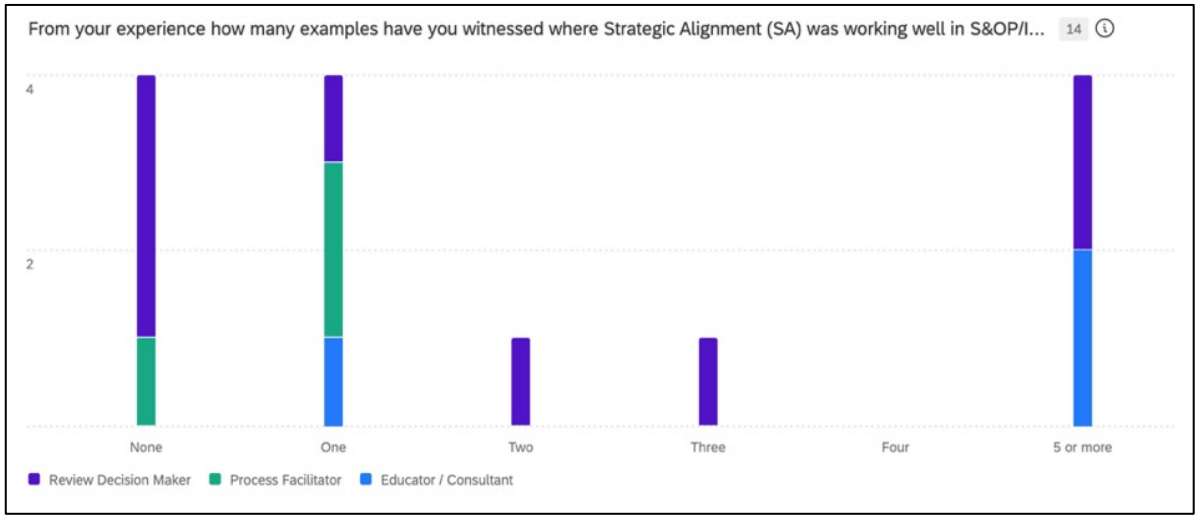


There was strong consensus that the updated framework reflected the collective perspective of the expert panel on how to go about achieving SA in S&OP.



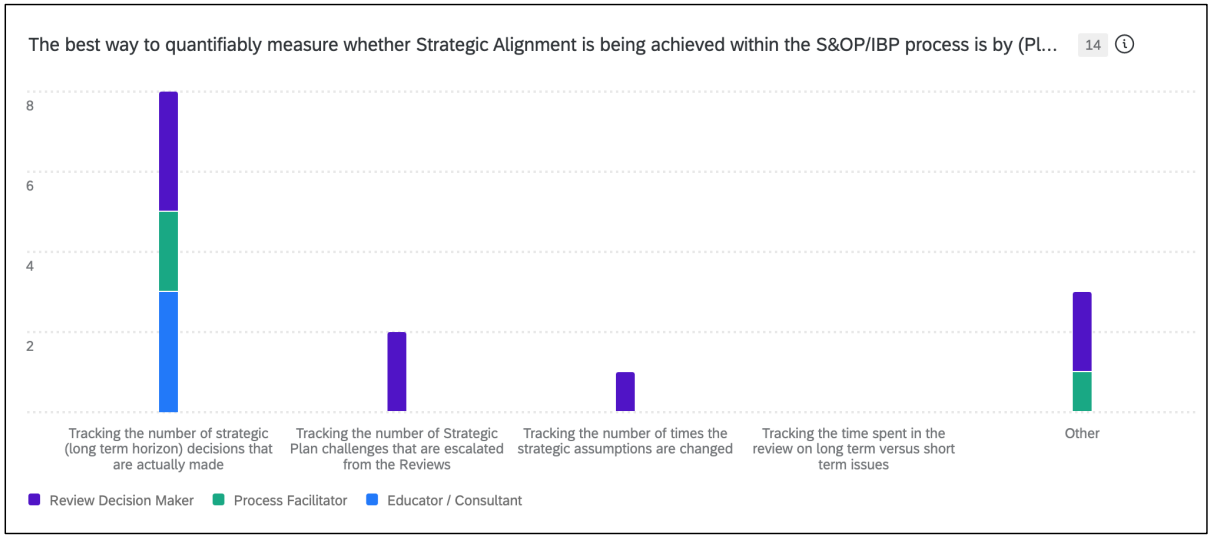
The qualitative feedback reinforced the construct of the conditions, in particular as it related to the strategic plan being in place and ensuring leadership discipline and commitment to the process was assured, which is the primary objective of the education.

In terms of the profile of the expert panel, it was interesting to note that 4 of the 14 respondents had never actually experienced SA in S&OP being achieved.



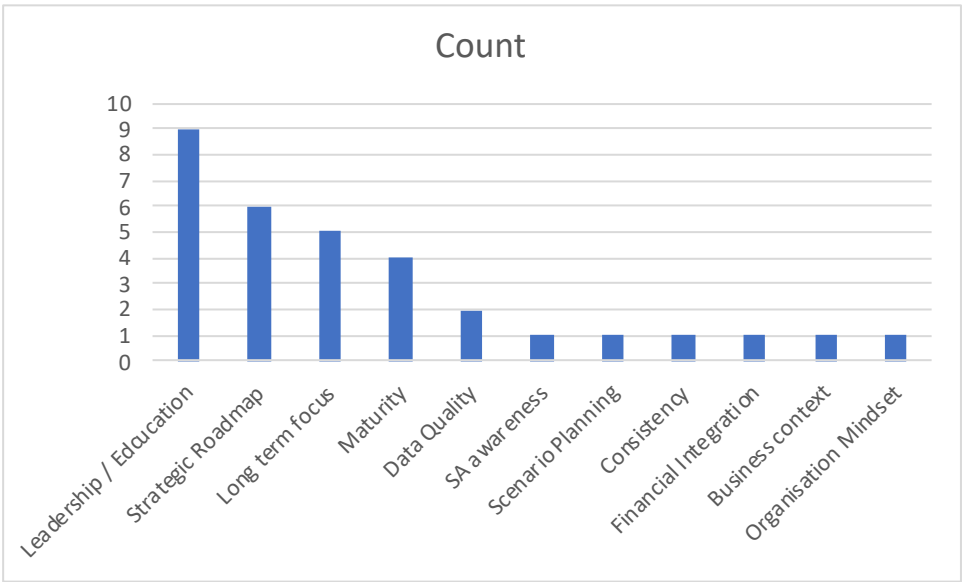
This is reflective of how challenging it seems to be for organisations to achieve SA in S&OP, as has been highlighted in the practitioner literature over the years.

Building on inputs from round 2 on potentially incentivising the organisation to support SA, then the highest ranked method for measuring SA was suggested to be the tracking of the number of strategic decisions actually made in the S&OP process.

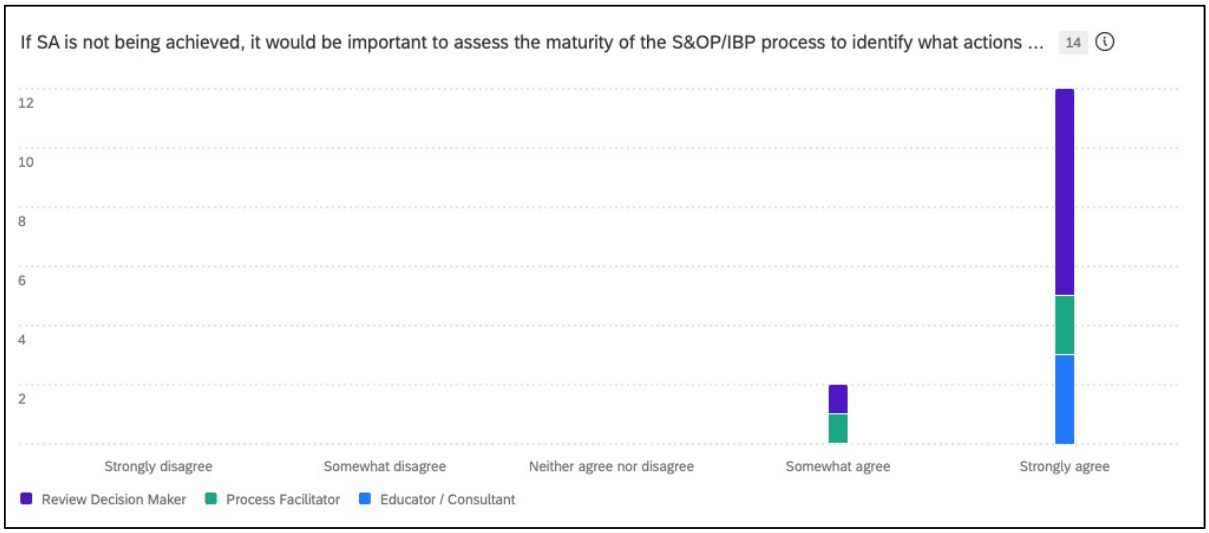


There were other suggestions in the qualitative feedback including the idea of having a series of measures rather than just one. This topic would benefit from being tested in a case study type environment to determine what could work and so inputs were captured for further investigation in the future.

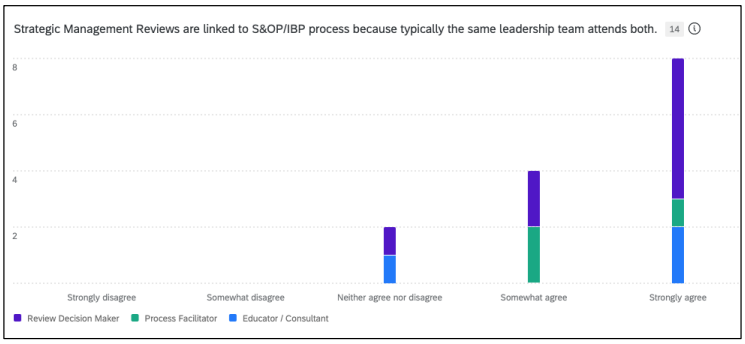
In round 2 there was a spread of experiences expressed in terms of how long it takes to achieve SA. In round 3 the experts provided their perspective on the influencing factors that determine how quickly SA could be achieved.

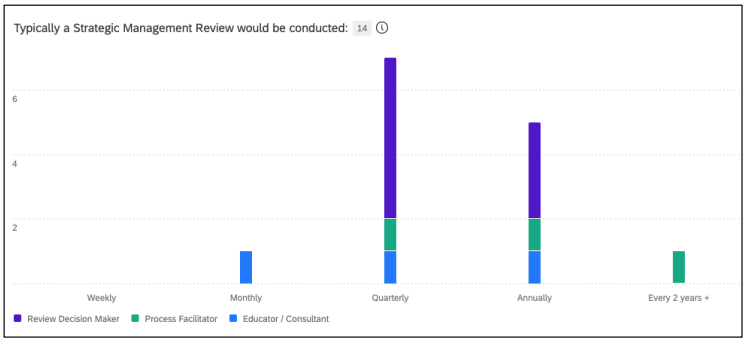


What was interesting is that the top 4 reasons given aligned with the conditions as defined in the CF, further supporting the efficacy of the framework. This linked to the topic of maturity that was further investigated in round 3. There was strong consensus that if SA was not being achieved then by re-assessing maturity then the key areas that need to be addressed could be identified.



Finally, with the inputs in round 2 around linking the S&OP process to the Strategic Management Review (SMR), there was agreement that one of the ways that linkage was made was through having the same leaders involved in both the S&OP reviews and the SMR. Also the most prominent experience was that the SMR would run either on a quarterly or annual cycle.





The specific role of the SMR and the definition of the linkage between S&OP and SMR is an area that could form a specific research agenda to be investigated in the future, building on these inputs from the expert panel.

Appendix 4.10: Future Research data and analysis on role of IT in support of 'SA in S&OP'

Delphi Study: Preliminary analysis of data in support of future research into the role of IT in supporting 'SA in S&OP'.

It was decided to leverage the opportunity of having a panel of experts together on the subject of S&OP for the Delphi study, to gather some empirical data in support of a potential future research topic investigating the role of IT in supporting 'SA in S&OP'.

In round 1 a number of questions were positioned to extract the experiences of the expert panel in this regard. Table A4.1 shows the quantitative response profile when questioned about the importance of IT tools/applications and the role of data analytic capabilities in particular.

Table A4.1: Quantitative Response profile on practice and importance of data analytics in support of 'SA in S&OP' (Round 1)

Survey Question No.	Focus of Question	Results	Research Objective
Q20	Importance of IT Tools / Applications for 'SA in S&OP'	100% viewed it important (7% as extremely important, 53% as very important and 40% as moderately important	Baseline feedback for future research into role of IT in S&OP.
Q21	Level of IT data analytics capability typically deployed	80% saw Diagnostic Analytics 67% saw Descriptive Analytics 53% saw Predictive Analytics 40% saw Prescriptive Analytics	Baseline feedback for future research into role of IT in S&OP.
Q22	How important each data analytics element is for SA in S&OP	When considering what was essential: 73% - Predictive Analytics 71% - Diagnostic Analytics 60% - Prescriptive Analytics 29% - Descriptive Analytics	Baseline feedback for future research into role of IT in S&OP.

The indication from Q20 showed that the expert panel considered that IT tools/applications played an important role but the level of importance attributed to it was mixed.

Diagnostic analytics was seen to be most prominent in practice today (Q21), in order to support 'SA in S&OP' a shift is required to make predictive analytics more prominent (Q22).

A couple of qualitative questions (Q20a & Q20b) afforded the respondents the opportunity to indicate what type of tools might be relevant when it comes to supporting the enablement of 'SA in S&OP'. Figure A4.1 shows the profile of the responses following the qualitative analysis supported by the NVIVO tool.

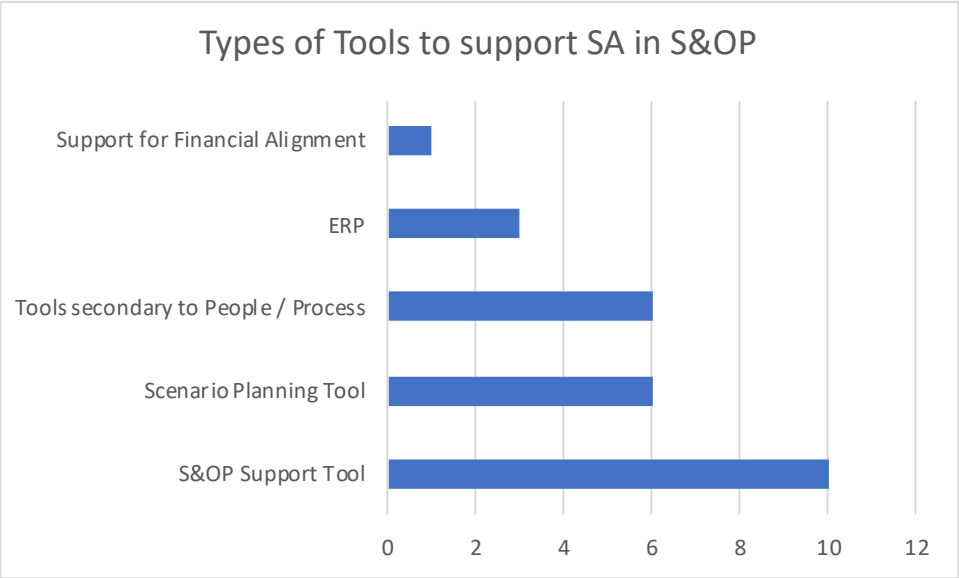


Figure A4.1: Results of qualitative analysis on comments related to use of tools

The responses grouped into logical categories in Figure A4.1, were not very specific and questions were designed to investigate further in round 2.

Interestingly, a number of comments indicated that tools were not an essential ingredient for SA in particular, even though they may have a role in S&OP in general:

- *"I believe that IT tools are not a critical success factor"* - CT1.
- *"For the SA process as such, I only see a moderate need for IT tools as it is more about getting the rights facts to the discussion table, with the right participants, in the right time"* - PF4.

In round 2 of the Delphi study further questions were positioned based on the round 1 responses. There was a mixture of closed selection questions as well as open qualitative questions. Table A4.2 shows the profile of responses to the quantitative questions.

Table A4.2: Quantitative Response profile on questions related to role of IT in support of 'SA in S&OP' (Round 2)

Survey Question No.	Focus of Question	Results	Research Objective
Q37	Ranking of importance of where software tools can help SA	Spread of responses – see Figure A4.2.	Baseline feedback for future research into role of IT in S&OP.
Q39	Perspective of whether decision makers trust the use of support software when it comes to enabling SA	29% strongly agreed 43% somewhat agreed 7% neither agreed or disagreed 21% somewhat disagreed	Baseline feedback for future research into role of IT in S&OP.
Q40	Whether the role of software is likely to become more or less important going forward	71% selected more important 22% selected about the same 7% selected less important	Baseline feedback for future research into role of IT in S&OP.

The ranking of areas related to 'SA in S&OP' where software tools would support (Q37), delivered a profile of responses as shown in Figure A4.2:

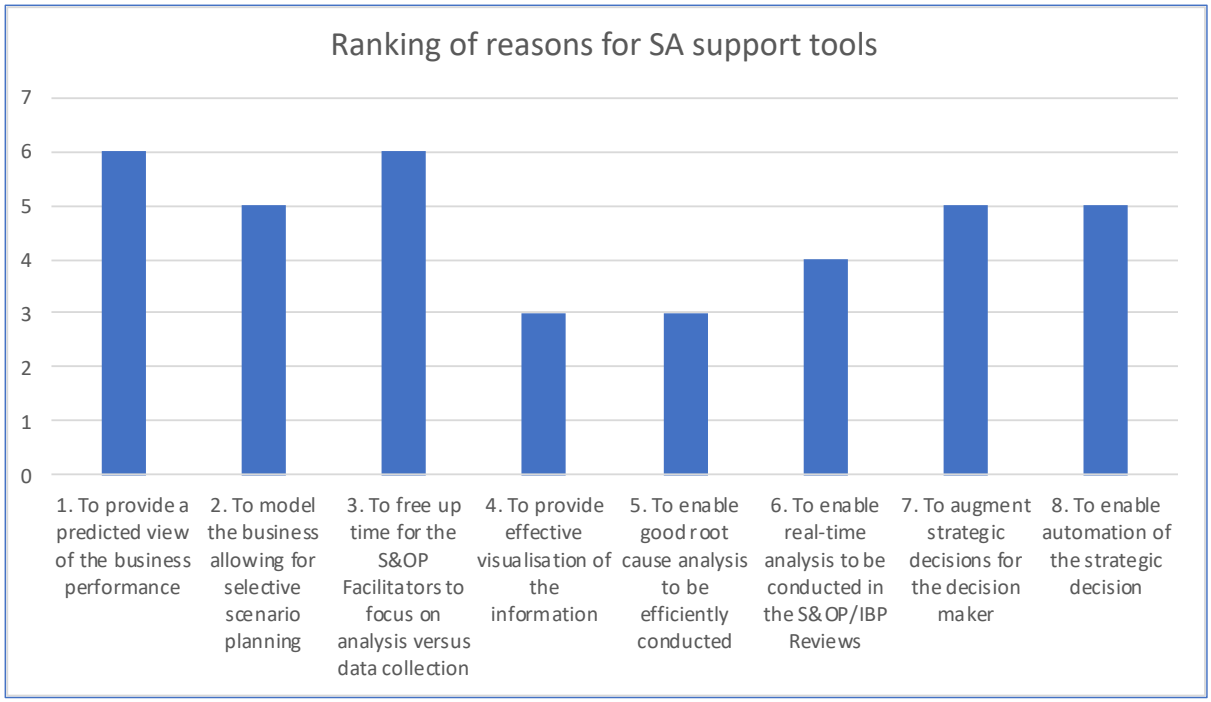


Figure A4.2: Profile of relative importance on use of software tools in support of SA

43% of respondents ranked 'To provide a predicted view of the business performance' as No.1 priority for providing software tool support (Q37). The second ranking according to 36% of the respondents was having the capability to model for scenarios. The third ranking was to be more efficient and free up the time for the facilitators to focus on analysis. Across the range of ranking, interestingly the lowest two rankings related to either augmenting (rank 7) or fully automating (rank 8) decision making. The findings provide a platform to further investigate how much IT support tools are likely to be embraced when it comes to making longer-term strategic decisions, which by their nature, can have a big impact on the business.

When given the opportunity to specify any other reasons (Q38), 3 respondents pointed to supporting standardised data presentation and 1 respondent pointed to data accuracy.

When it comes to trusting decision support software for enabling 'SA in S&OP', the spread profile of responses (Q39) would indicate that some deeper analysis would need to be conducted into this important topic. In particular with three respondents selecting the 'somewhat disagree' option, further investigation is required to understand how decision makers view the role of decision support software. Having said that the 'Decision Makers' category of respondents all selected either 'somewhat agree' (5 respondents) or 'strongly agree' (3 respondents). The 'somewhat disagree' category was selected by the consultants (2 respondents) and one of the process facilitator roles. It is maybe a surprising finding for the

decision makers to indicate that they would trust using decision support software but maybe the perspective of consultants and facilitator are providing a more realistic experience? This is an area worth investigating further as part of future research.

Turning to the future, while 71% of the respondents expected software to play a bigger role in the future, when asked to provide reasons for their selection, the qualitative analysis provided a profile of reasons. Figure A4.3 shows the profile of feedback showing 9 respondents providing reasons why software will play a bigger role and 4 respondents who did not see software playing a bigger role.

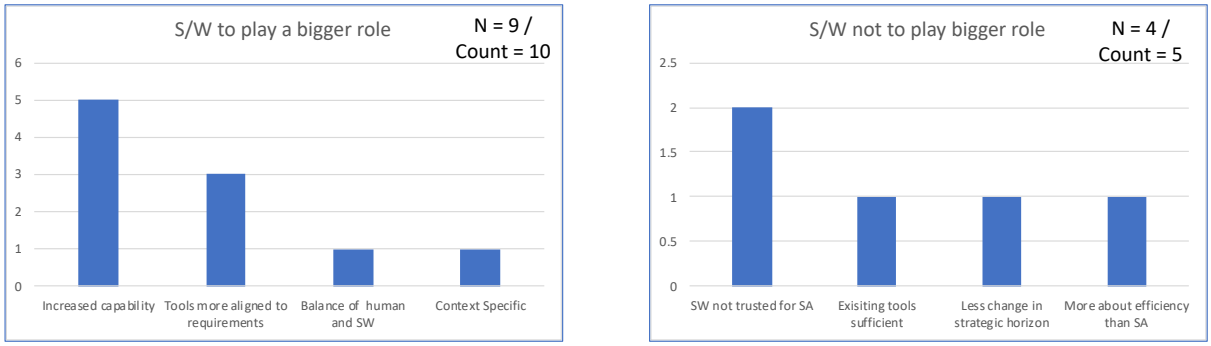


Figure A4.3: Profile of reasons why software would play a bigger role and why it would not play a bigger role, in terms of 'SA in S&OP' going forward.

The votes for software playing a bigger role focused on the increasing capability of software tools and those tools being more aligned to the business requirements. However, on the perspective of tools not playing a bigger role, the spread of qualitative feedback related to software not being trusted specifically for SA, current tools being sufficient, less need for tools in the strategic horizon and tools being more focused on efficiency rather than SA.

This base data and preliminary analysis, provided in rounds 1 and 2, related to the role of Information Technology (IT) in support of 'SA in S&OP'. It provides a base data set to support a more in depth research study specifically into this topic.

Appendix 6.1: Research Protocol for Case Study

CASE STUDY PROTOCOL

Revision History

Rev1.0 (Jan'23): Planned approach to single case study.

Rev2.0 (Feb'23): Adjusted after pre-meeting with target case study company to obtain context information

Rev3.0 (Mar'23): Final tidy up of RQs and Propositions to ensure focus on developing explanatory evidence. Include observations of strategic discussions as well as strategic decisions being made as indicators of SA being achieved. Some restructuring of the protocol document. Validation section added.

Strategic Alignment (SA) in Sales & Operations Planning (S&OP)

Introduction

The purpose of this protocol is to guide the researcher during the case study. The protocol is designed to optimise the data gathered in support of the case study questions and avoid the study drifting into areas that may be interesting but beyond the scope of the investigation. The document is revision controlled in recognition that, based on the findings during the case study, there may be a requirement to adjust the protocol if it is deemed appropriate and beneficial to answering the case study questions. The format of the protocol document follows the structure recommended by Yin (2009).

Objective

The conceptual framework as shown in Figure 1 and the assumed positioning of S&OP in the planning hierarchy, as shown in Figure 2, provide the starting point for the case study investigation. The objective is to determine how relevant the frameworks are in the real-world when it comes to enabling strategic alignment in support of strategic decision making in S&OP.

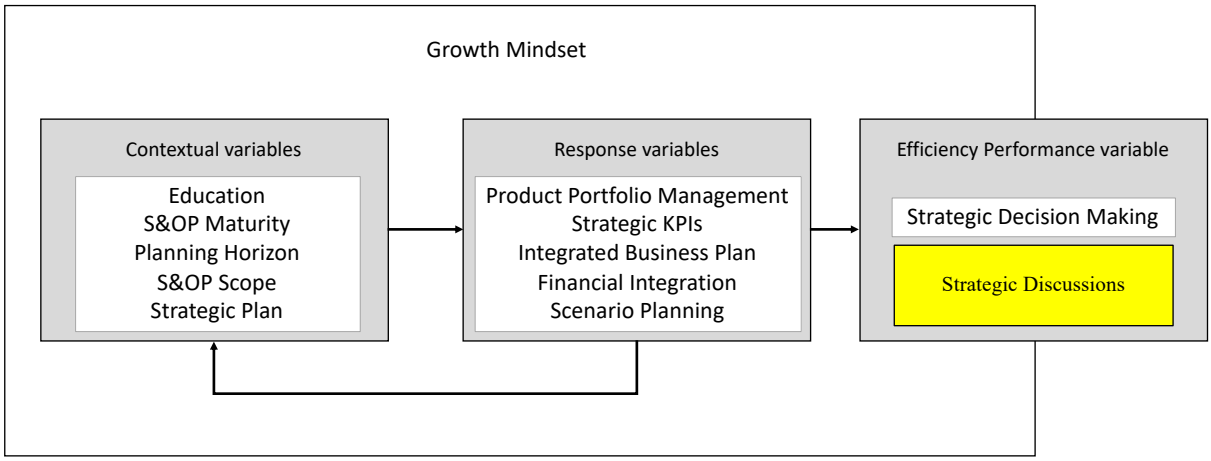


Figure 1 : Conceptual Framework for Strategic Alignment in Sales & Operations Planning

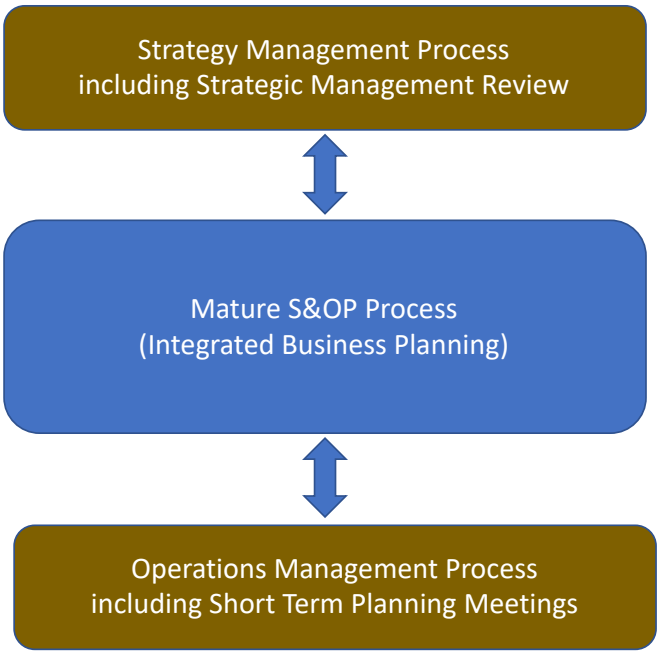


Figure 2: S&OP process positioned in planning hierarchy in support of 'SA in S&OP'

The frameworks as shown in Figure 1 and Figure 2, emerged following an Integrative Literature Review (ILR) and a Delphi field study of known experts. With the requirement to have a level of maturity in the S&OP process to build the capability for SA (Danese et al., 2018), the case study selection is focused on a company who are acknowledged as having a mature process. A mature S&OP process is often referred to as Integrated Business Planning (IBP) in practice (Tohamy, 2008). This is the situation for this single case study company.

Hence the term IBP will be used when referencing the process in this case study protocol. A single case study was selected falling under the *intensity sampling* strategy outlined by Patton (2002b), where a rich example of the phenomenon can be investigated. The phenomenon of 'SA in S&OP'/IBP is acknowledged in the practitioner literature as being rare (Alexander, 2013, Turner, 2018) and so the sourcing of this single case affords a unique research opportunity.

The Research Questions (RQs) that are driving the case study investigation are as follows:

RQ1: To what extent does the evidence, from an investigation of an exemplar case study, support the constructs and relationships as defined by CF3.

RQ1 is supported by a number of research propositions (RPs) to be explored through the case study investigation, as follows:

⇒ RP1: The implementation of the defined set of contingency variables have a direct influence on the enabling role of the set of response variables in achieving 'SA in S&OP'.

⇒ RP2: The capability of the response variable processes, to achieve 'SA in S&OP', is achieved through maintaining a closed loop feedback to the contingency variables, in order to ensure a fit is maintained between the contingency and response variables.

⇒ RP3: The capability of the response variable processes, in achieving 'SA in S&OP' is demonstrated by a growth mindset in the organisation directly involved in the S&OP process.

⇒ RP4: The presence of strategic decision making is a clear indicator that SA is achieved in S&OP.

The second RQ relates to the positioning of S&OP in the planning hierarchy:

RQ2: How does the positioning of S&OP in the planning hierarchy affect the enablement of 'SA in S&OP', as evidenced when investigating an exemplar case study?

The associated research proposition to be explored in the case study investigation is shown below:

⇒ RP5: The positioning of the S&OP process in the planning hierarchy with two-way linkages to the strategic and operational planning levels is an enabler to achieving 'SA in S&OP'.

The case study questions focus on building an understanding of the triggers and enablers to the strategic discussions that are observed through attending the IBP review meetings. Also, to evaluate whether strategic discussions lead to strategic decisions being made. Finally an evaluation of the importance of IBP being positioned within the overall planning hierarchy is to be determined and if deemed to be important then how the linkages to strategic planning and operational planning actually work.

The answers to these questions will be interpreted from the analysis of the data, collected using the various methods as outlined later in this document. In answering the questions comparisons will be made against the frameworks shown in Figure 1 and Figure 2. The conclusions from the analysis will potentially confirm the structure of the frameworks or challenge specific elements. In addition new aspects of the framework may emerge from the analysis. This could take the form of adjusting the construct of one or other of the frameworks or providing detail to better inform the description of given elements within the existing frameworks.

The Unit Of Analysis (UOA) for the case study is the IBP organisation within the case study company. An embedded UOA will be the individual reviews within the IBP process to determine if SA is more prominent or relevant to particular reviews versus others.

Data Collection Procedures

The primary data collection will be via the researcher non-participatory observations while attending each of the IBP reviews at the case study company over 3 monthly cycles. The monthly cycle of the case study company is shown in Figure 3:

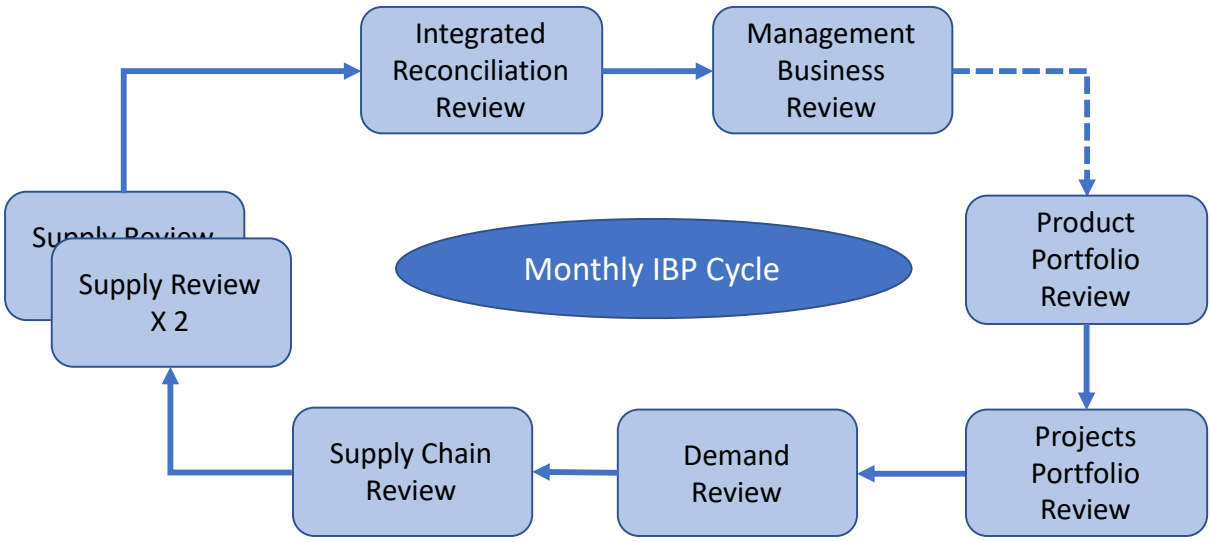


Figure 3: Monthly IBP cycle of the Case Study Company

Hence a total of 24 review meetings (8 reviews X 3 cycles) will be observed over the course of the study. Data collection templates will be used and will be triggered by any discussions observed in the review meetings that is deemed to be strategic in nature (as per research definition). Once triggered, then as much data as possible will be recorded in the template in an attempt to ascertain the key factors that enabled such strategic discussions to occur. In so doing a *pattern-matching logic* will be applied to draw parallels with the conceptual framework, as outlined by Ridder (2017) when performing case study research, where theoretical frameworks and research propositions are available – known as "*Gaps and Holes"* case study research design (Ridder, 2017, p287).

In addition to the data collection from the non-participatory observations, key informants will be identified for follow-up interviews based on their role in the strategic discussions observed. This will enable a more rich background to be investigated as to the conditions that enabled such discussions to occur. Other informants will be selected for interview based on their unique role and perspective on the research topic (e.g.:- Managing Director of the business unit).

As part of the triangulation process, the documentation packs that are created to support the review meetings will also be made available to the researcher and will form a key component of the data to be analysed.

In advance of the first review meeting, as much contextual data as possible will be gathered to help inform the researcher and support a more efficient process when the interviews are being subsequently conducted. This will take the form of company overview presentations, strategic plans, company values and any related documentation.

Following the experience of operating during the global pandemic, the IBP review meetings at the case study company were moved to virtual, utilising the Zoom video conferencing tool. Post pandemic the company operates a hybrid work environment and IBP review meetings continue to be held virtually. Therefore, the researcher will attend the review meetings via the virtual platform.

Case Study Database

A database will be used to provide a structure to the data that will be gathered and subsequently analysed. This database will grow and change as information is obtained and knowledge built through the iterations of the reviews being observed and interviews conducted. An outline of the expected database structure is shown in Figure 4:

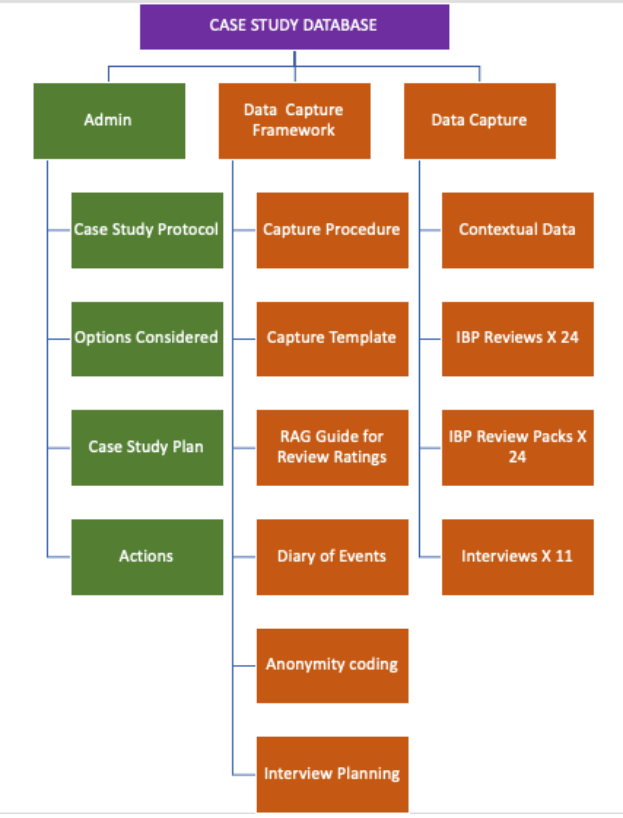


Figure 4: Outline of Case Study database

Data Analysis

A structured data analysis process will be followed based on what is outlined by Stake (1995):

- *Review raw data under various possible interpretations.*
- *Search for patterns of data.*
- *Seek linkages between program arrangements, activities, and outcomes.*
- *Draw tentative conclusions, organize according to issues, organize final report.*
- *Review data, gather new data, deliberately seek disconfirmation of findings.*

Once patterns are recognised related to SA activities then linkages will be sought to the CF3 structure and content and recorded. Combined with the interviews with key informants and the analysis of the presentation information packs, conclusions related to key findings will be made, supported by the evidence gathered. Before conclusions are drawn a list of potential rival explanations will be documented and if discounted the evidence to support same will be captured.

As part of the database structure a set "Data Capture" and "Data Analysis" excel files were maintained with multiple tabs to reflect the full scope of the case study process followed, as per the research protocol. These included guidelines for the data capture and analysis.

Validation

Four social science tests, as outlined by Yin (2009), will be deployed for ascertaining the trustworthiness of the findings and associated conclusions. These are:

- Construct validity
- Internal validity
- External validity
- Reliability

Construct validation will be supported by triangulating evidence from the reviews observed, the interviews conducted and the review information packs analysed. Internal validity will be addressed through leveraging a pattern-matching approach to any observations recorded as being relevant to the research propositions. Also, rival explanations will be continually

sought before conclusions are made. With this being a single case study, the context prevents generalisation claims across other businesses. However, the theories applied to provide perspective to the conceptual framework, will be leveraged to determine their relevance to explaining how to go about achieving 'SA in S&OP' beyond the single case. This approach will support external validity. In terms of reliability, having the case study protocol, explaining in detail the steps taken and having a structured database will be essential elements to support replication integrity.

Outline of Case Study Report

On conclusion of the case study analysis a report will be generated and presented to the case study company. The objective of the report will be to validate the key findings by affording the case study company the opportunity to review and challenge the findings. In order to resonate with the company the findings will be presented using practitioner language where possible.

The report will focus on the construct and content of the updated conceptual framework. The plan would be to review with the IBP process leader(s) initially to receive initial feedback before presenting to the leadership team of the case study company.

Appendix 6.2: Diary of key events during Case Study

Date	Activity	Review Cycle	I/View No.	Event
13-Feb-23	Call with IBP Process Leader			Meeting
20-Feb-23	Call with IBP Process Leader			Meeting
23-Feb-23	Call with deputy IBP process Leader (leader on leave for 5 weeks)			Meeting
02-Mar-23	Product Review (March cycle)	1		Review
10-Mar-23	Suply Chain Review (March cycle)	1		Review
14-Mar-23	Projects Review (March cycle)	1		Review
21-Mar-23	Demand Review (March cycle)	1		Review
22-Mar-23	SP Supply Review (March cycle)	1		Review
24-Mar-23	MP Supply Review (March cycle)	1		Review
27-Mar-23	IR Review (March cycle)	1		Review
30-Mar-23	MBR (March cycle)	1		Review
06-Apr-23	Product Review (April cycle)	2		Review
11-Apr-23	Projects Review (April cycle)	2		Review
13-Apr-23	Suply Chain Review (April cycle)	2		Review
18-Apr-23	Demand Review (April cycle)	2		Review
18-Apr-23	Interview 1 (PROFIN1)		1	Interview
25-Apr-23	Interview 2/3 (IBPLED1 & IBPLED2)		2-3	Interview
26-Apr-23	SP Supply Review (April cycle)	2		Review
27-Apr-23	MP Supply Review (April cycle)	2		Review
28-Apr-23	Interview 4 (PROFAC1)		4	Interview
02-May-23	IR Review (April cycle)	2		Review
03-May-23	MBR (April cycle)	2		Review
04-May-23	Product Review (May cycle)	2		Review
05-May-23	Interview 5/6 (DEMFAC1 / DEMFAC2)		5-6	Interview
09-May-23	Projects Review (May cycle)	2		Review
09-May-23	Interview 7 (SLTCHA1)		7	Interview
16-May-23	Demand Review (May cycle)	3		Review
16-May-23	Interview 8 (PROCHA1)		8	Interview
18-May-23	Interview 9 (MBOSUP3)		9	Interview
22-May-22	Interview 10 (MBOCHA1)		10	Interview
24-May-23	SP Supply Review (May cycle)	3		Review
25-May-23	MP Supply Review (May cycle)	3		Review
29-May-23	IR Review (May cycle)	3		Review
29-May-23	Interview (SLTQAL1)		11	Interview
30-May-23	Issue preliminary report			Report1
31-May-23	MBR (May cycle)	3		Review
31-May-23	Initial Feedback from SLT			Feedback
01-Jun-23	Product Review (June cycle)	3		Review
13-Jun-23	Projects Review (June cycle)	3		Review
30-Jun-23	Issue full report			Report2
24-Jul-23	Review of key research findings with IBP Process Leaders			Feedback

Appendix 6.3: Data Capture File Example (For illustrative purposes – Steriles Supply Review March 2023)

Appendix 6.4: 'SA in Action' Observations during Case Study

No.	SA in Action' Observation	KI No.	Rank	Key Insight	Supporting Evidence	Interpretation to CF	Review Pack Reference	SA Discussion / Missed Discussion / Decision / Missed Decision	Review	Cycle
10	Discussion on volume fluctuations in 2025 that look to have an impact on the key strategic target of Cost/unit. However, MBOFIN1 viewed that latest volumes were not correct and a pending update to the Strat plan would fix them. Resulted in no action being taken for now and no real discussion on same.	5	1	5. Lack of team trust in the data or presenter will inhibit SA discussions	Cost/unit reviewed by finance for 2023 - favourable - SP23 and SP24 presented for cost/unit targets - "Expect completely different volumes in new Strat Plan - higher volumes will bring cost down" - MBOFIN1. So can't make any decisions based on cost charts beyond this years budget.(26 of 56)	Lack of trust in the data will inhibit the ability of the team to have a growth mindset.	26 of 56	Missed Discussion	MP-Supply Point Review	1
13	When QAL presented their capacity data, the reaction of the team was to question the efficacy of the data and challenge around lack of clarity on actions to resolve the projected overload, which was significant in some cases.	5	1	5. Lack of team trust in the data or presenter will inhibit SA discussions	QC Chemistry release showing consistent over capacity - over loaded up to 130%/ 160% into 2024 - request for additional headcount as well as other improvements - MBOQAL4. Question on whether restesting is built in - answer is that it is - suggested by MBOPRJ1 to include it as a working assumption in terms of what % over time assumed for retesting. Also issue in QC Micro - No escalation listed but agreed by team that should be. Challenge from IBPLED2 on big change month on month - MBOQAL4 had to acknowledge that the model is really still under	Lack of trust in the presenter or the data will block SA focus, discussions and decisions - affects the collective Growth Mindset,	47-49 of 56	Missed Discussion	MP-Supply Point Review	1
16	The team response when QAL presented reflected a lack of trust in either the presenter or their data. Multiple challenges as a resultand the discussion degraded to being process discussions as opposed to actions from the information presented. This caused SA discussions to be missed.	5	1	5. Lack of team trust in the data or presenter will inhibit SA discussions	QAL have real issues but not even send someone with clear action plan following MBO review strong feedback - suggests a lack of accountability. IRRFIN2 - "Seems like only action is to add H/C?".	Lack of trust in the presenter or the data will block SA focus, discussions and decisions	43-49 of 71	Missed Discussion	IR Review	1
19	Presentation from QAL function was immediately received with challenges from SLTCHA1 + otehrs that clealry showed there was no trust in the data being presented.	5	1	5. Lack of team trust in the data or presenter will inhibit SA discussions	"Not get sense that plans are realistic - trying to keep volume in main mfg but not matched in inspection and QC in general. Could QC/QA "cross pollinate"? - another subtle challenge from SLTCHA1.	Lack of trust in the presenter or the data will block SA focus, discussions and decisions	32-35 of 53	Missed Discussion	MBR	1
23	QC Micro function immediately dis-empower the team discussion opportunity by stating that data may be incorrect. Not a major reaction - maybe due to fact that capacity projection in 2025 at 85%?	5	1	5. Lack of team trust in the data or presenter will inhibit SA discussions	QC Micro - start by saying "need to check the capacity data" - that is showing 120% (2023) and 107% in 2024 loading - disempoweres the team from challenging. "Can we have a plan to address the red areas over the years and review in next months review?" - SPOCHA2. Link to previous review to remind QAL of the actions under way to review QAL capacity charts - SPOSUP2	Lack of trust in the presenter or the data will block SA focus, discussions and decisions	39-49 of 67	Missed Discussion	SP-Supply Point Review	2
26	The presentation of capacity loading data by the QAL team drove an immediate reaction across the team of challenging of the numbers and the process to generate the graphs.	5	1	5. Lack of team trust in the data or presenter will inhibit SA discussions	No confidence in the data being presented by QAL team. "I don't understand the graphs and how we are doing this" - MBOCHA1. "Why is AI QA Cap still showing 147% loading even after adding in headcount?" - IBPLED2.	Lack of trust in the presenter or the data will block SA focus, discussions and decisions	43-47 of 82	Missed Discussion	MP-Supply Point Review	2
29	QAL function unable to answer questions on how confident they are on projections based on actions being taken. Caused discussion to switch to a process discussion and acknowledement that QAL function need help to engage the process effectively.	5	1	5. Lack of team trust in the data or presenter will inhibit SA discussions	Key assumption from QC Chem that failure rate to decrease from 20% to 10% - 'new methods being deployed so expect to kick in in 2024" - IRRQAL1. QAL rep not have the required information to answer the challenging questions from IBPLED1 - key actions to be taken but not abale to engage it properly.	Team Growth Mindset required	39 of 58	Missed Discussion	IR Review	2
33	Even though QC presentation has more information on what actions were being taken to improve projections outlook, the charts did not show the impact of actions and when problem would be solved, prompting challenges and a level of frustration from the team, especially SLTCHA1.	5	1	5. Lack of team trust in the data or presenter will inhibit SA discussions	QC Chemistry (MB) remains an issue. Good explanation as to why at 107%/112% and 110% next 3 years. Challenged by SLTMFG2 as to how can improve - answer is based on efficiency improvement programs to kick in next year (standard work) - not factored in because only at feasability/pilot stage so no demonstrated performance. "May be operate two machines with one person." - DELQAL1. Action taken to build sceanrios / glide paths for all QC areas - "We have red everywhere" - SLTCHA1	Lack of trust in the presenter or the data will block SA focus, discussions and decisions	37 of 57	Missed Discussion	MBR	2
45	MBOCHA1, while being very professional, indicated that an email had been sent in advance of meeting and then articualted the key concerns with what the QAL organisation were presenting.	5	1	5. Lack of team trust in the data or presenter will inhibit SA discussions	QC Chemistry - Projections showing red (32 of 51) - MBOQAL4; "Can see the over capacity projections - gives me concern. Can see thr actions - look reasonable but have no idea how much impact they will have on the capacity charts - not qualified to challenge - need to see the commit connecting the actions to a revised caapcity projection" - MBOCHA1. "Escalations: N/A". "We could be sleep walking into a disaster" - MBOCHA1. Same with QA AI (34 of 51). "Aggressive reponses from MBOQAL3 - clearly not happy with H/C freeze - frustration very clear". Consumed a lot of time - MBOQAL3 very defensive. Same story with QP AI caapcity projection (36 of 51) showing 200% in 2025 with not tangible way to address. "there are some ideas on how to address 2024/2025" - MBOQAL3, but not included in the slide - IBPLED1 - "Why did we not include this in thr slides". Indications lack of education / understanding of IBP expectations. MBOQAL 1 presented PFS QA caapcity (37 of 51)- same issue to address 153% in 2024 ?	Need at least 2nd order capability as part of 'Growth Mindset'	32-36 of 51	Missed Discussion	MP-Supply Point Review	3
48	Responsible lead for QAL was not present at the review to talk to slides that showed a projected issue. Resulted in taking the issue offline and missing out on a key business discussion and potentially key decisions that needed to be made.	5	1	5. Lack of team trust in the data or presenter will inhibit SA discussions	QAL - Slides 40-43 of 60 not covered as not have QAL lead required and running over in time - "Need to link offline with QAL lead - IBPLED2. Prevents a required discussion on projected over caapcities in 2024 and 2025 in QC Micro, QA AI, QP AI, PFS QA all of which are projected to be over capacity.	Growth Mindset impacted if one function not on board => SA missed opportunities.	40-43 of 60	Missed Discussion	IR Review	3
49	An opportunity to assess key future risks using a templated Risk Register was missed due to a challenge from SLTCHA1 on how risk profiles had changed month to month with conclusion that it was too subjective and needed to be reviewed.	5	1	5. Lack of team trust in the data or presenter will inhibit SA discussions	Review of high level risk register provided a lens into major risks against the strategic drive of the business (17 of 61). However, a few challenges from SLTCHA1 on the positioning of risks on the matrix by SLTQAL drove an extended discussion on how objective the ratings were in reality and SLTSMS1 was actioned to review to ensure it was more formulaic and transparent.	Lack of trust in data prevents SA discussion	17 of 61	Missed Discussion	MBR	3
52	Quality function had made a big effort to provide more concrete actions to address future projection issues on QC capacity. However, still not able to link the actions to projected impact and understand what needs to be done to get back on track so SLT team triggred into process challenges again.	5	1	5. Lack of team trust in the data or presenter will inhibit SA discussions	QC Chemistry Release and Stability charts showing over capacity through to 2025 at 108%/115%/107%. Drove challenges again around the data. "How can this be, when we are not missing releases?" - SLTSMS1. "Should the strategic target for this activity really be 95%?"-SLTCHA1. "We have enough demonstarted perfromance data now to relook at this" - SLTSMS1. "Productivity improvements not factored in yet" - SLTQAL1. So essentially a process discussion ensues missing the business discussion required on whether have a projected issue or not.	Trust is an essential element to achieve growth mindset capability	41 of 61	Missed Discussion	MBR	3

No.	SA in Action' Observation	KI No.	Rank	Key Insight	Supporting Evidence	Interpretation to CF	Review Pack Reference	SA Discussion / Missed Discussion / Decision / Missed Decision SA Achieved	Review	Cycle
5	Knowledge on planned changes to startegic inventory holding on key products (strategic KPI) drove analaysis and discussions on the impact to -35 degree freezer capacity in the warehouse.	3	2	3. Reviewing performance relative to strategic KPIs can trigger SA discussions and/or decisions	Cold Chain capacity out to end of 2025 - issues highlighted for 2024/2025 - "Need a guide for the Strat Plan" - SUPCHA1. Need a sceanaio - take the "rental spacae" units out - how much MB and SP products can store. "Need to see scenario in April" - SUPCHA1. Ambient showing out to end 2024. In risk space but tender process in place to increase capacity - chart showing new capacity solves problem.	Importance of Strategic KPIs	35-38 of 64	SA Discussion	Supply Chain	1
15	"Top down" changes to the strategic plan targets or initiatives required a review of the "bottom up" plan to drive alignment.	3	2	3. Reviewing performance relative to strategic KPIs can trigger SA discussions and/or decisions	Impact to SP challenged by IRRPMO1 "With headcount freeze, we will need to assess the impact to future programmes". Also IBPLED2 highlighted that CBNs might have to be revisited based on H/C freeze - "Once finalise volumes then need to test relative to CBNs to see if still valid",	Importance of the visibility of the strategic plan for SA.	14-16 of 71	SA Discussion	IR Review	1
22	Review of the planned caapcity loading for LYP, showing over startegic target of 85% but under 100%. Dsicussion ensued about managing the risk for now versus taking action to see if load changes.	3	2	3. Reviewing performance relative to strategic KPIs can trigger SA discussions and/or decisions	opportunities to bring it down. Problem continues into 2024 and comes down in 2025. Discussion on how to address capacity in 2024 due to demonstrated performance of lost fills. "Hate living on plans that show 90%+ capacity loading - give it another couple of months and then need to make a decision on how address 2024" - SPOCHA2." Will require escalation through GSC" - SPOFAC1.	Importance of Strategic KPIs	14-15 of 67	SA Discussion	SP-Supply Point Review	2
25	Despite the opportunity of extra volume, the team reinforced the requirement to meet the strategic KPI capacity loading target of 85% maximum and so may have to decline extra capacity.	3	2	3. Reviewing performance relative to strategic KPIs can trigger SA discussions and/or decisions	External request for more Fills drove challenging discusion on whether would end up violating the strategic loading target of 85% Request for more fills KZ at end of 2023 - discussion between Chair and SC to say loaded at 86.9% (over the year) then should reject the request? Agreed to hold off on decision until further analysis can be done and scenario can be presented.	Importance of Strategic KPIs	25-26 of 82	SA Discussion	MP-Supply Point Review	2
27	When reviewing major changes to plan out through 2025, the team discussion provided clarity on "top down" changes to strategic targets (MOH for key products like Myo), enabling intelligence to be brought in prep for MBR.	3	2	3. Reviewing performance relative to strategic KPIs can trigger SA discussions and/or decisions	Team discussion on some volume changes in 2024 and 2025 get to collective understanding of reasons and justifiucation so that could be clear at the MBR. Corp strategic decisions to increase inventory on key products (eg:- My)	Importance of Strategic KPI Targets	24 of 58	SA Discussion	IR Review	2
32	The strategic target for capacity loading at 85% is taken seriously and triggered a discussion on re-balancing load on LYP.	3	2	3. Reviewing performance relative to strategic KPIs can trigger SA discussions and/or decisions	LY capacity in 2024 up at 96% - discussion to review with corproate how can move some volume out to 2025 to come more in line with strategic capacity loading target of 85%.SLTCHA1 to take action with SLTFIN1.	Importance of Strategic KPIs	28 of 57	SA Discussion	MBR	2
42	When reviewing the projected capacity picture for the LYP platform then the 2024 and 2025 collective picture prompted discussion on re-balancing load andf actions to review is this would be possible.	3	2	3. Reviewing performance relative to strategic KPIs can trigger SA discussions and/or decisions	SPOSUP2 - "Think we need to take some further action as 2024 is still overloaded - looking at 2025, then maybe we should consider moving some fills out to 2025 - in discussion with commercial to understand the impact". SPOCHA1: "We will deliver improved TAT based on CBN initiatives but it won't be enough so agree need to progress those actions". "Let's track all inititaives in here and projected impact" - SPOSUP2.	Importance of Strategic KPIs	16-17 of 65	SA Discussion	SP-Supply Point Review	3
6	Having preparared data to show the need for more storage, to avoid risk of exceeding strategic loading target of 85%, there was approval to proceed with the tender process.	3	2	3. Reviewing performance relative to strategic KPIs can trigger SA discussions and/or decisions	Warehouse capacity picture clearly presented for differing types of storage requirements out to 2025 to meet strategic target on 85% loading and redundancy on freezers. Specific project to proceed with tender for ambient warehouse storage to bring back in line with strategic target projection of 85% loading.	Importance of Strategic KPIs	32-33 of 64	SA Decision	Supply Chain	1
17	imperative of ensuring that there is an annual improvement in CRI (Cost/unit) as a strategic driver, drove discussions on how to increase volume in 2024/2025 to offset costs, including potentially bringing in volume that was outsourced.	3	2	3. Reviewing performance relative to strategic KPIs can trigger SA discussions and/or decisions	Key strategic financial KPI (Cost/unit) driving discussions of how to meet strategic plan MP&LP fills drop in 2024 and 2025 . " Need to get the 3M back in 2025 to meet SP"-SLTCHA1. "Also on LYP - have option to pull back in CMO vols if required - Don't need to make this decision yet - let's monitor for now" - SLTCHA1.	Importance of Strategic KPIs	6-7 of 53	SA Discussion	MBR	1
20	Clear capacity projection challenge presented and data to support the recommendation to create a project to purchase new chamber - strategic loading target of 85% clearly taken seriously to trigger actions.	3	2	3. Reviewing performance relative to strategic KPIs can trigger SA discussions and/or decisions	Actions triggered based on maintaining 85% caapcity strategic target into 2024 and 2025. Decision approved in MBR to form a project for introduction of new chamber - strategic project created. "New chamber will take 12-15 months so to address issue at back end of 2024 a decision needs to be made by May". Otherwise units have to be removed. "Significant cost associated with it so formal process underway" - SUPWHS1. Cold Chain (2 to 8) focus - "Created as separate project now"	Having strategic projects as part of scope is key to SA. Need strategic projects in order to achieve an integrated plan.	23-25 of 65	SA Decision	Supply Chain	2
12	Clear sceanrios presented to resolve capacity issue including projections for the future. After discussion, it was agreed that extra resources were required and should be escalated to the MBR for decision.	6	3	6. Scenarios and assumptions are a key enabler to SA discussions / decisions	Scenarios presented re: inspection capacity - MBOCHA1 directed it to go to MBR. Highlighted for escalation - decision requested for extra resources in 2023	Scenarios are a key enabler to SA to drive SDM	31-34 of 56	SA Discussion	MP-Supply Point Review	1
28	While focusing on the plan numbers, team recognised the typical perfromance of a key supplier of DS ingredient and so aligned around taking risk on planning above 85% strategic target based on likelihood of supply plan having to be decreased due to constrained supply of DS.	6	3	6. Scenarios and assumptions are a key enabler to SA discussions / decisions	Discussion arounnd V&Os associated with LY capacity plan - strategic timeline discussions. Capacity showing >90% but "based on demonstrated performance from DS sites, then will likely drop naturally so not concerend about 91%" - IRRSUP1 (30of58). Projections drove strategic alignment type discussion to make sure everyone OK with projections risk of remaiining in the "red" versus the strategic target of 85%.	Scenarios are a key enabler to SA	29-30 of 58	SA Discussion	IR Review	2
30	An assumption on a partner product delay triggered a response to provide intellignece that the assumption may in fact be incorrect.	6	3	6. Scenarios and assumptions are a key enabler to SA discussions / decisions	IBPLED1 highlighted the key assumptions to ensure SLT were all aligned with them - assumption on RX 22 delay wrt impact on volume builds for 2024 - Eng V Mfg V SLTCHA alignment challenge - "This assumption does not reflect what we have communicated to Corporate". "Need to have a dertailed review and make sure we are aligned for the Strat Plan" - SLTCHA1	Strategic assumptions are a key enabler to SA.	15 of 57	SA Discussion	MBR	2
31	An assumption about time allowance fro critical maintenance triggered a discussion around why it was not cosnsitent across platforms and whether there was an opportunity to get more capacity back for planning.	6	3	6. Scenarios and assumptions are a key enabler to SA discussions / decisions	Allowing 20hrs for critical path maintenance - generated discussion as to consistency between LY and MB - action to review with view to see if can reduce to free up capacity for longer term planning (15 of 57)	Strategic assumptions are a key enabler to SA.	15 of 57	SA Discussion	MBR	2
43	A slide that listed all the startegic assumptions, vulnerabilities and opportunities triggered a dicussions specifcally on whether the opportunity for mitigating actions in 2024 were sufficient.	6	3	6. Scenarios and assumptions are a key enabler to SA discussions / decisions	Label & Pack (All4) - Challenge on "opportunities" to address over capacity (102%) in 2024 from MBOCHA1 - Feedback from engineering would support a relookk to ensure are not missing actions to be taken.	Scanarios / Assumptions / V&Os are an essential element to engage the team capability.	21 of 51	SA Discussion	MP-Supply Point Review	3
47	Set of scenarios X 4, with assumptions, were created and discussed to be ready fro MBR with intent of triggering a decision in the MBR.	6	3	6. Scenarios and assumptions are a key enabler to SA discussions / decisions	Prep of sceaniors for MBR to enable decision on PFS Inspection capacity - 3 X Sceanrios presented (47-48 of 60) with recommendation on sceanrio 3. Assumptions also explicitly stated. 2024 issue to be addressed. Impact of not making a decision in terms of backlog clearly called out. Lot of cross functional discussion to make sure scenarios stand up and also to understand why it has come to this point - could this decision have been made sooner? Good push from IBPLED1 to make sure that have the clarity for SLT decision making because previously was presented and extra headcount had been rejected. Agree by team that are ready with the implications in particualr being important to understand. IRRCHA2 - "Cost of not getting the extra 4 headcount much greater than headcount cost itself - need to proceed or will have backlog on some key products". "To esnure decision gets made let's put a financial number of the impact of not supporting one of the sceanrios"-IBPLED2	Importance of scenarios when trying to trigger strategic decision making.	47-48 of 60	SA Discussion	IR Review	3
51	Sceanrios preparared in advance X 4 to faciltate a key decision to address caapcity cobncerns out through 2024. Financial implications included and led to brief discussion before decision was made.	6	3	6. Scenarios and assumptions are a key enabler to SA discussions / decisions	3 X Scenarios presented for capacity projection crunch on PFS Inspection. Recommendation on sceanrio 3 accepted (37 - 38 of 61). Financials of impact over time presented for each scenario which appeared to be a vital aspect, linking back to discussions in IRR when preparaing the scenarios. "Still on track to fully automate process for 2025 with corresponding reduction in 30 H/C?" - SLTCHA1 - Agreed. "Decision we have made to add 4 X people to inspection is fine but we need to still meet Strat Plan expectations on headcount overall" - SLTCHA1.	Importance of Scenarios as part of CF structure to enable Decision Making	37-38 of 61	SA Decision	MBR	3

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55	A presentation of a key assumption with respect to a dependency on an external site (ITY) prompted cross functinal discussion on how realistic the assumption was and recommendations to create scenarios around what was considered to be a vulnerability to the plan.	6	3	6. Scenarios and assumptions are a key enabler to SA discussions / decisions	Challenge on PPQs in Apr/May 2024 => 2 PPQs at the same time - "Will cause challenge form QC that is being reviewed"- PROTEC3. "Is this a realistic plan based on ITY dependence on doing their PPQs?" - IBDLED1. LEad to cross functional discussion with agreement that it is a "Vulnerability" and needs to be carefully monitored. PROSUP1 - "Also note that any slippage to this plan will result in extra commercial fills and we are already over capacity goal of 85% and looking to move fills out of 2024". Good discussions to bring intellignece ot bear across functions and will monitor as a vulnerability (17 of 53).	Scenarios are a key enabler to SA	16-24 of 53	SA Discussion	Product	3(4)
57	A review of the overall risk register provided another lens into the project portfolio and triggered discussions on relative positioning based on intelligence provided by the team.	6	3	6. Scenarios and assumptions are a key enabler to SA discussions / decisions	Risk Register reviewed - discussion to re-position key risk due to electrical component supply from "under control" to "not satisfactory / high risk" - PRJCHA1. Team discussion and agree to re-position (17 of 45).	Assessing sceanrios using the risk register supports SA discussions	17 of 45	SA Discussion	Projects	3(4)
1	Changes to product roadmap triggered SA discussions to understand implications across integrated plans (eg:- finance) and potential impact to the strategic plan.	1	4	1. Product/Project Roadmap Changes can trigger SA discussions to ensure alignment across functions	Plans for clinical builds in 2024 that look to be at risk based on latest updates on clinical studies progress (ASM-ICB). Concluded that a 12 month delay is inevitable. Challenge from finance to understand financial implications - agreed to close out in April cycle. "PPQs Planned for Q3 2023 potential move by 12 months (based on EU/FDA feedback on request for clinical trial data to support dossier submission".	Strategic Plan Changes driving response from Product Portfolio and Integrated Plan / Finiacial integration	6 of 41	SA Discussion	Product	1
3	The mis-alignment of a strategic partner due to performance issues, meant that the strategic plan would need to change and it triggered a discussion to understand alignment implications across all functions.	1	4	1. Product/Project Roadmap Changes can trigger SA discussions to ensure alignment across functions	2023/2024 discussions on planned new builds for clinical / commercial - general discussions on changes to the roadmap (eg:- RX - potentially out by 10 months). "Strat plan coming up in the next few weeks - need to understand the implications" (FINPAR1). Challenge on decisions to be made - taken as actions. Also operational challenges to other component builds - syringes (TECPAR4).	Link to Strategic Planning Process	15-16 of 41	SA Discussion	Product	1
21	An update on a project that looks to be approved that will move final assembly activities into a key market, drove a discussion on actions required to ensure a revised integrated plan.	1	4	1. Product/Project Roadmap Changes can trigger SA discussions to ensure alignment across functions	Review of new market shipping formats - repacking of 4-Zy products in China - could be big cost saving for the company - corporate strategy alignment (30 of 66). "Looks like this project is going to be approved - will need all functions to understand the implications and align accordingly" - DEMCHA1	Adjustments to the strategic Plan drive Integrated Plan activities to ensure alignment.	30 of 66	SA Discussion	Demand Review	2
37	Timing of review aligned with finalising of the annual update to the Strat Plan. Longer term view was taken to ensure have visibility of prioritised projects aligned to the site strategy.	1	4	1. Product/Project Roadmap Changes can trigger SA discussions to ensure alignment across functions	Strat Plan 2025-2029 presented on key projects: "Expect that any final aligment actions with corporate will be complete this month - challenges still outstanding on Opex" - PRJCHA1. Some projects have been removed where there was viewed that there was not a strategic driver for them.(37 of 48). Discussion on projects and how strategic they will be and have to prioritise projects to deliver on CBN direction.	Strategic Plan drives longer term focus	37 of 48	SA Discussion	Projects	2(3)
53	Discussion around Product Roadmap changes that had to be taken and would be approved by Corproate. Triggered other functions to highlight other implications with acknowledgement that there was plenty of time to address.	1	4	1. Product/Project Roadmap Changes can trigger SA discussions to ensure alignment across functions	Key updates against each platform provided by PROCHA1 as first agenda item (7 of 53). Triggered discussion providing other intelligence to be considered. "DX 2nd source - has implications to specific stopper testing required but we can plan that in" - PROPRJ1. "Key change is to remove PL RX from the roadmap - has been aligned with IPL"- PROCHA1. Shows changes to Strat plan being aligned with Corproate and relfected in the Product Plan. "Any key factors to be considered in the MBO Ops review based on these updates?" - IBPLED1. "No - handled as part of pilot lines within Product" - SLTCHA1.	Importance of Strategic Plan and Product Roadmap	7 of 53	SA Discussion	Product	3(4)
56	Updated plan from Strategic Projects prompted some mis-alignment discussions and actions taken to ensure Product and Projects plans were aligned.	1	4	1. Product/Project Roadmap Changes can trigger SA discussions to ensure alignment across functions	Strong tie in with Strategic Projects and so review of status of Projects with specific focus on any "risk" areas - presented by PROTEC7 (31 - 34 of 53). Drove clarification questions across the functions. Presentation of longer term projects building of new technologies out through 2025 and beyond (36 of 53). Alignment clarification challenge by PROTEC2 - "Showing yellow status but we have not been able to validate a core part" - when discussing "Raman Technology" - Agreed by team after discussion to move to "Red" status.	Strategic Projects are a key element of Scope for SA	31-34 of 53	SA Discussion	Product	3(4)
24	Product roadmap changes being presented in the review by PROFAC1 and it prompted discussions from MFG and QAL functions that full implications of changes may not have been considered. Drove actions to ensure alignment is achieved.	1	4	1. Product/Project Roadmap Changes can trigger SA discussions to ensure alignment across functions	Product Roadmap changes prompted discussion to consider some other implications in terms of the timing - action taken. Key integrated discussion between operations and Product Portfolio management	Importance of an Integratrated Plan	9 of 82	SA Discussion	MP-Supply Point Review	2
2	Changes to the product raodmap generated from within the site crerated a discussion to ensure alignment internally and also to ensure get alignment externally as would be an adjustment to the strategic plan.	2	5	2. Product/Project Roadmap changes can trigger a realignment with the Strategic Plan	Discussion on changes to Product Roadmap driven by site. PROFIN1: "Strat plan coming up in the next few weeks - need to understand the implications and ensure Strat Plan reflects the change". But decision made to endorse based on "Confirmation of Ph3 Clinical supply".	Link to Strategic Planning Process	16 of 41	SA Decision	Product	1
4	Decisions made / endorsed re: product roadmap changes to key platforms, which in turn will be endorsed by corproate as an adjustment to the Strat Plan.	2	5	2. Product/Project Roadmap changes can trigger a realignment with the Strategic Plan	TECPAR3 - Roadmap changes - confirming everyone OK to endorse and potential changes (LY & MB). Cost implications discussed. Specific cycle when decision needs to be made explicit in the table.	Link to Strategic Planning Process	15-16 of 41	SA Decision	Product	1
7	Change to timing of Strategic Project drove update to Strategic Projects Roadmap, subject to SLT approval and update start plan accordingly.	2	5	2. Product/Project Roadmap changes can trigger a realignment with the Strategic Plan	R11 for LY3 - rescheduled out to 2026. "Make changes to Strat Plan as part of annual update" - PRJFAC1	Importance of having a startegic plan structured as roadmaps.	6-7 of 45	SA Decision	Projects	1
36	The Product Roadmap was structured with sufficient detail showing activities by month over an extended period, which enabled strategic alignment across functions and ensured a truly integrated plan and decision to endorse.	2	5	2. Product/Project Roadmap changes can trigger a realignment with the Strategic Plan	Endorsements of the roadmap - final decision on behalf of the site to endorse all proposed changes to the roadmaps. Final alignment to be received on completion of the SP process.	Having structured product roadmaps as part of the stratgeic plan is a key enabler to SA.	15-20 of 46	SA Decision	Product	2(3)
38	Review of key changes that had been concluded in the project stage and gate process (P3M0) and looking for cross functional endorsements to ensure every functiona was aligned.	2	5	2. Product/Project Roadmap changes can trigger a realignment with the Strategic Plan	P3MO decisions endorsed by the Strategic Projects Team.	Importance of an Integrated Plan to enabling strategic decisions made	30 of 48	SA Decision	Projects	2(3)
54	Changes to roadmap were reviewed and confirmed across all fucntions that were aligned and so changes were endorsed pending coportate approval.	2	5	2. Product/Project Roadmap changes can trigger a realignment with the Strategic Plan	Review of detail on specific roadmap proposed changes and request for endorsements (16-24 of 53). All changed endorsed with some pending approval by OPR (Corproate).	Importance of Strategic Plan and Product Roadmap	16-24 of 53	SA Decision	Product	3(4)
9	Data presented and discussion ensued with quick conclusion that there was a need to add more machine testing capacity for the NEOGAA ICB lab and decision made to proceed with the Capex activity.	7	6	7. A team that buys into the core principles of IBP will enable SA discussions / decisions	Proceed with local SPE for capex on NeoGAA ICB lab equipment qualification (Stability)	Trust in presenter and data is key to building the "growth mindset"	Pg 2 of one-page summary + 52 of 68	SA Decision	SP-Supply Point Review	1

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14	The latest volumes triggered some discussions as to whether the 2025 numbers in particular. As were in the middle of the Strat plan process, decided to stick to "one set of numbers" while actions taken to check with latest strat plan positioning, before any action.	7	6	7. A team that buys into the core principles of IBP will enable SA discussions / decisions	31M doses to 28M drop from 2024-2025 RX impact. VA from 170 to 158 (€M) based on this impact. It is one set of numbers but a big drop since last month. Do we believe 2025 plans - "Not far away and will have an impact if have to drive actions accordingly" - IRRFIN1.	Disciplined behaviours when "growth mindset" is achieved	8-9 of 71	SA Discussion	IR Review	1
34	By facing the reality of the performance of the Zwick (2 on site but one in repair and so offline for a number of months) with it also being a key point of failure for many products, drove a business continuity discussion to invest in a 3rd machine.	7	6	7. A team that buys into the core principles of IBP will enable SA discussions / decisions	QC - Zwick - capacity showing green but SLTCHA1 asks: " I feel we are at risk with Zwick - does anybody else share this feeling?" - SLCHA1. Response from SLTMFG2 "I agree one has been down for 3 months , leaving us with one that if it goes down we are in trouble" . Action taken to evaluate the option of buying another Zwick (250K) - based on continuity planning	Growth mindset achievement enables team engagement	43 of 57	SA Decision	MBR	2
44	When reviewing QC capacity, a critical piece of Capital equipment (Zwick) was discussed and despite 2 X machines on site it was suggested that for continuity planning a justification for a 3rd machine should be raised (especially as 2nd machine had been down for a number of months).	7	6	7. A team that buys into the core principles of IBP will enable SA discussions / decisions	Zwick discussion continues - one operaitons / one in repair / one investment being considered for extra backup - need to work with vendor to as future projections assume 2 x Zwick machines - MBOQAL4	Growth Mindset capability enables SA discussions to offset risks even when no gaps are indicated.	30-31 of 51	SA Discussion	MP-Supply Point Review	3
18	Having strategic projects as part of the scope provided a vehicle for discussion relative to Capex challenges expected to be coming from Corproate. Clear that strategic financial targets have to be met.	10	7	10. Adding financial impact information can be a key enabler to engaging the team in SA discussions / decisions	"Need to prepare for requests for Capex reduction - Let's get ahead and prepare a list with clear reasons and therefore impacts of not doing - go towards T1B24 and SP" - SLYCHA1 - IBPLED2 took the action. "This is an appoach by Corp to try and squeeze out projects that are are relatively low VA - nice to have"-SLTCHA1	Having strategic projects as part of scope is key to SA.	12-13 of 53	SA Discussion	MBR	1
40	The purchasing discussion on changing the strategic MOH targets for key compoinents became very focused once the financial implications were also prosented and drove a discussion that included ensuring that impact is reviewed by SLT at the MBr before final decision is made.	10	7	10. Adding financial impact information can be a key enabler to engaging the team in SA discussions / decisions	Purchasing material MOH versus target and financial value (standatd cost) based on 6MOH / 12MOH target with notable exceptions (20-21 of 64). Financial inventory view of LYP V MBP prompted challenge from SUPCHA1 to say "This is a significant value - should be presented to SLTFIN1 to make sure there is awareness and agreement on this value which is triggered by the MOH inventory policies". Drove a discussion on whether the impact of the startegic targets are understood at all levels - "Also drives warehouse capacity investments" - SUPWH51. "With resview with relevant parties, it may drive a review of the MOH targets" - SUPCHA1. Interesting to see how the discussion changes once the financial value is provided along with MOH. "Note that we have time to discuss because we are still not there and will likely take 18 months to get to these values" - SUPCHA2.	Importance of financial integration as a key enabler to SA	20-21 of 64	SA Discussion	Supply Chain	3
46	When finance IRRCHA2 highlighted impact to VA and potentially CRI in 2024/2025 then it drove a strategic discussion about investigating whether can bring in some volume from external manufacturing.	10	7	10. Adding financial impact information can be a key enabler to engaging the team in SA discussions / decisions	LYP Capacity loading shown out through 2032 - only requirement is to level load 2024/2025. Challenge from IRRCHA2 to see if there are opportunities for more fills in 2025/2026 as capacity loading is down to 76% and 81% - "Otherwsie we will have an impact on VA - for example we should review contract timing with external supplier - may want to start planning to bring in some of that fill capacity in 2025/2026?" (27 of 60).	Importance of financial integration as a key enabler to SA	27 of 60	SA Discussion	IR Review	3
39	Discussion led to recognition that while potential issue was outside the IBP horizon, the volumes in the Strat Plan are such that a decision would need to be made inside the IBP window. Actions taken to understand when decision would need to be made.	9	8	9. The decision-lead time to close gaps determines when SA decisions need to be made	V&Os reviewed - discussed longer term ambient workshop and while it looks like actions only need to be taken outside 36 month IBP horizon but may need a decision sooner within the IBP horizon - should add as an extra vulnerability based on outcome of the workshop and also could require an escalation to MBR. Potential problems on the horizon based on latest volumes in 2025/2026. Discussion driven by SUPCHA1 leveraging IBP language - "Decision will need to be made within the IBP horizon even if impact is outside the IBP horizon so needs to be brought forward to MBR and called out in V&O".	The decision lead-time is a key enabler to strategic decision making	8 of 64	SA Discussion	Supply Chain	3
50	Discussion initiatived by SLTMBO that 2025 volumes changing every month but level of swing is such that decisions do not need to be made now and it is OK to monitor - team agreed.	9	8	9. The decision-lead time to close gaps determines when SA decisions need to be made	Discussion around plan changes in 2025 with AI (28 of 61) and whether they should react - agreed that such decision should be based on the size of the changes and the corresponding leadtime associated with being positioned to handle the 2025 volumes - "Once we hit the lead-time then we will need to react but for now based on those changes it is OK for us to monitor" - SLTMFG2	Value of "lead-time" aspect in the the CF as part of Scenarios"	28 of 61	SA Discussion	MBR	3
11	The latest volumes indicated some big changes relative to the strategic plan in the longer term horizon, where key projects were justified. This triggered immediate concerns and associated discussion to drive clarification to avoid major impacts to project activity.	11	9	11. Visibility to the Strategic Plan is a key requirement for enabling SA.	"Need to understand from GSC as to why - may be a mistake". "Would you be worried about that level of uncertainty for 2025" - MBOCHA1 - MBOFIN1 "It is a definite worry - volumes are going up and down" - "Impact to capital, project investments - need to highlight but have to use the numbers - everyone has to use the one set of numbers". "Hard to plan for because so much inconsistency in the cycles for the 2025 numbers". "What initiiatives those swings could be impacting - need to understand and highlight"- MBOCHA1	Feedback loop to the Strategic Pan is key to maintain "fit"	26-27 of 56	SA Discussion	MP-Supply Point Review	1
41	Intelligence brought in by the Demand team from the field suggested that there may be a pending change to the Product Roadmap due to backlog in potency testing impacting supply of kits. Drove discussion on potential knock-on impacts to consider.	11	9	11. Visibility to the Strategic Plan is a key requirement for enabling SA.	Any risks to the market launches were discussed and alignment achieved on associated actions being taken - Example of discussion on OPL launch - potency testing backlog issues - escalated to MSAT who advised that kits required are being re-stocked and testing was recommenced and beieve that can still meet the launch timing so would be no known impacts. Agreed to monitor as could have long term knock-on impacts if first market launch slips.	Importance of Strategic Plan	24 of 50	SA Discussion	Demand Review	3
8	Delay to project presented but not accepted yet to require a change relative to Strat Plan - push back by PRJCHA1 to revisit to see if actions can be driven "bottom up" to resolve first.	4	10	4. Gap closing versus strategic plan is driven bottom-up and only when exhausted all options then top-down	6 week delay in Carbon Red Programme - challenged by PRJCHA1 looking for mitigation and how delay can be "absorbed" - "Can't just accept a delay without testing if delay can be mitigated" - PRJCHA1 (P8of45).	Growth Mindset drives behaviour to try to close gaps "bottom up"	8 of 24	SA Discussion	Projects	1
35	The self assessment step promted a team discussion when a challenge was raised by IBPLED1 on scoring against demonstrated performance. Casused the team to reflect and confirm they needed to be more diligent on ensuring future plans reflected trends in perfromance. Education opportunity for the team.	8	11	8. Feedback loop on process performance enables building higher levels of capability	Self assessment conducted at the end. Demonstrated a strong team view with many scores at maximum 4.0. Good challenge from IBPLED2 on 'planning based on demo perf' as to whether known H/C freeze is factored into future plans? Team responded through a number of participants and there was agreement to review program plans again under this constraint consideration.	Education has to be ongoing to build higher orders of capability leading to a collective "growth mindset"	N/A	SA Discussion	Product	2(3)

Appendix 6.5: IBP Reviews SA RAG Perspective

Product Review

The Product Review tracked the long-term plans for changes to the product portfolio at 'BigPharma'. The latest status of the various projects supported to drive the product portfolio changes were presented in the reviews highlighting any changes relative to the product roadmap. This presented a clear picture of potential gaps between the IBP plan (latest Product plans) and the strategic plan (product roadmap as part of 'Start Plan'), triggering discussion and actions to close any gaps. Such gaps were initially attempted to be closed "bottom-up" (i.e. drive actions to bring the IBP plan back on track) or if not possible to achieve bottom-up closure, then propose to close "top-down" (i.e. get approval for changes to the strategic product roadmap as part of the strategic plan).

The evolution of the RAG status as the evidence was observed and researcher knowledge increased over the three cycles is shown below:

		Product		
CF Structure	**Conceptual Framework Element**	**Cycle 1**	**Cycle 2**	**Cycle 3**
Contingency Variables	Scope			
	Education			
	Strategic Plan			
	Horizon			
	Maturity			
Response Variables	Product Portfolio Management			
	Strategic KPIs			
	Integrated Business Plan			
	Financial Integration			
	Scenario Planning			
Growth Mindset	Growth Mindset			
Feedback Loop	Feedback Loop			
Performance Variable	Strategic Decision Making			
Planning Hierarchy Poisitioning	Link to SM Review			
	Link to Ops Planning			

RAG status evolution of the Product Review over the three cycles

As shown the evidence over the 3 cycles supported a RAG status reflective of all CF elements being present.

On the first cycle there was not sufficient evidence to provide a "Green" RAG status for all elements and some areas in particular required follow-up through the interviews to provide perspective. Taking 'Education' as an example, it was not possible to understand the

education status of each participant as part of observing the reviews but subsequent interviews with the IBP Process Leads (IBP_LED1 and IBP_LED2) as well as the Chair and facilitators of the Product review (PRO_CHA1 and PRO_FAC1) provided clarity that this was a team educated on the design and principles of IBP. In particular the Chair of the review meeting (PRO_CHA1), a member of the leadership team, had received formal training, as well as many years of direct experience working with the process – *"So I had a kind of background knowledge and seeing it for the last few years".*

The financial integration element was clear when showing the financial budget performance across the product projects for the current fiscal year (see reference to slides 23-26 of 46 in review pack for cycle 2). However, further clarity was provided through the interview with the review facilitator (PRO_FAC1) that the longer-term financials were reviewed for any changes as part of the individual product reviews in the supporting stage and gate ('P3MO') process – *"You know at the indications what we look for is in particular is if there's a movement from one year to the next that could impact budget or if the change in finance is significant enough that we need to then raise a flag or an update through the P3MO process"*.

The other areas that were highlighted as 'Yellow' status from cycle 1 became clearer as the cycles progressed with evidence emerging to support a transition to 'Green' status as evidenced in the data capture files.

Strategic Projects Review

The strategic projects review (referred to as Projects Review for brevity) is a dedicated review meeting as part of the monthly IBP cycle at 'BigPharma'. In comparison to the generic definition of the IBP process (as outlined in Chapter 1) 'BigPharma' made a decision to bring all strategic projects into a single portfolio for review as opposed to having such projects distributed across all the other reviews. This decision by Bipharma is in recognition of the importance of a number of major projects in building the capabilities of the site for enabling continuous future growth. This review meeting was therefore an opportunity each month for a core team to review the latest projections versus the strategic plan expectations, for the portfolio of projects and make decisions to keep projects on track, as much as possible.

From observations over the three cycles the evolution of the RAG status for the Projects Review is shown below:

		Projects		
CF Structure	**Conceptual Framework Element**	**Cycle 1**	**Cycle 3**	**Cycle 3**
Contingency Variables	Scope			
	Education			
	Strategic Plan			
	Horizon			
	Maturity			
Response Variables	Product Portfolio Management			
	Strategic KPIs			
	Integrated Business Plan			
	Financial Integration			
	Scenario Planning			
Growth Mindset	Growth Mindset			
Feedback Loop	Feedback Loop			
Performance Variable	Strategic Decision Making			
Planning Hierarchy Poisitioning	Link to SM Review			
	Link to Ops Planning			

RAG status evolution of the Projects Review over the three cycles

The evidence from observing the Project Review showed that all of the elements of the conceptual framework (CF3) were present. This became clear from cycle 2. The researcher remained cautious through cycle 1 so some elements were coded with an amber RAG status. The education element was highlighted for further information gathering through the interviews before it was coded with a green RAG status. Similarly with financial integration where the discussions appeared to be just on the current year's budget but subsequent interviews, especially with the finance representative (PRJFIN1) clarified the critical aspect of financial integration as part of each project justification and ongoing management. Scenario planning was not called upon in the first review observed but subsequent reviews included discussions around having scenarios in support of potential decision making activities. In the interviews, informants IBP_LED1 & IBP_LED2 also stated that scenario planning was a key part of the individual project management process when presenting items for decision making into the Projects Review. Finally the amber status on the feedback loop was just to allow more iterations of observations to seek evidence that it was not just that the self-assessment was conducted, but more importantly that the feedback prompted action to be taken. This became clear through observing subsequent reviews where key actions were taken based on the feedback trends (e.g.:- Education programme intervention for the QAL* representatives).

Supply Chain Review

The Supply Chain Review is a relatively new review for 'BigPharma', having been introduced in the process within the last six months before initiating the case study. It's purpose was to provide a forum where supply chain planning activities, that were not getting sufficient attention in the individual supply reviews, could be discussed and proactive decisions made. The supply chain review scope was on topics that were common to both supply platforms (e.g.:- warehousing, artwork, inventory management, procurement).

The RAG status evolution over the 3 cycles observed is shown below:

		Supply Chain		
CF Structure	**Conceptual Framework Element**	**Cycle 1**	**Cycle 2**	**Cycle 3**
Contingency Variables	Scope			
	Education			
	Strategic Plan			
	Horizon			
	Maturity			
Response Variables	Product Portfolio Management			
	Strategic KPIs			
	Integrated Business Plan			
	Financial Integration			
	Scenario Planning			
Growth Mindset	Growth Mindset			
Feedback Loop	Feedback Loop			
Performance Variable	Strategic Decision Making			
Planning Hierarchy Poisitioning	Link to SM Review			
	Link to Ops Planning			

RAG status evolution of the Supply Chain Review over the three cycles

During the first cycle observed there was a lot of discussion around the design and approach to the review and in particular the sequence of how things were reviewed to optimise the time for the key discussions. An agreed change to move the review of the current performance across key metrics to the end of the review proved to be a key change that removed the risk of spending too much time on the short-terms issues. The observations of cycles 2 and 3 showed more evidence of the CF3 elements but there remained some areas that the evidence would indicate that there was another level of maturity to be obtained to ensure a sustainable SA engagement. The implication from the observations was that with a spread of differing levels of experience it depended on the topic in question on whether SA was engaged effectively or not. For instance the warehouse leader (SUP_WHS1) was clearly experienced

and understood the longer-term expectations from the process. The associated presentations and scenarios presented were very effective in engaging the team in SA discussions and decisions. Other functions (e.g.:- Artwork) were at a lower level of maturity and while showing early signs of understanding, needed some more cycles to gain maturity.

Demand Review

The Demand Review provides a definite context specific aspect to the 'BigPharma' IBP process. As the IBP process is conducted at a supply site there is no commercial resources as part of the organisation entity at 'BigPharma'. The expectation of the demand review process, and ultimately the demand review meeting, is to provide a future plan with associated intelligence supporting any changes over the IBP horizon, of up to 36 months. The knowledge supporting the plans provided valuable information to the other steps in the process to support positioning capability for the future and making decisions about capacity and inventory positioning.

From observing the three cycles the RAG status profile for the Demand Review evolved as shown below:

		Demand		
CF Structure	**Conceptual Framework Element**	**Cycle 1**	**Cycle 2**	**Cycle 3**
Contingency Variables	Scope			
	Education			
	Strategic Plan			
	Horizon			
	Maturity			
Response Variables	Product Portfolio Management			
	Strategic KPIs			
	Integrated Business Plan			
	Financial Integration			
	Scenario Planning			
Growth Mindset	Growth Mindset			
Feedback Loop	Feedback Loop			
Performance Variable	Strategic Decision Making			
Planning Hierarchy Poisitioning	Link to SM Review			
	Link to Ops Planning			

RAG status evolution of the Demand Review over the three cycles

Clear from the first cycle was the maturity of the participants in the review meeting, based on the language that was used (quoting IBP principles) and the cross functional challenges that occurred. For some of the other elements evidence came to the fore in subsequent cycles turning the RAG status from amber to green. Due to 'BigPharma' being a manufacturing

supply based business and therefore not having commercial accountability, there were constraints on the CF3 elements of 'Strategic KPIs' and 'Strategic Decision Making'. There were important KPIs presented and shown in the review (e.g.:- Demand Plan Accuracy measured by Mean Absolute Percent Error). However, the ownership for improving the performance of the demand plan rested firmly with the commercial organisation. There were related meetings where the site demand team engaged the field supply chain organisations, presented the demand plan accuracy KPIs and tried to influence actions to be triggered. These actions were discussed in the review and were encouraged by the Chair of the review but there was no authority to make any related strategic decisions.

Steriles Platform Supply Review (SPO Review)

This review was one of two separate supply review meetings aligned to the core supply platforms of the business. The purpose of the review is to ensure that everything is in place to meet the future demands for the products in the supply platform, over the IBP horizon (up to 36 months).

The RAG status evolution over the 3 cycles observed is shown below:

		SP Ops Review		
CF Structure	**Conceptual Framework Element**	**Cycle 1**	**Cycle 2**	**Cycle 3**
Contingency Variables	Scope			
	Education			
	Strategic Plan			
	Horizon			
	Maturity			
Response Variables	Product Portfolio Management			
	Strategic KPIs			
	Integrated Business Plan			
	Financial Integration			
	Scenario Planning			
Growth Mindset	Growth Mindset			
Feedback Loop	Feedback Loop			
Performance Variable	Strategic Decision Making			
Planning Hierarchy Poisitioning	Link to SM Review			
	Link to Ops Planning			

RAG status evolution of the SPO Supply Review over the three cycles

The team managing this review meeting demonstrated as a mature team who understood the SA requirements of the review and were striving to achieve same. From the first cycle some of the conceptual framework elements were lacking evidence and so were coded with an

amber RAG status. Most of these elements were clarified through subsequent cycles and the semi-structured interviews. For example, in the first cycle the opportunity for the feedback loop to be engaged was evident from the self-assessment that was conducted. However, it was only through a combination of observing more cycles and questioning the IBP leaders (IBP_LED1 & IBP_LED2) that clarity was brought to how these feedback results are trended and prompt systematic action is triggered (e.g.:- driving an education intervention for specific functions). The only area that remained at an amber status was the link to the operations planning, whereby there was evidence that the short-term performance was reviewed but the discussions did not assess the impact of current performance on the IBP plans.

MBO Platform Supply Review (MBO Review)

The other supply review for the mAbs supply platform. This manufacturing platform was an important platform for new products and due to the specific biologics process, required a number of different Quality Control (QC) testing stages (eg: chemistry, microbiology, stability testing).

The RAG status evolution over the 3 cycles observed is shown below:

		MP Ops Review		
CF Structure	**Conceptual Framework Element**	**Cycle 1**	**Cycle 2**	**Cycle 3**
Contingency Variables	Scope			
	Education			
	Strategic Plan			
	Horizon			
	Maturity			
Response Variables	Product Portfolio Management			
	Strategic KPIs			
	Integrated Business Plan			
	Financial Integration			
	Scenario Planning			
Growth Mindset	Growth Mindset			
Feedback Loop	Feedback Loop			
Performance Variable	Strategic Decision Making			
Planning Hierarchy Poisitioning	Link to SM Review			
	Link to Ops Planning			

RAG status evolution of the MBO Supply Review over the three cycles

The evidence from observing this review meeting resulted in many of the conceptual framework elements coded with an amber RAG status. This was primarily driven by the Quality function in the review meetings, who were not at the same capability as the rest. In addition the quality function was particularly crucial within this manufacturing platform. For topics that were not directly related to the quality function SA enablement was still achieved. But as captured in the 'SA in Action' analysis, when the quality function were an integral part of the discussions then many 'SA missed discussions' were observed. A specific intervention had been triggered to provide targeted education to the quality function but this had not been completed before the case study was concluded.

Integrated Reconciliation Review (IRR)

The IRR was a consolidation review where all the issues raised through the cycle are considered, to determine what has to be escalated to the Management Business Review (MBR). As such it is very much a preparation review for the MBR and is attended by representatives from each of the other IBP steps, the IBP Process Leader and the head of finance for the business. Part of the role of the IRR team is to ensure that all the right information is available to engage the MBR team appropriately.

The RAG status evolution over the 3 cycles observed is shown below:

		IR Review		
CF Structure	**Conceptual Framework Element**	**Cycle 1**	**Cycle 2**	**Cycle 3**
Contingency Variables	Scope			
	Education			
	Strategic Plan			
	Horizon			
	Maturity			
Response Variables	Product Portfolio Management			
	Strategic KPIs			
	Integrated Business Plan			
	Financial Integration			
	Scenario Planning			
Growth Mindset	Growth Mindset			
Feedback Loop	Feedback Loop			
Performance Variable	Strategic Decision Making			
Planning Hierarchy Poisitioning	Link to SM Review			
	Link to Ops Planning			

RAG status evolution of the Integrated Reconciliation Review over the three cycles

The observations related to the conceptual framework produced evidence to say that this was a mature process. The amber RAG status' that remained after the 3 cycles were again heavily influenced by the quality function as many of the key issues that needed escalation to the MBR were coming from that function. This impacted the integrated plan and ultimately to the collective group growth mindset. The link to operations planning perspective was fed through from each of the supply reviews where the evidence indicated that the current performance was not factored into the future plans.

Management Business Review (MBR)

The MBR is the highest escalation point through the IBP cycle and as such is essentially made up of the senior executive team of 'BigPharma' as well as one of the IBP leaders (IBP_LED1), who facilitated the review meeting. The purpose was to achieve a collective perspective of the business plan up to 36 months in advance, highlighting any areas where there was a gap to expectations as set out in the strategic plan ('strat plan') and if so, making decisions based on recommendations on how to close the gaps.

The RAG status evolution over the 3 cycles observed is shown below:

		MBR		
CF Structure	**Conceptual Framework Element**	**Cycle 1**	**Cycle 2**	**Cycle 3**
Contingency Variables	Scope			
	Education			
	Strategic Plan			
	Horizon			
	Maturity			
Response Variables	Product Portfolio Management			
	Strategic KPIs			
	Integrated Business Plan			
	Financial Integration			
	Scenario Planning			
Growth Mindset	Growth Mindset			
Feedback Loop	Feedback Loop			
Performance Variable	Strategic Decision Making			
Planning Hierarchy Poisitioning	Link to SM Review			
	Link to Ops Planning			

RAG status evolution of the Management Business Review over the three cycles

The Senior Leadership Team (SLT) were a relatively new team, with a number of recent promotions. Of particular note was that the MD had been promoted internally into the role within 6 months of the start of the case study. However, like many of the other promotions, the MD had been involved with the IBP process in various roles for a number of years. The relatively new team environment manifested itself in the first 2 cycles in particular as the team being reluctant to challenge outside of their function. Instead they appeared to wait for the MD to instigate any challenges before then feeling comfortable to contribute. By the third cycle of observation this had improved greatly.

As per other reviews the amber RAG status that remained after the 3 cycles related primarily to the impact of the quality function who were lagging the others in terms of maturity. SA discussions that did not directly involve the quality function were forthcoming and the key SA decisions that had to be made were indeed made when required.

Appendix 6.6: Growth Mindset Capability Assessments with Criteria

A	Product Portfolio Review			Growth Mindset				
Level	Dynamic Capabilities View	Case Study IBP Capabilities	Supporting Data	Trust	Discipline	Leadership	R&R	Comms
3	Dynamic Capabilities	One strategically focused team	Capabilities Level	Collective trust of team for each other. Confidence on actions to deliver the strategic plan alignment.	Supportive cross functional team environment with confidence to call out risks to strategic plan	Senior leader drives cross functional engagement to maximise input in achieving SA	Ownership and accountability for the collective set of data presented and actions to close any perceived gaps	Team actions/decisions structured to facilitate integration across all other steps in the process
			Supporting evidence from observations in review meetings	Team comfortable to challenge themselves, understand the expectations of the process eg:- Demand Lead reinfoircing importance of imminent product launch plans in terms of potential impact to longer term planned launches if it missed. "Know it is a short term issue but if this does not hit it will have definite impacts to future launches" - PRODEM1 (PRO4) No questioning of the data - focus by team was on the impact - trust of the team clear (PRO3)	Team environment evidenced by ability to challenge each other, acknowledge when had mis-understanding and no hesitation in highlighting broader implications to risks and potential decisions (PRO1)	Review Facilitator was expert and ensuring that the key issues from the review pack were what people concentrated on for the discussions. Chair opened the meeting with strong focus on safety and was available when required to confirm actions and bring clarity to discussions (PRO1)	Everyone seemed to understand their role (PRO1) R&R of PROFAC1 and PROCHA1 very clear with strong leadership and ownership demonstarted from PROCHA1 - demonstrated through taking the lead on key Roadmap Change communications (PRO3)	A key ingredient into the efficiency of the meeting is the up front prep work and detailed supporting processes (eg:- P3M0) where the detailed discussions can be undertaken. It can mean that in some cases the Product Review is the final alignment step to make sure everyone is on the same integrated plan. Formats presented facilitate efficiency and alignment (PRO3).

B	Projects Review			Growth Mindset				
Level	Dynamic Capabilities View	Case Study IBP Capabilities	Supporting Data	Trust	Discipline	Leadership	R&R	Comms
3	Dynamic Capabilities	One strategically focused team	Capabilities Level	Collective trust of team for each other. Confidence on actions to deliver the strategic plan alignment.	Supportive cross functional team environment with confidence to call out risks to strategic plan	Senior leader drives cross functional engagement to maximise input in achieving SA	Ownership and accountability for data presented and actions to close any projected gaps to strategic plan	Team actions/decisions structured to facilitate integration across all other steps in the process
			Supporting evidence from observations in review meetings	No questioning of data or aggressive challenges to presenters. Open cross-functional challenges. Challenge over maturity from PRJCHA1 - "Review was very quiet - is that because people are already aware of changes? No cross functional challenges?" - PRJCHA1. "Are we participating from a business perspective?" - IBPLED1. "Very much appreciate the alignment I get at this review" - PRJQAL1. Review definitely achieving cross functional alignment (PRJ3)	Pre-reads out on time, focused pack for review, completed within one hour. Good SA language used througout the review: "Assumptions, Vulnerabilities, SLT endorsement required, Mitigating actions" (PRJ1) Language of IBP used by the team - "One "Big Pharma" approach is critical as well as planning based on demonstrated performance." - PRJENG1 (PRJ3)	PRJCHA1 demonstrating strong leadership and ownership. R&R clearly understood and in particualr the PRJFAC1, PRJCHA1, IBPLED1 played key challenging roles (PRJ3)	Roles clear across the team (PRJ1). Good dynamic between Chair and Facilitator. Cross functional engagement throughout. Everyone appears to understand their role - maybe more cycles to develop total cross functional role perspective also? (PRJ4)	Clear Charts and templates for presenting data. Comprehensive information presented across projects to ensure cross functional alignment is achieved (21-29 of 48) (PRJ3)

C	Demand Review			Growth Mindset				
Level	Dynamic Capabilities View	Case Study IBP Capabilities	Supporting Data	Trust	Discipline	Leadership	R&R	Comms
2	Strategic Capabilities	Principles of S&OP/IBP evident	Capabilities Level	Trust across the team is evident enabling business and limited process discussions	Language of IBP evident in discussions and when challenging projections	Senior leader leads by example in leveraging the principles of IBP in discussions to build robustness of future plans	Ownership and accountability for data presented and actions to close any projected gaps to strategic plan	Team actions/decisions structured to facilitate integration across all other steps in the process
			Supporting evidence from observations in review meetings	"Achieveing this maturity is 50% down to nurturing the right behaviours" - DEMCHA1 (DEM2) Clearly lot of trust in DEMFAC1 and DEMFAC2 in particualr but also all the DEMDEM* contributors when presenting their slides (DEM3)	Good ownership on action log and progressing actions according to commits (8 of 66) (DEM2) Self Assessment conducted and honest assessment - strong team (DEM2) Good behaviours and demonstration of trust through good contributions across the team and open discussions on some new charts based on the shift towards net demand. Full acceptance of corrections that were triggered to specific demands as a result of new reports (DEM3)	Strong discussion and push by the team to sort out the strategic KPIs based on changes proposed as part of Digital Transformation, showed a collective appreciation for the importance of long term planning (DEM1) Strong leadership commitment from DEMCHA1 and careful transitioning to new DEMCHA2 orchestrated (DEM2)	R&R clearly assigned, including action taker and time-keeper. DEMCH1 is also the SUPCH1 and maybe a natural bias towards SUPCHA1 role? (DEM1) Clear through discussions that it is a mature and trusted team with everyone knowing their roles and responsibilities. (DEM2)	Vulnerability - RX 22 week delay confirmed - DEMSUP2 " Roadmap has been updated (20 of 66). "Watch knock on scenario - may have to keep more PFS - same demand, different format "- DEMCHA1. RX delay linking through all the reviews (20 of 66) - shows focus on integration across functions (DEM2)

D	Supply Chain Review			Growth Mindset				
Level	Dynamic Capabilities View	Case Study IBP Capabilities	Supporting Data	Trust	Discipline	Leadership	R&R	Comms
1	Functional Capabilities	Mechanics of S&OP/IBP in place	Capabilities Level	Accountability varying across functional roles which can lead to data and process challenges	Language of IBP evident in discussions and when challenging projections but not evident for all functions	Senior leader leads by example in leveraging the principles of IBP in discussions to build robustness of future plans	Ownership and accountability for data presented and actions to close any projected gaps to strategic plan	Data presented using defined templates in support of key discussions required
			Supporting evidence from observations in review meetings	Behaviours reflected a trusted team environment with open challenging and encourgement from SUPCHA1 (SUP1) Some functions still building their process to ensure aligned to longer term (eg:- Artwork, Purchasing) (SUP2)	Interesting use of language from SUPWHS1 when said has to bring scenarios forward to avoid drifting into an "unsafe" environment where could be 90%+ capacity loaded "again". Use of the word "unsafe" very effective to get attention and support for actions (SUP2)	Strong leadership commitment with SLT member as the Chair of the review and very active during the meeting (SUP1). Good dynamic in the review - strong role taken by SUPCHA1 specifically due to it being a handover meeting for SUPCHA2. Careful management to ensure handover of leadership role in the review (SUP3).	Roles and responsibilites clearly understood and come across as team with cross functional challenges (eg:- SUPDEM1 interrogating the charts on data accuracy in a positive team based manner - complimenting focus that it brings to an important topic). SUPFAC1 played an effective role (SUP3). Some functions still grappling with how to contribute to projections aspect (eg:- Artowrk, Purchasing) (SUP2)	Some charts excellent - some still a work in progress (eg:- Artwork, Purchasing, Shift away from Class A KPI focus) (SUP 1-3)

E	Supply Review Steriles			Growth Mindset				
Level	Dynamic Capabilities View	Case Study IBP Capabilities	Supporting Data	Trust	Discipline	Leadership	R&R	Comms
2	Strategic Capabilities	Principles of S&OP/IBP evident	Capabilities Level	Trust across the team is evident enabling business and limited process discussions	Language of IBP evident in discussions and when challenging projections	Senior leader drives cross functional engagement to maximise input in achieving SA	Ownership and accountability for data presented and actions to close any projected gaps to strategic plan	Team actions/decisions structured to facilitate integration across all other steps in the process
			Supporting evidence from observations in review meetings	Strong trust across teams evident from collaborative conversations (SPO1) While everyone clearly understood their functional role and represented it effectively, the cross functional challenges on the information was left to a few: SPOCHA1, SPOFIN1, SPOSUP2 (SPO1) Trust evident across the team with slight exception being QAL who immediately said some of the QC capacity charts had to be checked for the efficacy of the model (SPO2)	Overall good mindset evidenced by the language used in the review by the team (SPO2) When reviewing historical KPIs -"I don't expect us to take any action on these KPIs - they are covered in other daily/weekly meetings - I don't see anything that needs an IBP action" - SPOCHA1. Good coaching for the team on the need to stay focused on the longer term plans. (7 of 65) (SPO3)	Strong leadership commitment with SLT member present and active in the review (SPO1) Deputies arrived to cover absentees (SPO1) "Can we have a plan to address the red areas over the years and review in next months review?" - SPOCHA2 (SPO2)	Good clarity on roles and in particular role of SPOFAC1 and SPOCHA1 performed effectively (SPO1). PROCHA1 and IBPLED2 continually provided coaching to team on expectations and where attention should be focused (SPO1).	Product Roadmap changes presented to highlight changes that LYP need to be aligned to (49 of 65) (SPO3) Team discussion at the end to confirm that full integrated alignment had been achieved across all functions - scored at 4.0 in self assessment (SPO3)

F	Supply Review mAbs			Growth Mindset				
Level	Dynamic Capabilities View	Case Study IBP Capabilities	Supporting Data	Trust	Discipline	Leadership	R&R	Comms
1	Functional Capabilities	Mechanics of S&OP/IBP in place	Capabilities Level	Accountability varying across functional roles which can lead to data challenges	Ensure all data is presented on time and in the required format. Attend in person or send a delegate.	Senior leader leads by example in leveraging the principles of IBP in discussions to build robustness of future plans	Role understood and embraced for supporting the requirements of the review meeing	Data presented using defined templates in support of key discussions required
			Supporting evidence from observations in review meetings	Trust across the team evident with the excpetion of QAL - lack of trust evident from challenges that came in from many functions - MBOCHA1, MBOSUP3, MBOMFG1, IBPLED2, MBOMFG2. "I don't understand the graphs and how we are doing this" - MBOCHA1 (MBO2) Body language (Scratching head when listeniong to QAL updates). 'When have approval for H/C can we estimate when have on board and reflect that in the charts with that assumption?" - MBOCHA1 (MBO2)	MBOCHA1 had to leave before the final scoring (meeeting ran over scheduled finish time) but team still were honest in scoring themeselves down based on lack of maturity (MBO1) Good discussions around self-scoring assessment at the end and scores adjusted down to be realistic and open about the challnges being encountered. (MBO2)	Leadership commitment clear from MBOCHA1 - Present, Vocal, IBP language, IBP principles, Support (MBO2) Strong role played by MBOCHA1 and IBPLED1 and IBPLED2 in particular and also the MBOFAC1 (MBO3)	Same story with QP AI caapcity projection (36 of 51) showing 200% in 2025 with not tangible way to address. "there are some ideas on how to address 2024/2025" - MBOQAL3, but not included in the slide - IBPLED1 - "Why did we not include this in thr slides" (MBO3)	Clear updates on Product Plan as it relates to MBP (6 of 51). Confrmation that everyone aligned (MBO3) Clearly while team frustrated with QAL data but team effort to decide on how can provide support to builod first order (data charts) and second order (IBP principles) - IBPLED2 to lead support effort (MBO2)

G	Integrated Reconciliation Review			Growth Mindset				
Level	Dynamic Capabilities View	Case Study IBP Capabilities	Supporting Data	Trust	Discipline	Leadership	R&R	Comms
1	Functional Capabilities	Mechanics of S&OP/IBP in place	Capabilities Level	Trust across the team is evident enabling business and limited process discussions	Language of IBP evident in discussions and when challenging projections	Senior leader attends and chairs the review meeting and takes an active role in the meeting	Role understood and embraced for supporting the requirements of the review meeing	Data presented using defined templates in support of key discussions required
			Supporting evidence from observations in review meetings	The tight team of IBPLED1/2, IRRSUP1, IRRMFG1, PROFAC1 demonstrate a high order capability in terms of language used and corss functional challenges that they are comfortable to make and receive. These are a trusted team. IRRHRM1 and IRRQAL1 engaged just for their function and demonstrated a lower level of capability - compliance rather then engagement (IRR2)	Discipline around updating the open action log seemed to be missing (IRR1) Example of mature behaviours: 31M doses to 28M drop from 2024-2025 RX impact. VA from 170 to 158 (€M) based on this impact. It is one set of numbers but a big drop since last month. Do we believe 2025 plans - "Not far away and will have an impact if have to drive actions accordingly" - IRRFIN1. (8-9 of 71). Action taken to validate before any major decisions are taken (IRR1)	Strong leadership from IBPLED1/2 to esnure alignment to strategy and longer term plan alignment (IRR1) SLTFIN1 as the official chair sent a delegate for IRR2 & IRR3 Agree by team that are ready with the implications in particualr being important to understand. IRRCHA2 - "Cost of not getting the extra 4 headcount much greater than headcount cost itself - need to proceed or will have backlog on some key products". "To esnure decision gets made let's put a financial number of the impact of not supporting one of the scenarios"- IBPLED2 (IRR3)	Key assumption from QC Chem that failure rate to decrease from 20% to 10% (39of58) - 'new methods being deployed so expect to kick in in 2024" - IRRQAL1. QAL rep not have the required information to answer the challenging questions from IBPLED1 - key actions to be taken but not able to engage it properly (IRR2) Product Update - "Reds have been discussed - PROCHA1 fully aware and ready to discuss at MBR and answer any questions"- PROFAC1. Shows effieincy and effectivness of having a FAC who clearly understands R&R (IRR3)	Supply volumes presented to ensure all updates were fully integrated (23-25 of 60). Quality plans improving but still not fully integrated as not fully "trusted" but focus remains to have one integrated plan (IRR3)

H	Management Business Review			Growth Mindset				
Level	Dynamic Capabilities View	Case Study IBP Capabilities	Supporting Data	Trust	Discipline	Leadership	R&R	Comms
1	Functional Capabilities	Mechanics of S&OP/IBP in place	Capabilities Level	Accountability varying across functional roles which can lead to data challenges	Language of IBP evident in discussions and when challenging projections	Senior leader drives cross functional engagement to maximise input in achieving SA	Ownership and accountability for data presented and actions to close any projected gaps to strategic plan	Data presented using defined templates in support of key discussions required
			Supporting evidence from observations in review meetings	Some cross functional challenges - more focus by functions - SLTSUP1 most comfortable to challenge as well as IBPLED2 to help SLTCHA1 (MBR1) Seems to be good cross functional engagement across the team today - better than previous 2 witnessed - good use of IBP language - "demonstarted performance", "sceanrios", "assumptions" (MBR3). Overall as a team there is a "growth mindset" which allows the carrying of less capable functions (eg:-QAL) (MBR2) Team need more cycles to build higher order capability and ensure the collective trust carries towwards business versus process discussions (MBR3)	SLTCHA1 particularly focused on discipline of following through on previous directions (eg:- controlled switch from Class A KPIs to Skye KPIs). "I was tempted to walk out when I saw the KPI presentation when I has explicitly asked to stay with Class A KPIs until all bugs have been fixed with new Skye system" - SLTCHA1 (MBR3) Discussion up front on whether action re: attendance has worked and that discipline is being shown by all required attendees - challenge comes from SLTCHA1 (4 of 61) (MBR3)	Strong leadership from SLTCHA1 to challenge and try to invite understanding of key principles to deliver realistic plans for the future - recognition of new team by inserting a few "veiled threats" (If can't solve inspection capacity then will be asked to reduce fills to match". Reflective of other sites ablty to take up the slack (MBR1)	Strong leadership from Chair and SLT in general Proactive engagement by SLTHRM1 re QP capacity even showing in control for next 3 years. "Expereience is that it takes a long time to hire QPs - are we sure we are covered into the future and what are the risks to avoid a crisis like we were in this time last year?" - SLTHRM1 (42 of 57).	Trust in QAL plans remains a concern leading to challenges on the data as opposed to being able to focus on the actions to address potential issues (MBR2) Alignment across all functions represented at the SLT on all key issues that need SLT attention at the MBR (MBR3) Review of high level risk register provided a lens into major risks against the strategic drive of the business (17 of 61). However, a few challenges from SLTCHA1 on the positioning of risks on the matrix by SLTQAL drove an extended discussion on how objective the ratings were in reality and SLTSMS1 was actioned to review to ensure it was more formulaic and transparent. (17 of 61) - MBR3.

Appendix 7.1: Publishing Work

Journal Paper

SHANAHAN, A. J., 2024. A Research Agenda for Strategic Alignment in Sales and Operations Planning. *IEEE Engineering Management Review*, TBD

Conference Papers

SHANAHAN, A. J., 2009. The ex-ante use of planned revenue in a Sales & Operations Planning (S&OP) system, for more timely and effective decision making, by senior managers, in multi-national environments. *EFOS09: Interdisciplinary Management Research,* pp77-88, Croatia.

SHANAHAN, A. J., 2009. Closed Loop Sales & Operations Planning (S&OP) - The key to more timely and effective decision making, by senior managers, in multi-national environments. *IMC26: Efficient & Low Carbon Manufacturing*, pp329-336, Trinity College, Dublin.

SHANAHAN, A. J., 2021. Sales and Operations Planning (S&OP) – Definition versus Reality. *ISL21: International Symposium on Logistics*. Korea (Online).

SHANAHAN, A. J., 2022. The role of data analytics in contributing to strategic decision making in Sales and Operations Planning (S&OP). *ISL22: International Symposium on Logistics*. Cork, Ireland.

SHANAHAN, A. J., 2023. The role of S&OP in the context of hierarchical decision-making in manufacturing organisations. *ISL23: International Symposium on Logistics*. Enchede, Netherlands.

(Note: Paper received "Best PhD Paper Award at the 2023 ISL conference)



Periodicals

SHANAHAN, A. J., 2012. Integrated Business Planning for Effective Decision Making. *Operations Management*, 38, pp5-13.

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