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**From Gut-Driven to Data-Driven: The Story of
Analytics Leadership**

Thesis presented by

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for the degree of

Doctor of Philosophy

University College Cork

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Declaration

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

Abstract

This thesis explores the multifaceted process of building Business Analytics (BA) capabilities within organisations, presenting a novel conceptual framework that bridges strategy, execution, and organisational transformation. Anchored by the Bake the Cake analogy, this research simplifies the complex interplay between people, processes, and technology in enabling data-driven decision-making, providing both theoretical insights and practical guidance for organisations seeking to leverage analytics for competitive advantage. This thesis also introduces the *Decision Dynamics Matrix*, a framework that maps the progression of decision-making from gut-driven to data-driven, illustrating how organisations evolve as they embrace data-driven transformation.

The thesis is structured around three key layers: the Baker (BA leadership), the Recipe (BA strategies and capabilities), and the Bakery (organisational context). Each layer contributes to an integrated understanding of BA capability development.

1. **The Baker (BA leadership):** The research identifies BA leaders as pivotal to driving data transformation, requiring a mix of transformational, situational, and technical leadership styles. Through an abductive grounded theorising approach, four key leadership themes are conceptualised: (i) *build skills, drive insights, foster innovation*; (ii) *empower teams, foster collaboration, achieve impact*; (iii) *drive culture, adapt strategy, integrate technology*; and (iv) *lead innovation, advocate data, drive change*. This work advances BA leadership theory by showing how BA leaders navigate technological, cultural, and strategic complexities to embed data-driven decision-making.
2. **The Recipe (BA strategies and capabilities):** This layer presents the *Business Analytics Recipe*, a framework comprising four pillars: *Actionable Business Value, Data Skills & Processes, Solid Data & Technology Foundation, and a Data-Driven Organisational Culture*. It highlights the interconnectedness of technical and human dimensions in

building scalable BA capabilities. By addressing challenges such as skill shortages, business alignment, and cultural resistance, the research provides a roadmap for organisations to align analytics investments with strategic objectives and create measurable business impact.

3. **The *Bakery* (organisational context):** This research explores how organisational structures, processes, and cultures influence BA adoption and maturity. Through a case study of HEINEKEN Ireland's transformation, the thesis outlines a progression of BA maturity across distinct eras, assessed using the DELTA framework. It demonstrates that aligning BA capabilities with business goals, fostering cross-functional collaboration, and driving cultural change are critical to creating sustainable value.

A significant contribution of this thesis is the *Bake the Cake* analogy, which has proven effective in simplifying the complex BA concepts for both academic and industry audiences. By likening BA capability-building to baking a cake, it highlights the importance of integrating leadership (the baker), strategy (the recipe), and organisational design (the bakery) to produce successful outcomes.

The ***Decision Dynamics Matrix*** offers a key theoretical and practical contribution, providing a framework to assess and guide the evolution of decision-making from gut-driven to data-driven. It emphasises that data-informed decision-making—where data complements but does not replace human judgment—is an essential transitional stage. However, the ultimate test of a data-driven organisation lies in decision-makers acting on data insights, even when they conflict with intuition.

This thesis also opens new avenues for future research. Opportunities to extend the *Bake the Cake* analogy could include exploring advanced analytics applications, scalability, and application across industries.

Overall, this thesis contributes to the fields of Business Analytics, BA leadership theory, and organisational transformation by providing a holistic framework that integrates strategy, leadership, and culture. It equips organisations with practical

tools, such as the *Business Analytics Recipe* and the *Decision Dynamics Matrix*, to assess maturity, overcome barriers, and scale BA initiatives. By embedding data-driven decision-making, organisations can unlock the full value of their data assets and achieve sustainable competitive advantage.



Picture 1: HEINEKEN Ireland, Leirim Street, Cork

Chapter 1 INTRODUCTION

Introduction to the study

On December 19th, 2023, during HEINEKEN's year-end Global Townhall, the Digital & Technology Director for the Africa and Middle East (AME) Region proudly shared a remarkable achievement: for the second consecutive year, the AME Region, despite being the smallest of HEINEKEN's four global regions, had generated the highest business value from Data & Analytics initiatives. The region was also the first to successfully complete Data Prime, HEINEKEN's company-wide program to implement a cloud-based analytics platform. This success, she explained, was driven by a holistic Business Analytics strategy focused on achieving **Higher business impact**, enabling **Faster time to insight**, and growing **Stronger** as a data-driven, collaborative organisation with a solid foundation of data and technology.

Achieving a data-driven transformation is a complex and multi-faceted process that requires not only technological investments but also effective leadership, strategic alignment, and cultural adaptation. This analytic autoethnographic research thesis explores how organisations develop the Business Analytics (BA) capability to transition decision-making practices from being gut-driven to data-driven, while identifying key success factors, enablers, and challenges encountered along the way. Central to this study is the '*Bake the Cake*' analogy, which serves as a conceptual lens for understanding the interplay between leadership (the Baker), strategies and frameworks (the Recipe), and the organisational context (the Bakery). By providing both theoretical insights and practical tools, this research contributes to a deeper understanding of BA capability-building and its role in bringing about an organisational data transformation and improving business performance.

This introduction chapter is structured as follows. Following the Research Overview section which outlines the overall structure of the thesis and the research objectives, the Research Papers section outlines the four papers and their positioning within the thesis. Following this, I provide a reflective account of

my own journey, in the Researcher Story section offering context for the motivations, challenges, and methodological choices underpinning the research, before introducing the organisational setting for the research in The Research Context section. The chapter then outlines the chosen Methodology, including the rationale for the method selection and an overview of the analytic autoethnographic approach adopted in this study. Finally, the Contributions section introduces the key contributions of this research to both academic theory and practice. Subsequent chapters are made up of the four research papers, before I bring together the overall contributions in the conclusions chapter.

Research Overview

Throughout this research, there is consistent use of the analogy comparing building an organisational business analytics (BA) capability with the baking of a cake. Both endeavours require many elements to come together in the right way to produce a successful outcome. In the same way that a cake requires raw ingredients and baking tools to be used by someone with the skill and knowledge to bring them together in the right way, BA requires skilled people and processes to derive outputs from good quality data using BA tools and technology.

Furthermore, the value of a cake is only realised when a consumer eats the cake, and the value of BA is only realised when a business decision maker consumes the BA and as a result takes an action which they otherwise would not do which leads to an improved business performance. Finally, the environment in which the cake is baked or the organisational culture in which BA is active plays a crucial role in the quality, and efficiency of both the cake and BA. Analogical thinking is a crucial mechanism of human cognition, and the use of analogy is widespread in organisational theory as an effective way of communicating and helping people to understand complex and novel concepts (Ketokivi et al., 2017; Kumar et al., 2014; Leuzzi & Ferilli, 2017). The period covered by this research spans 13 years from 2011 to 2024 and I have been using this cake analogy since 2015 to communicate to business stakeholders the requirement for a holistic

approach to building BA capability. As I found the analogy to be effective in practice, I considered it appropriate to continue its use through this research and I even expanded it beyond the ‘recipe’ for BA capability to include myself as the BA leader creating the capability as a ‘baker’ and the organisation as ‘the bakery’.

This PhD by publication is structured around three layers of building BA capability, namely the outer layer representing the organisation (bakery), an inner layer containing the actions or ‘jobs to be done’ (recipe) and at the core of the research is the BA Leader (baker) responsible for driving the actions and effecting the change in the outer organisation layer. The research is comprised of four research papers which are mapped to the layers as illustrated in Figure 1.

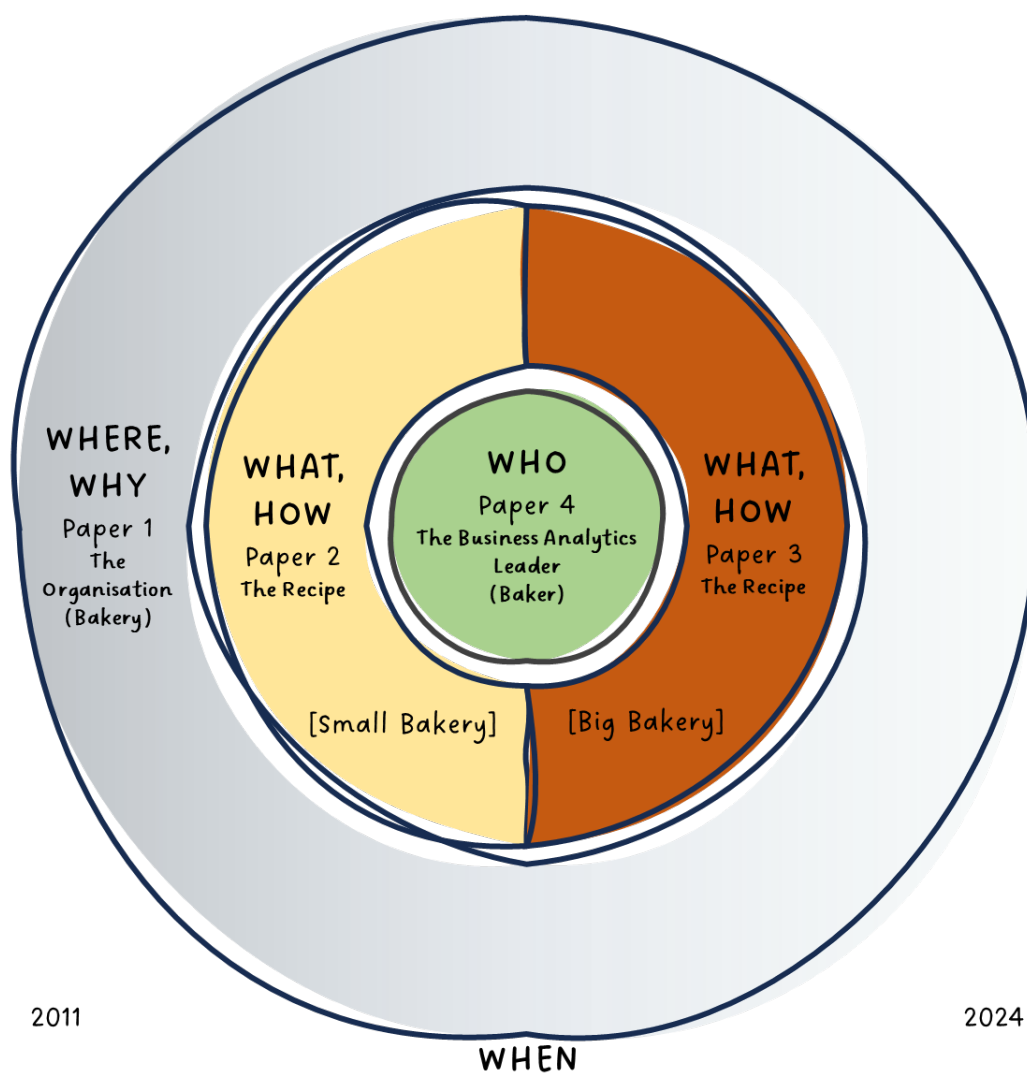


Figure 1. Structure of Thesis

The outer layer of the thesis structure represents both the organisational context in which the research takes place and the purpose of the research as the ambition is to mature the organisational BA capability. The outer organisational layer refers to the organisation in the general sense and includes both organisational contexts covered by this research (HEINEKEN Ireland Operating Company and HEINEKEN Africa & Middle East Region). It is worth noting that the Ireland Operating Company (OpCo) organisational context is researched in some detail in Paper 1 and Paper 2, but the AME Region organisation, (the subject of Paper 3 exclusively and Paper 4 partially) is not researched to the same level of detail. This skew towards the Ireland OpCo and earlier period is represented in Figure 1 by darker shading of the relevant areas of the Outer Organisational layer. To go some way towards addressing this gap, I have provided in the Research Context section on page 30 a DELTA BA maturity assessment of the AME Region, which is comparable to that contained in Paper 1 for the Ireland OpCo.

At the core of this research is me, the business analytics leader, driving the organisational BA transformation, while also developing my knowledge on not only the requirements for the organisational BA transformation, but building an understanding of my own role and required competencies for me and others in similar positions.

The inner layer of the thesis structure connects the leader at the core and the organisation at the outer layer through the process, the actions or jobs to be done to affect the BA transformation of the organisation.

Layer Position	Represents	Describes	Research Objective
Outer	Organisation	WHERE and WHY BA capability developed	To assess the impact of the BA capability-building journey in fostering cultural transformation, delivering measurable business performance, and driving the progression of decision-making practices from gut-driven to data-driven.
Inner	Action	HOW BA capability developed and WHAT was done.	1) To develop a holistic framework for building an organisational BA capability, identifying critical success factors, enablers, and barriers, while providing practical tools for BA implementation. 2) To examine the organisational structures, processes, and cultural factors that influence the successful adoption and integration of BA capabilities.
Core	Leadership	WHO is responsible for driving and implementing the change	To explore and articulate the role of the Business Analytics (BA) leader in driving organisational data-driven transformation and to identify the key leadership competencies and strategies necessary for success

Table 1. Thesis Research Layers

The Research Papers

This PhD thesis is comprised of four research papers, with each playing a role in meeting the research objectives and as outlined in Table 2 are mapped to the three layers of the PhD thesis structure. As can be seen in Figure 1, Paper 1 (How a Traditional Organisation Matured a Business Analytics Capability) sets the scene by introducing the Artisan Bakery in which the BAR (Business Analytics

Recipe) was developed and utilised. This is followed by Paper 2 (Bake the Cake: How a Traditional Organisation Delivers Impactful Analytics) which unpacks the cake recipe and identifies critical success factors for organisations developing a BA capability based on the experiences in HEINEKEN Ireland. If the Ireland OpCo can be compared to a small artisan bakery, where the BAR was created, then the AME (Africa & Middle East) Region represents the large industrial bakery where the BAR was then utilised to develop BA capability at scale. Paper 3 (Unpacking the ‘Black Boxes’ of Analytics: A Data Value Map Analysis) looks at the effectiveness of the BAR within this large-scale organisational context and evaluates the strategy-execution gap between the BA strategy and the reality from the perspective of the teams charged with implementing the BA strategy. Finally, Paper 4 (Bridging the Analytics Strategy-Execution Gap: An Analytics Leader’s Story) evaluates the requirements for the Baker, or BA leaders charged with driving the development of organisational BA capability. Taken together, these four research papers provide a comprehensive study on developing organisational BA capability, covering the formula to be followed (Recipe) in Papers 2 & 3, required leadership traits (Baker) in Paper 4 and the organisational context including the transformation journey (Bakery) in Paper 1.

Papers 1 and 3 have been published at UKAIS Conferences 2023 and 2024 respectively, while papers 3 and 4 are currently under review at Information Systems Management and Information Systems Journal respectively.

Title	Chapter	Thesis positioning	Research Question Addressed	Paper Overview	Organisation Context	Time Period
Paper 1 - How a Traditional Organisation Matured a Business Analytics Capability	Chapter 2	Outer (Organisation) Layer Sets the scene describing the organisational context in which the research was conducted while also describing the organisational capability development over time as the research progressed.	How can a long-established traditional organisation which is analytically impaired develop a BA capability	The BA capability of the organisation is evaluated through the lens of Davenport & Harris's (2017) DELTA Framework as the organisation matures its BA capability through four eras labelled Awakening, Building & Exploring, Advancing, and Leveraging. The four eras were identified as somewhat discrete stages of advancing BA capability and the paper describes the state of BA and the activities being undertaken throughout each of the eras to advance BA capability.	Ireland OpCo	2011 to 2020
Paper 2 - Bake the Cake: How a Traditional Organisation Delivers Impactful Analytics	Chapter 3	Inner (Action) Layer Dives into the actions taken and unpacks the learnings from the development of BA capability within the organisation as outlined in previous paper.	What are the critical success factors (CSFs) to deliver impactful BA within a traditional organisation?	The critical success factors relevant to the development of BA capability in the HEINEKEN Ireland OpCo are identified by analysing the autobiographical phenomenological accounts of the capability development. The identified CSFs are validated through a survey of key business stakeholders in the organisation.	Ireland OpCo	2011 to 2020

Title	Chapter	Thesis positioning	Research Question Addressed	Paper Overview	Organisation Context	Time Period
Paper 3 - Unpacking the 'Black Boxes' of Analytics: A Data Value Map Analysis	Chapter 4	Inner (Action) Layer Examines the effectiveness of the BAR as it is scaled beyond OpCo organisation context to much larger and complex regional organisational context.	How can the strategy-execution gap be closed when implementing a BA strategy in a traditional organisation?	Research to uncover the shared understanding of practices linked to the execution of the BA capability building strategy, by leveraging the Data Value Map to visualise the 'experiential stories' of key informants who are representative of the teams charged with implementing the strategy.	AME Region	2021 to 2023
Paper 4 - Bridging the Analytics Strategy-Execution Gap: An Analytics Leader's Story	Chapter 5	Core (Leadership) Layer Focuses on the core of the research by analysing the traits of the analytics leader driving the organisation developments and bringing the BAR to life across the entire period of the research.	What are the optimum leadership traits required of a BA leader?	An abductive "human-in-the-loop" analysis including open coding of Analytics Leader's autobiographical phenomenological accounts and analysis through leadership behaviour and leader archetypes frameworks. Research identifies four thematic leadership taglines to better conceptualise the remit of an Analytics Leader, looking to bridge the Analytics strategy-execution gap within a traditional organisation.	Ireland OpCo & AME Region	2011 to 2024

Table 2. Overview of Research Papers

Researcher Story

Throughout this research, I and my experiences feature prominently, not only as a researcher but also at times as the subject being researched, such as the analysis of my experiences as a BA leader to understand the role of BA leaders at the core of the thesis structure. Furthermore, autoethnographic accounts are utilised extensively as data sources throughout the research so I feel it is important for the purposes of transparency to provide some context on my own journey and background.

I have been working in data & analytics since 2006 and at HEINEKEN since the end of 2010. I would like to be able to say that I had foreseen the rise of data and analytics and had planned out a career in analytics, but the fact is that I ended up in BA purely by accident. However, I believe the route I have travelled, and experiences gained have significantly influenced my approach and views on BA as I did not enter BA with a background in computer science, statistics or similar field.

After graduating from University College Cork in 1998 with a BSc in Food Business I worked in various sales and marketing roles and by the mid 2000's was an Area Sales Manager for Dairygold Foods (then one of the largest chilled food businesses in Ireland) leading a team of sales reps / merchandisers and responsible for sales to modern retail customers such as Dunnes Stores, Tesco, Super Valu and others across the South East of Ireland. In those days before smartphones, apps and AI driven recommendations, I was operating a little differently in my area to my sales peers in other parts of the country. Instead of entering a customer store and immediately seeking out the relevant contact for a chat about the latest sports game or just a quick look at the shelf fixtures to see how our products were displayed, I started every visit conducting and recording a full audit of our entire product range. This used to take less than 10 minutes but allowed me to identify trends and immediate issues to be addressed leading to focused and fact-based discussions with customers. Another example is rather than following set journey plans each week, I used to analyse the performance

data by customer and develop dynamic plans for my sales reps with prioritised action plans to address the most impactful issues. In 2006, Dairygold Foods identified a need for a business analytics role and after considering external BI candidates, decided the better course of action would be to appoint (in the words of the Sales Director) *“the sales guy who was good with computers”* because I already understood the business and had the aptitude to learn the technical side, while it would have been more challenging for a person with just BI technical knowledge to learn the business side.

My Area Sales Manager job in Dairygold was of course not my first experience with leveraging data to perform better. Throughout my time in college, I owned and operated a small poultry farm in my parent’s garden (my mother was not too happy about it at the time) which averaged about 300 birds at any given time. I was always curious about how I could improve the efficiency of the operation and while I didn’t know it, I was applying analytics to every aspect of the small business’s value chain. For example, I experimented with different breeds of birds, buying them as day olds or older point-of-lay, different mixes of feed, duration of lighting hours, and so on. While totally free range, each bird was allocated a specific house at night, and I recorded the egg production from each house which allowed me to determine the impact of changing the input variables and make data-driven decisions to optimise the operation.

As previously mentioned, I completed a BSc in Food Business as my primary degree, which involved studying subjects such as Microbiology, Engineering, Food Technology, Food Chemistry, etc., which entailed as well as the theory, many hours conducting experiments in labs and many more hours writing up those experiments. The approach was very positivistic, where all experiments were conducted in a controlled environment with repeatable results, and the role of the researcher was to observe. Therefore, leaving college my view of what science is, was limited to the narrow positivist view. And I was fine with that. It made sense to me, and I understood it. However, I found that I was never satisfied just establishing correlations, without understanding why. For me, once a correlation was reasonably established, I was more interested in

understanding the phenomenon behind the correlation, rather than the exactness of the confidence level of the correlation itself. Why does egg production of free-range birds increase if they are housed at night with a few hours of artificial light, why is it that some of the expensive layers pellets feed mix can be replaced by cheaper barley in the summer months without impacting production, why were sausage sales in Kilkenny performing worse than in similar Wexford stores.

I didn't have a label on it, but this Interpretivist approach to not only establish what is happening, but to understand why it is happening has always been characteristic of how I view the world. For example, before college I worked for two summers as a merchandiser in a supermarket responsible for the chilled food section including the cheese fixture. The supermarket was in a city centre location with a higher-than-average percentage of pensioner shoppers. My colleagues had warned me to look out for these pensioners as they would often take apart the cheese display looking for the cheapest block of cheese (in those days cheese was sold by weight with each block individually priced). This was quite frustrating as it led to extra work to tidy up the display multiple times a day. I quickly noticed that the hypothesis of my experienced colleagues was valid as I frequently found solo pensioner shoppers scrummaging through the cheese display in search of the cheapest (smallest) block of cheese. But as an Interpretivist, I still had to ask why. Is it really driven by price as assumed by my colleagues? If so, then why are they buying branded cheese when the blocks of own-label cheese next to them on the shelf are cheaper? Rather than just observing them, I normally intervened and offered to help them find what they were looking for. Maybe I did this to help them, but more likely my motivation was to minimise the damage and save myself more work later. In any case, they normally talked a lot over the couple of minutes it took to find their preferred cheese block. After hearing many varied life stories from many of the pensioners, I established that while price was indeed a secondary motivation, the primary reason many of them looked for a small block of cheese was that they were now living on their own and couldn't finish the block before it went off. As many of

them had grown up or lived through the second world war and a time of food rationing, they felt bad and disappointed in themselves every time that they threw food in the bin. They were not just searching the cheese fixture to save a few pence; they were desperately trying to avoid experiencing the bad feelings of throwing out food. With the insight I now had, not just on what was happening, but why people were behaving as they were, I knew that the personal motivation of these pensioners was so strong that they would not be deterred even to go all the way to the back of the shelf. The solution I came up with was every time I restocked the cheese fixture was to strategically place the smallest packs back two or three rows from the front. Back far enough so that they wouldn't be picked up by the busy mothers shopping on autopilot, but close enough to the front that they would be quickly found by the determined pensioner, thereby saving the rest of the fixture from the pensioner destruction.

The Interpretivist viewpoint has of course stayed with me, and I believe served me well, as my BA career developed. I continued questioning the why, more than the what of things, such as why the sales manager didn't use the brilliant report I created, or why do they think that the rough report that I threw together in 30mins is brilliant.

However, my motivation for questioning and building an understanding of the social phenomena that I encountered was that the resultant knowledge was a means to an end rather than the end in itself. So, the value in understanding why pensioners behaved a certain way when shopping was that it allowed me to take a better action, understanding why certain reports were not taken up by the sales managers was to enable action such as developing a more appropriate report or dashboard.

In 2020, I completed the HARP (Heightening your Awareness of your Research Philosophy) assessment, which is a reflexive tool to help explore ones research philosophy (Saunders et al., 2019). I was not surprised to see that my primary philosophy came out as interpretivism, as seen in Table 3 , but I was initially surprised that it was followed by pragmatism, as I had not considered this

previously. Of course, it should have been obvious that as my primary role is a practitioner in organisations, that when it comes to research that I would be more interested in practical solutions that inform practice than abstract theoretical concepts. Up to that point I had viewed myself as holding dual roles of practitioner and researcher and saw myself moving between them. However, I then realised that I was the one me and my approach to the day job of practitioner was influenced by my interpretivist curiosity just as much as my approach to research was influenced by my practitioner pragmatism. As I will discuss later in the methodology section, I was then very conscious of the need to follow an appropriate methodology for this research which not only was relevant and rigorous but also aligned with my own research philosophy.

Research Philosophy	HARP Score
Positivism	-3
Critical Realism	8
Interpretivism	16
Postmodernism	6
Pragmatism	11

Table 3: Table of HARP Scores

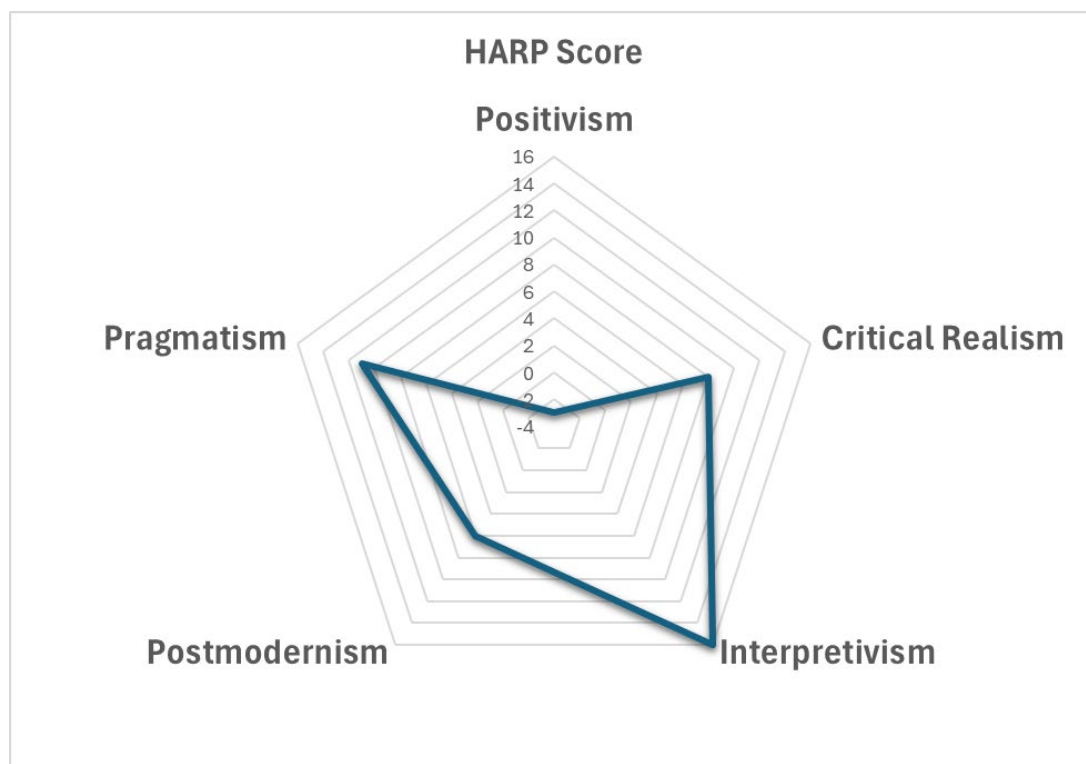


Figure 2: HARP Scores

I believe my less than orthodox background has been a key factor in the success of my BA career to date, as my experience in business roles has given me a deep appreciation of the perspective of the customers of BA and an understanding of their requirements and challenges, which along with my technical BA knowledge allows me to bridge that business – analytics gap. My Interpretivist curiosity to understand why, has not only resulted in better delivery of BA in the organisation, but is also the motivation for this research thesis – why are we interested in developing BA (outer layer), asking questions like why does this work and why does this not work led to the creation of the BAR (inner layer), why have I been able to achieve what I have to date, what are the important things to focus on in my role (core leadership layer), which are all questions I am looking to answer for myself, and if by conducting this research also provide answers for others, then all the better.

Research Context

It is within the context of the HEINEKEN organisation that this research was carried out, learnings identified, and impact realised. Throughout the period of the research, I held BA leadership roles in HEINEKEN, initially until 2021 in the Ireland Operating Company (OpCo) as Analytics Manager, and since 2021 in the Africa & Middle East Region (AME) as the Head of Data & Analytics.

HEINEKEN was established by Gerard Adriaan Heineken in Amsterdam in 1864 and has since grown to being the largest brewer in Europe and the second largest in the world. Still controlled by the Heineken family, it is the world's most international brewer and is the leading developer and marketer of premium and non-alcoholic beer and cider brands. Led by the Heineken® brand, the Group has a portfolio of more than 300 international, regional, local and specialty beers and ciders which are sold in over 190 countries. With over 90,000 employees, HEINEKEN operates a decentralized OpCo (Operating Company) centric model with local OpCos in the markets where it operates. It has local production

facilities such as breweries, malteries, cider plants and other production facilities in more than 70 countries.

While regarded as at the leading edge in areas such as marketing and product innovation, HEINEKEN could be considered until recently as quite a 'Traditional Organisation', particularly in terms of data driven decision making. It was established well before the digital era, with resultant embedded organisational culture and established business processes and ways of working. People tended to have long tenure in their roles and given the commercial success of the organisation, no particular 'burning platform' or impetus to change from intuition-based decision making to data-driven decision making. BA technology focus was on minimising cost while enabling adequate reporting rather than utilising the latest technology to unlock value from data, and the data across the organisation was unharmonized of inconsistent quality. None of this is surprising as the organisation was not a data or digital company but was a beer company, and I expect (based on my previous experiences in other FMCG/CPG organisations) common across other 'Traditional' organisations.

It is HEINEKEN's strategic ambition to become the best-connected, most relevant brewer, for customers and consumers living in the digital age. To achieve this, it is undergoing a digital transformation which it refers to as "becoming the best-connected brewer", which involves digitally transforming the business and modernising the technology landscape at the same time. Central to this overall digital transformation is a significant step up in data & analytics capabilities as in the words of the CEO, "we must make data part of our DNA and create data-driven insights to create value".

HEINEKEN Ireland

The HEINEKEN OpCo in Ireland was established in 1856 when James J Murphy and his brothers sold their Midleton Distillery and established the Ladyswell Brewery in Cork. Murphy's Brewery joined the HEINEKEN Company in 1983, and since then has grown its share of the Irish market to become one of Ireland's leading beer & cider companies. HEINEKEN Ireland employs over 400 people

and produces a portfolio of household name brands including Heineken®, Coors, Heineken®0.0%, Birra Moretti, Orchard Thieves, and a range of stout, craft and variety beers, with the portfolio generating annual sales of over €1bn at retail level.



Picture 2: HEINEKEN Ireland's Ladyswell Brewery in Cork has been operating since 1856. Beer still leaves the brewery through this gateway today.

Paper 1 of this research explores in some detail the organisational context in terms of the HEINEKEN Ireland OpCo, particularly the evolution of the organisation's BA capability over a ten-year period from 2011 to 2020. The BA maturity of the organisation was assessed through the lens of Davenport & Harris (2017) DELTA framework and over the course of the ten-year period under review the organisation matured from a pre-dominantly 'Analytics-Impaired' organisation to a pre-dominantly 'Analytical Company'. This represents developing from Stage 1 to Stage 4 of the five stages as per the DELTA framework and took place across four (coincidentally) eras dubbed 'Awakening', 'Building & Exploring', 'Advancing' and 'Leveraging'. A summary of the progression across the DELTA capability elements from Era 1 to Era 4 is outlined in Table 4.

Capability Element	Era 1: Awakening (2011 – 2012)	Era 4: Leveraging (2019 – 2020)
Data	Localised Analytics (Stage 2) Efficient and robust collection of transactional data with transactional systems well integrated.	Analytical Company (Stage 4) External data (e.g., demographic) and unstructured (e.g., photos) routinely utilised for analytics use cases
Enterprise	Localised Analytics (Stage 2) Each function conducting its own analysis with its own domain specific data.	Analytical Company (Stage 4) D&A team takes on responsibility for all BA but remains under resourced. IT remains separate.
Leadership	Analytically Impaired (Stage 1) Little knowledge of or interest in BA. No burning platform.	Analytical Company (Stage 4) Senior leaders embrace BA and role model data-driven decision making
Targets	Analytically Impaired (Stage 1) Each function using localised BA for tactical decision making.	Analytical Competitor (Stage 5) BA a central element of HEINEKEN Ireland business strategy
Analysts	Analytically Impaired (Stage 1) No specific BA skills. Technology skills in IT, functions conducting analysis with basic excel.	Analytical Company (Stage 4) External recruitment for BA skills, Development of internal talents, Enhanced partnerships with 3rd Level institutions BA competency developed across organisation, beyond D&A team.
Technology	Analytically Impaired (Stage 1) Robust ERP with connected CRM and operational systems. Centralised data warehouse. BA primarily Excel.	Analytical Company (Stage 4) Cloud BA platforms. Open-Source predictive analytics.
Analytical Techniques	Analytically Impaired (Stage 1) Ad hoc basic Excel analysis.	Analytical Company (Stage 4) Advanced predictive analytics routinely used for decision making.

Table 4. HEINEKEN Ireland DELTA BA Capability Levels from 2011 to 2020

HEINEKEN Africa & Middle East Region

The first two papers of this PhD study analyse the HEINEKEN Ireland organisation, in which the BAR (Business Analytics Recipe) was developed and the organisation's journey as it built its BA capability, as well as looking at how the organisation advanced BA by identifying the critical success factors when implementing the BAR. Paper 3 follows on from HEINEKEN Ireland and looks at the BAR as it is scaled to a much higher level through refinement and utilisation at a regional level. This is a significant step up in terms of the scale and complexity of the organisational context as the AME (Africa & Middle East) Region is made up of 15 diverse OpCos and produces 25 times more beer than the Ireland OpCo.

The DELTA framework was utilised in Paper 1 as a lens to assess the BA maturity of the Ireland OpCo. Paper 3 focuses on the AME Region but there is not a comparative DELTA assessment of the AME Region included in any of the four papers. Therefore, I have included here my short DELTA assessment of the AME Region as of 2023. It is important to note that this is based on my overall assessment of the region at a high level. The AME region is much vaster and more diverse than the Ireland OpCo and in places is much more mature, but in other places is much less mature. For example, in South Africa, there are diverse and rich data sources, highly skilled BA teams, and data literate business decision makers and leadership with routine utilisation of advanced data science techniques to unlock significant value from data. However, in other OpCos in the region, they struggle with even the foundational challenges of data availability and quality. Therefore, my assessment across the DELTA framework capability elements is based at the overall prevalent maturity at the regional level rather than the highest or lowest OpCo levels.

Incidentally, it is this diversity amongst the OpCos across the AME region that led to the refinement of the BAR as a more rounded and generalisable tool. For example, the early versions of the BAR did not emphasise foundational elements such as Data Quality or even refer to ethical considerations, because in the

Ireland OpCo data quality was relatively high and the context was so small that it was possible for the Data & Analytics team which was involved and had visibility of the end-to-end business processes to keep control and govern the data, even without the need for formal governance and processes.

AME Region BA Maturity Assessment

Capability Element	Head of Data & Analytics Assessment 2023
Data	<i>Localised Analytics (Stage 2)</i> Efficient and robust collection of transactional data widespread but data management challenges prevail for non-ERP data. However, are some pockets of excellence with some OpCos using diverse, inc. external data sources routinely for advanced analytics use cases.
Enterprise	<i>Analytical Company (Stage 4)</i> BA technology stack standardised and managed at enterprise level, enterprise level data infrastructure deployed (during 2023) and enterprise (regional) hubs established for data management and analytics teams with standardised WoWs and BA processes.
Leadership	<i>Analytical Aspirations (Stage 3)</i> Senior leaders fully embrace BA and role model data-driven decision making, with signs of analytical mindset developing at middle management.
Targets	<i>Analytical Aspirations (Stage 3)</i> Focused BA activity on selected domains and targeted opportunities aligned with business strategic objectives. Outcomes still mostly delivering evolutionary impact but moving towards revolutionary impact on business performance.
Analysts	<i>Analytical Company (Stage 4)</i> External recruitment for BA skills along with development of internal talents. BA teams activity coordinated and focused on delivering BA strategy aligned to business strategy.
Technology	<i>Analytical Competitor (Stage 5)</i> Latest BA technology deployed in partnership with industry leading vendors including enterprise-wide big data & analytics architecture, cognitive technologies, prescriptive and autonomous analytics.
Analytical Techniques	<i>Analytical Aspirations (Stage 3)</i> Analytical techniques at the level of Analytical Competitor routinely deployed for prioritised use cases, but not yet widespread across the Region. Simple predictive analytics still the most prevalent techniques across the region.

Table 5. DELTA Capability Level of Africa & Middle East Region 2023

Compared to the Ireland OpCo, the AME Region is an organisation with much greater scale and complexity in the business operations. However, when it comes to maturing the organisational BA capability, the AME Region brings the additional complexity challenge of wide variation in maturity levels across the DELTA capability elements. As outlined in Table 4, the Ireland OpCo matured from a predominately Analytically Impaired organisation to a predominately Analytical Company, but as can be seen in Table 5, the maturity levels in the AME Region are more diverse, ranging from Localised Analytics (Stage 2) for Data to Analytical Competitor (Stage 5) for Technology. As mentioned above, the complexity is even greater when the diversity amongst the OpCos that make up the region is considered. For example, some of the less mature OpCos are Analytically Impaired for the Data Capability element as they lack the basic foundations of good data governance, but at the same time have access to the latest analytics technology releases as the technology landscape is no longer managed at the OpCo level but is centrally delivered. This level of scale, complexity and diversity means that it is more challenging and ultimately a slower process to mature the BA capability at the regional level than had been the case in the Ireland OpCo.

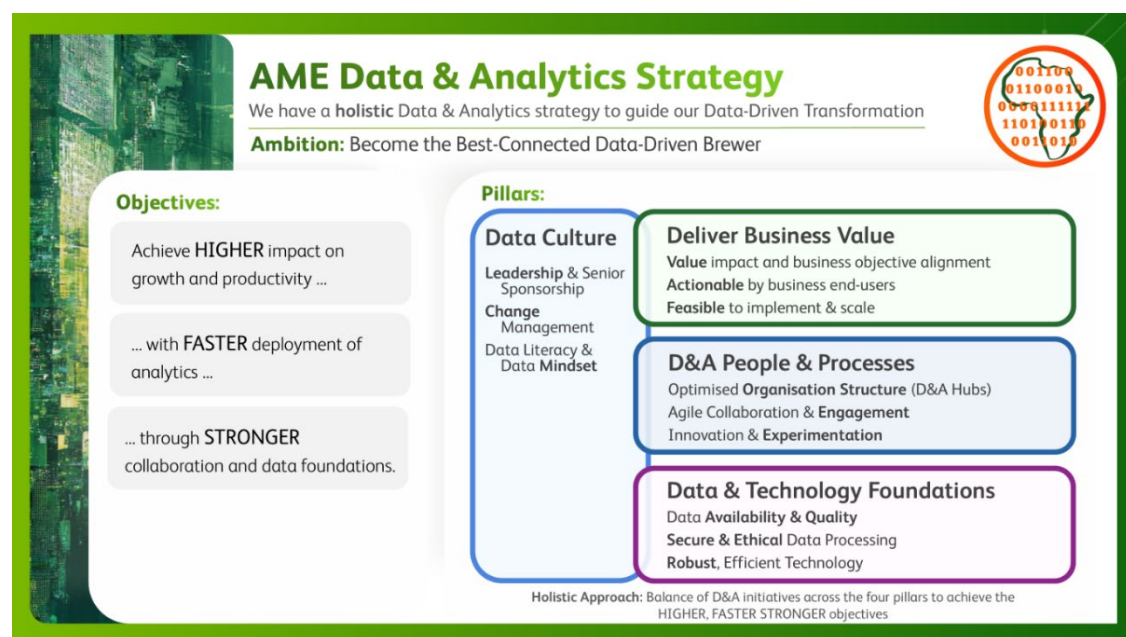


Figure 3: High level view of the HEINEKEN Africa & Middle East Data & Analytics Strategy, based on the Business Analytics Recipe (BAR)

Methodology

I have been fortunate enough to work in business analytics since 2006, when the discipline was still in its relative infancy and was far from widely adopted or understood. I say “fortunate” because I am in the enviable position of loving what I do. I get great personal satisfaction from my role as a BA leader as I believe in the transformative power of BA, the value it delivers to the organisation, and I take great pride in the impact on organisational performance delivered by the BA capability which I have played a leading role in creating. As a self-confessed interpretivist, I have been intrigued by the advancement of BA from a generally mis-understood and considered to be irrelevant phenomena (a previous line-manager of mine publicly referred to BA as ‘a fantasy’), to being an indispensable and core element of how organisations operate today. On a day-to-day basis, I have always been keenly interested to understand why some initiatives failed and others were unexpectedly successful in advancing the organisational BA maturity. Therefore, in conducting this PhD research I was mindful of several factors when it came to methodology selection, particularly given that the quality of research can be more impacted by the appropriateness of the selected method than the technical correctness of the method application (Evered & Louis, 1981; Ragab & Arisha, 2017). It was important for me to follow a research method which was aligned with my own research philosophy and allowed for continued reflection and sensemaking of my own observations, while taking advantage of the unique perspective and access to data afforded by my insider role leading my organisation’s BA capability building effort, and finally as a practitioner satisfying my desire to make contributions which are relevant to practice.

Method Selection

The research method employed in this thesis is analytic auto-ethnography, a qualitative approach that integrates personal experience with systematic analysis of the observed organisational phenomena. The decision to use analytic auto-ethnography as my primary methodology is justified by several factors related to my interpretivist-pragmatist philosophy, insider practitioner role,

nature of the organisational research context, and my research aspirations. In the next section I will outline the reasons for selection of analytic auto-ethnography, before going on to describe the analytic autoethnography method and applicability to this research.

Research Philosophy

The methodological approach in this thesis was guided by my philosophical perspectives of interpretivism and pragmatism. Interpretivism is an established research paradigm which acknowledges that humans are different from physical phenomena because they create meanings (Goldkuhl, 2012). In contrast to positivism, which emphasises statistical significance and generalisation to develop universal laws and findings, the interpretivist approach enables researchers to gain deeper insight into human experiences and perceptions within specific social contexts, producing knowledge that is intricately linked to the participants and context, resulting in rich, contextually situated understandings (Alharahsheh & Pius, 2020; Chowdhury, 2014; McChesney & Aldridge, 2019; Saunders et al., 2019). Analytic auto-ethnography is therefore well aligned with interpretivism as it emphasises my subjective experience and interpretation of reality within the social context.

Pragmatism focuses on finding practical, actionable insights that can be applied in real-world contexts and allows for flexibility in research approaches to integrate theory with practice (Creswell & Poth, 2016; Goldkuhl, 2012; Morgan, 2014; Saunders et al., 2019). This is particularly relevant in my case considering my dual role as both practitioner and researcher, where my goal is not only to understand but also to improve the BA capability and data-driven decision making in my organisation. As analytic auto-ethnography is oriented towards developing theoretical and practical insights that can inform both academic understanding and organisational improvement (Anderson, 2006), it is a suitable method in this case as it enables me to generate findings that are directly relevant to my own practice and the organisation's operations. Analytic auto-ethnography allows me to actively reflect on my experiences in practice, critically

evaluate them, and ideate actionable changes which I can implement in the organisation.

Practitioner Researcher

As an inside practitioner researcher, my deep familiarity with my organisation's BA processes, culture, and decision-making dynamics over 10 years presents a unique opportunity to generate both theoretical insights and practical improvements. While I recognise that there may be a certain stigma attached to practitioner research, I am of the view that by being embedded in the organisation and personally invested in the research subject, I am free to ask more relevant questions, have access to otherwise hard-to-reach populations, and make important connections, leading to a higher quality research (Jones & Bartunek, 2021). The challenges to personally relevant insider research typically come from positivist scholars who raise concerns around objectivity. However, from a pragmatist viewpoint, it is this proximity that can lead to much higher quality research. In my case my familiarity with the organisation and the social context means I am well placed to better contextualise observed behaviours and stories and therefore generate theoretical contributions which are not only more practically relevant but also better represent reality (Jones & Bartunek, 2021).

Analytic auto-ethnography is particularly suitable in this case as it acknowledges my insider practitioner-researcher role, allowing me to draw on my personal experience as a source of data while maintaining an analytical stance to critically engage with the organisation's culture and practices (Anderson, 2006). Unlike some forms of auto-ethnography that are primarily focused on personal storytelling, analytic auto-ethnography places a strong emphasis on connecting personal experience with academic theory and organisational practice (Anderson, 2006). This methodological approach is therefore well-suited to my goals of both understanding and improving the organisational BA practices.

Selection of Analytic Auto Anthography

For this research I opted to conduct a qualitative, longitudinal, inductive and abductive, analytic auto-ethnographic study, which as can be seen in Figure 4,

the 'Research Onion' (Saunders et al., 2019), is very appropriate given my interpretivist and somewhat pragmatic philosophy position. Interpretivism can underpin and inform a variety of research methods (McChesney & Aldridge, 2019) and while this overall thesis is guided by analytic auto-ethnography, I also take advantage of other mixed methods throughout the four papers as appropriate (for example survey in Paper 2) .

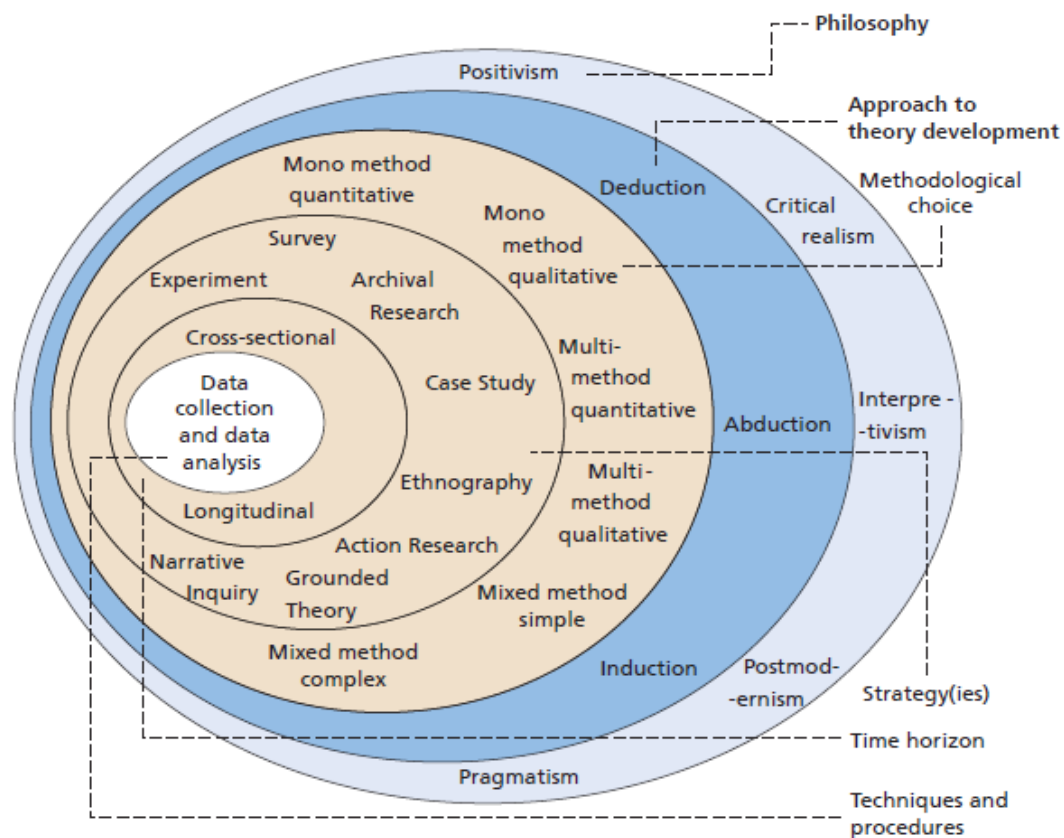


Figure 4: the 'research onion' (Saunders et al., 2019)

There are of course other qualitative methods such as action research or case study research which I could have used as the overarching method. However, given my contextual constraints and my own preferences (McChesney & Aldridge, 2019), analytic auto-ethnography provides me with the desired flexibility and freedom to do the more explorative research which I was interested

in, while leveraging the rich data source that is my >10 years of experience leading BA in the organisation.

Action research (AR) is a well-established collaborative research method that focuses on solving practical problems within an organisation, while generating knowledge through iterative cycles of diagnosing, action planning, action taking, evaluating, and specifying learning (Baskerville, 1999; Chiasson et al., 2009; Susman & Evered, 1978). AR is ideally suited to researching IS within the social organisational contexts and tends to produce research outputs which are very relevant to practice as the research is conducted in the real world setting and the researcher is involved rather than just being an external observer (Baskerville & Wood-Harper, 1996; Kock, 2004; McKay & Marshall, 2001). I have previous experience of utilising AR including when I was completing my MSc in 2015 and found that it aligns well with my interpretivist philosophy, dual role of practitioner researcher, and my desire to produce practically relevant outputs. In this research however, it was my ambition to be more explorative than interventionalist.

Case study research is a long established and commonly used method which involves data collection methods and allows for an in-depth exploration of complex phenomena within real-life contexts (Creswell & Poth, 2016; Ragab & Arisha, 2017; Taherdoost, 2022). Case studies are an appropriate method for capturing the knowledge of practitioners and have been widely used for exploration of social contexts for the purpose of theory building (Benbasat et al., 1987; Eisenhardt, 1989; Jaspers, 2007) and are more relevant for the study of contemporary rather than historical phenomenon (Yin, 2018).

Grounded theory is another research method which as can be seen in Figure 4: the 'research onion' (Saunders et al., 2019) is quite well aligned with my Interpretivism-Pragmatism research philosophy. There are several variations of grounded theory found in the IS literature (Flick, 2018; Matavire & Brown, 2013), but it is a well-established qualitative research method that involves inductively generating theory from a variety of systematically collected field data (Glaser,

2017; Goulding, 2005; Taherdoost, 2022; Wiesche et al., 2017). While the espoused purpose of Grounded Theory is generating theory, the method is also used for other purposes such as model building and creating descriptions of IS phenomena (Wiesche et al., 2017). In conducting this research, I have followed an approach which shares some of the characteristics of grounded theory. The method for Paper 4 was heavily influenced by the Gioia Methodology (Gioia et al., 2013), which while differing from Grounded Theory in a number of ways, such as the use of theoretical frameworks, is also an inductive theory building approach.

Survey research is one of the most common quantitative methods for studying organisations, particularly for gathering large-scale quantitative data on attitudes, perceptions, and behaviours (Palvia et al., 2003; Ragab & Arisha, 2017; Taherdoost, 2022). While I do utilise the survey method (Paper 2), this is not in a positivist sense of collecting quantitative data as the primary data source, but rather as a method of engaging and capturing the inputs of key informants (to assess the validity of the inductively developed critical success factors).

When it came to the methodology for this thesis, I had several options and could have framed the research as Action Research, Case Study or Grounded Theory but it was important to me that the selected method allowed me flexibility and freedom to be explorative, while also providing a framework to ensure academic rigour. While relevance to practice was certainly important, and I did produce artefacts, such as the BAR (Business Analytics Recipe) and intervene in the organisation, (for example implementing changes resulting from Data Value Map analysis – paper 3) , these were not my primary focus. My primary motivation for this research was rather the exploration and understanding of my own experiences developing the organisational BA capability. Furthermore, I also engage in a lot of reflection in this research, so needed the flexibility to go back over my story spanning more than 10 years. While the individual papers utilise mixed methods, analytic auto ethnography was chosen as the common thread through the overall thesis as it met my research requirements.

Analytic auto-ethnography, as defined by Anderson (2006), is a qualitative research method that combines the richness of personal experience with the analytical depth required for academic rigor. This methodology is particularly suitable given my insider status and extensive experiential knowledge of business analytics within the organisation. Auto-ethnography allowed me to leverage my embedded perspective, offering insights into organisational processes, decision-making, and the role of business analytics that would be inaccessible to an external researcher. The interpretivist focus of this method aligns with the subjective, context-specific nature of my research, allowing me to construct meaning from my lived experience and interactions within the organisation (Ellis et al., 2011). Furthermore, the analytical component ensures that my personal narrative is systematically interrogated and linked to broader theoretical frameworks, thus addressing concerns about subjectivity and bias often associated with auto-ethnography (Wall, 2006). In the next section, I will look at analytic autoethnography in more detail and how I applied it in conducting this research.

Overview of Analytic Autoethnography

Autoethnography is a research approach which allows for the systematic analysis of the researcher's personal experiences, and is particularly suited to articulating the 'insider knowledge' of the researcher which may not be accessible to 'outsider' researchers (Adams et al., 2017; Ellis et al., 2011). While it first appeared in the 1970s, autoethnography has become increasingly popular as a postmodern research method (Adams et al., 2017; Le Roux, 2017).

Another consideration for me is that as a practitioner researcher, it is important that this research be relevant to practice. The storytelling of personal and interpersonal experiences tends to produce research which is more accessible to non-academic practitioners so is likely to reach a wider practitioner audience than some other more traditional research methods (Adams et al., 2017; Ellis et al., 2011)

The two main approaches to autoethnography are ‘evocative’ which relays the narrative to be interpreted by the reader, and ‘analytic’ which combines the researcher’s experiences with social science theories to construct an interpretation of those experiences (Struthers, 2014). While it may not be a requirement to include the analysis element to complete legitimate autoethnographic research (Ellis & Bochner, 2006), the differentiating feature of analytic autoethnography as proposed by Anderson (2006) is that it includes an explicit analysis element to develop generalisable theoretical understandings from the recounted experiences (Ellis & Bochner, 2006; Struthers, 2014; Vryan, 2006).

Analytic autoethnography presents several advantages as a research method. The involvement of the researcher as a member in the social setting provides access to data, while the analysis of the researcher’s personal experiences and perceptions facilitates a deep exploration to better inform our social understandings, and also enrich self-understanding (Anderson, 2006)

In conducting this research, I chose to adopt the analytic autoethnographic approach as the principal methodology at the overall thesis level, while also utilising complimentary approaches such as the Gioia (2013) Methodology where relevant. Analytic autoethnography was selected because given my position as an embedded practitioner researcher and the nature of my research, it was particularly feasible to align with the features of analytic autoethnography as proposed by Anderson (2006), while also meeting my dual objectives of developing an understanding of my own lived experiences, while also producing practitioner relevant research which would be useful to others and applicable in other organisational contexts.

Features of Analytic Autoethnography

Analytic autoethnography contains five key features as proposed by Anderson (2006), namely (1) complete member researcher (CMR) status, (2) analytic reflexivity, (3) narrative visibility of the researcher’s self, (4) dialogue with informants beyond the self, and (5) commitment to theoretical analysis. In the

following paragraphs I outline Anderson's (2006) five key features of analytic autoethnography as they applied to this thesis.

Complete Member Researcher (CMR)

A feature of autoethnography is that the researcher is a complete member in the social world under study and it is not uncommon that the group membership precedes the decision to conduct the research. The fact that the researcher is also a full member of the community under study presents the obvious methodological advantage of providing access to data which would not otherwise be the case (Anderson, 2006). Additionally, as the research is not the only, nor necessarily even the primary incentive for the researcher to spend time in the field, this can enable the researcher to spend more time in the field gathering more data over an extended time (Anderson, 2006).

This thesis researches the development of business analytics capability in a traditional organisation (HEINEKEN) over a ten-year period. During that time, I held roles which were responsible for driving the BA capability which placed me at the centre of the social setting and provided access to data in the form of first-hand experiences. Over the period of the research, I was fortunate to hold such positions at two levels in the organisation, initially at the OpCo (Operating Company) level in Ireland and since 2021 at the regional level in Africa & Middle East. While the reason for the role change was not driven by this research requirements, it was fortuitous as it provided an opportunity for the research to benefit from access to data across two different organisational contexts.

Analytic Reflexivity

As complete members of the social world being researched, it is important for autoethnographic researchers to be aware of their position in it and their own impact on the social setting being researched (Le Roux, 2017). As the leader responsible for leading the development of organisational BA capability, there was significant alignment between my own objectives, the organisational objectives and my motivation for completing the research.

Throughout this thesis, the research has been conducted through collaborative reflection (between me and both supervisors) facilitated by my autobiographical phenomenological accounts. These accounts include my narrative of experiences as the Ireland OpCo developed its BA capability from 2011 to 2020 (referred to as The Big Monkey) which served as data source for papers one and two, the account of twelve representative stories from my experiences between 2011 and 2023 in my Ireland and AME roles (referred to as The Small Monkey) which served as the data source for Paper 4, and my reflections on the output from the Data Value Map analysis featured in Paper 3.

[Narrative Visibility of the Researcher's Self](#)

According to Anderson (2006), one of the features of autoethnography is that *“the researcher is a highly visible social actor within the written text”*. As opposed to being an ‘undercover’ observer, the personal experiences and feelings of the researcher need to be incorporated into the story as a vital data source for understanding the social world being researched (Anderson, 2006).

Throughout this thesis and in each of the four papers it is called out that I am a key informant, or it is my work as described in the narrative that the research is based on. Paper 1 tells the story of the Ireland OpCo based on my lived experiences and my assessment of BA maturity utilising the DELTA Framework. In Paper 2, not only are the CSFs derived from the analysis of my autoethnographic accounts, but I offer in the paper my perspective on the relevance of each CSF. Paper 3 goes so far as to contain an entire section (stage three of the research) devoted to me outlining my perspective of the eight black boxes identified and mapped to the Data Value Map from the other key informant's interviews. And Paper 4 is based on my twelve first person accounts of experiences in both the Ireland OpCo and AME Region and not only are details of the stories contained in the paper, but I outline my motivation for telling each of the stories in the paper.

Dialogue with Informants Beyond the Self

According to Anderson (2006), analytic autoethnography, while grounded in the researcher's own experiences, needs to reach beyond those experiences as well. A failure to adequately engage with informants and data beyond the self raises the potential for self-absorption on the part of the researcher who may lose sight of the wider social context which is being studied. However, the proposal for this "dialogue with informants beyond the self" as a requirement for analytic autoethnography is not unanimous in the literature. While including dialogue from other informants may certainly increase the trustworthiness of the analysis (Struthers, 2014), it is not a necessary requirement in all cases, as it is also feasible to produce analytic autoethnographic research and to generalise the findings based on the experiences of a single individual (Gioia et al., 2013; Struthers, 2014; Vryan, 2006).

In conducting this research, I rely extensively on my own experiences as a CMR and utilise my own key informant stories as data. However, throughout the research I have always been conscious to incorporate an element of dialogue beyond myself. At a minimum, my role as BA leader in the organisation entails collaborating with other stakeholders in the organisation such as my own teams, senior leadership and other cross functional colleagues. Their viewpoints and assessments of the various BA activities and initiatives not only influenced my own views but also directly contributed to the actions taken and the resultant impact of those actions in the organisation. In addition, the development of each of the four papers in this thesis arose from a collaborative process with engagement and dialogue with my two supervisors. As external (to the organisation) research team members, they were able to critically assess, clarify, and challenge the narrative which I put forward. This was done in various ways such as assessing and challenging the autobiographical phenomenological accounts which I shared with them and through a series of regular (weekly or fortnightly) collaborative reflection sessions held throughout the research period.

Furthermore, the dialogue with and inclusion of key informants other than myself is even more explicit in some of the papers. For example, in Paper 2, the critical success factors identified through analysis and coding of the autoethnographic narrative were then validated by conducting a survey amongst key stakeholders from the organisation. When writing Paper 3, the basis of the Data Value Map (DVM) assessment was interviews conducted by the two independent research team members with ten key informants from the organisation, while the output of the analysis was then discussed with a wider group of stakeholders from the AME region during a workshop discussion facilitated by the two independent research team members.

While differing methods of conducting dialogue with informants beyond myself were utilised throughout this thesis, I was always conscious to incorporate outside voices to validate and challenge the outputs being produced.

Commitment to Theoretical Analysis

The definitive feature of analytic autoethnography is, according to Anderson (2006) the “*quality of not only truthfully rendering the social world under investigation but also transcending that world through broader generalization*”. To facilitate this generalisation, I have utilised theoretical lenses to analyse the data whether that data was obtained from my own autoethnographic accounts or interviews with other key informants.

The theoretical lenses are utilised in different ways throughout this thesis. For example, in Paper 1, the autoethnographic story is structured using the DELTA model proposed by Davenport and Harris (2017) to show the movement in stages of the organisation (from *Analytically Impaired* to *Analytical Competitor*) across the seven capability elements (*Data, Enterprise, Leadership, Targets, Analysts, Technology, Analytical Techniques*). The output of this analysis itemises the seven capability elements across the HEINEKEN Ireland journey of maturing a BA capability, which is presented across four eras (*Awakening, Building & Exploring, Advancing, Leveraging*). In Paper 3, the emerging themes from the key informant interviews were analysed through the lens of and mapped to the Data Value Map from Sammon & Nagle (2017). This visualisation

was then used to build a shared understanding amongst the wider AME D&A team members. While in Paper 4, the abductive Human In The Loop approach leveraged data (in the form of my 12 BA Leader stories) and theory (leadership behaviours from Yukl (2002) and leader archetypes from Korherr et al. (2022)) to produce 4 thematic leadership taglines (“build skills, drive insights, foster innovation”, “empower teams, foster collaboration, achieve impact”, “drive culture, adapt strategy, integrate technology”, and “lead innovation, advocate data, drive change”). These four thematic leadership taglines contribute to BA leadership theory by conceptualising the remit of a BA leader, looking to bridge the Analytics strategy-execution gap within a traditional organisation.

Analytic Autoethnography Feature	Paper 1 - How a Traditional Organisation Matured a Business Analytics Capability	Paper 2 - Bake the Cake: How a Traditional Organisation Delivers Impactful Analytics	Paper 3 -Unpacking the ‘Black Boxes’ of Analytics: A Data Value Map Analysis	Paper 4 - Bridging the Analytics Strategy-Execution Gap: An Analytics Leader’s Story
Complete Member Researcher	Held roles of Analytics Manager in HEINEKEN Ireland and Head of Data & Analytics in HEINEKEN Africa & Middle East Region, both of which were responsible for driving the BA capability in the respective organisations and positioned as a complete group member in each setting. Overlap in motivations across ‘day job’ of successfully developing organisational BA capability and research motivation of understanding how to develop organisational BA capability.			
Analytic Reflexivity	Analysis by both self and independent research team members of reflective account of own personal experiences over ten-year period – 2011 to 2020 (referred to within the research team as The Big Monkey)		Data from semi-structured key informant interviews reflected on by me and analysed through lens of DVM.	Twelve stories of own experiences are analysed to identify the remit of BA leaders.
Narrative Visibility of the Researcher’s Self	Paper is an account of the lived experiences as Ireland OpCo developed BA capability and is called out in paper as based on <i>“The ongoing documenting and analysis of the first author’s personal experiences“</i>	Twelve CSFs are proposed and own perspective on why CSF is important is called out in paper for each, along with own experience of addressing each CSF.	Following the DVM workshop with stakeholders, the identified key concepts (eight ‘black boxes’) along with the status of each was reflected upon by me and my perspective shared as stage three of the research paper.	Reflexive writing of 12 stories of own experiences including the organisational impact which were significant in the development of BA capability of the Ireland OpCo and AME Region organisations. Own motivation for selecting and telling each story is described in the paper.

Analytic Autoethnography Feature	Paper 1 - How a Traditional Organisation Matured a Business Analytics Capability	Paper 2 - Bake the Cake: How a Traditional Organisation Delivers Impactful Analytics	Paper 3 -Unpacking the ‘Black Boxes’ of Analytics: A Data Value Map Analysis	Paper 4 - Bridging the Analytics Strategy-Execution Gap: An Analytics Leader’s Story
Dialogue with Informants Beyond the Self	Autoethnographic accounts analysed by two independent members of research team on an ongoing basis to provide ‘outside-in’ view and questioning of the story, assumptions and decisions therein.	Autoethnographic accounts coded by two independent members of research team to identify CSFs which were then evaluated by key stakeholders in the organisation using online survey.	Ten organisational key informants interviewed by the two independent research team members to populate the Data Value Map template. Workshop discussion was held with wider group of stakeholders to discuss output of DVM analysis.	Twelve autoethnographic stories discussed with and analysed by two independent members of research team.
Commitment to Theoretical Analysis	The development of Ireland OpCo BA maturity is analysed through the lens of Davenport & Harris’s (2017) DELTA Framework.	Analysis and coding of autoethnographic narrative produced 12 Critical Success Factors for developing BA capability in traditional organisations.	Stories of key informants are mapped to the Data Value Map discursive template (Sammon & Nagle, 2017) to help identify gaps between BA strategy and execution.	Abductive approach to identify thematic concepts which conceptualise the remit of a BA Leader, from coded topics extracted from 12 autoethnographic stories leveraging analysis through the lens of Leadership Behaviours (Yukl et al., 2002) and Leader Archetypes (Korherr et al., 2022)

Table 6: Alignment with features of analytic autoethnography

Contributions

This thesis followed an analytic autoethnographic approach to explore the field of Business Analytics (BA) through detailed analysis of the experiences of a large traditional organisation navigating the complexities of developing, implementing, and sustaining data-driven capabilities. The research comprised of four distinct but interconnected papers, which make impactful contributions to both theory and practice as outlined in Table 7. Contributions to theory include refined models for understanding BA capability development, the identification of CSFs for BA success, frameworks for addressing the strategy-execution gap, and leadership theories specific to BA. From a practical perspective, the research provides actionable tools and strategies for BA leaders to enhance their BA efforts, deliver impactful results, and foster their own leadership to drive successful BA transformations in their organisations. The four papers taken together provide an insight into the development of organisational BA capability over a thirteen-year period from 2011 to 2024. Beyond the individual contributions of the four papers, is the overarching contribution of the Decision Dynamics Matrix which provides insight into the evolution of decision-making over a sustained period from gut-based decision making to initially data-informed, before ultimately advancing to data-driven decision making.

Paper Contributions to Academic Theory

The papers in this thesis make several key contributions to the academic theory on business analytics and its development in (particularly traditional) organisations.

Business Analytics Capability Development

Paper 1 contributes to the theoretical understanding of how organisations mature their BA capabilities by providing a detailed examination of the HEINEKEN Ireland journey. By applying the DELTA model, this in-depth research highlights the dynamic, context-dependent nature of BA maturation. The iterative and reflective nature of the journey provides theoretical insights into the challenges and key factors—such as data robustness, enterprise adaptability, and leadership involvement—that influence BA success. This contributes to the literature on organisational learning and the evolution of BA in large, traditional organisations.

Critical Success Factors (CSFs) in Business Analytics Transformation

Paper 2 introduces and conceptualises twelve CSFs, structured around the Business Analytics Recipe (BAR) framework, that are essential for delivering impactful BA in traditional organisations. These CSFs provide a theoretical framework for understanding the interplay between strategic vision, leadership, and BA execution. By grounding the CSFs in practical, real-world settings and aligning them with relevant theoretical constructs, such as importance and relevance in Information Systems (IS), the paper extends the existing research on the success factors for BA implementation.

Business Analytics Strategy-Execution Gap

Through the application of the Data Value Map, Paper 3 contributes to organisational theory by providing a structured method to diagnose and address the gaps between BA strategy and execution in a traditional organisation. The research highlights that aligning strategic intent with execution requires not just technical readiness but also a focus on cultural and operational readiness within the organisation and uncovers the insight that execution gaps are not static but evolve with shifts in organisational capacity, reinforcing the need for flexible and adaptive strategies in BA transformations.

Business Analytics Leadership

The new lens developed from the abductive "human-in-the-loop" approach in Paper 4 contributes to the theoretical understanding of the role played by BA leaders in leading data-driven organisational transformations. The emergence of four thematic leadership taglines—"build skills, drive insights, foster innovation", "empower teams, foster collaboration, achieve impact", "drive culture, adapt strategy, integrate technology", and "lead innovation, advocate data, drive change"—provides a new conceptualisation of the role of BA leaders in traditional organisations. These themes align with established leadership theories and add depth by demonstrating how analytics-specific leadership can bridge the strategy-execution gap. It highlights the multifaceted role of BA leaders in aligning technological advancements with organisational culture, while also fostering an environment conducive to innovation and data-driven decision-making.

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Paper (Contribution)	Contribution to theory	Contribution to practice
Paper 1 - How a Traditional Organisation Matured a Business Analytics Capability BA Capability (P1, P2, P3, P4)	Contributes to the theoretical understanding of how organisations mature their BA capabilities by providing a detailed examination of the HEINEKEN Ireland journey. By applying the DELTA model, this research highlights the dynamic, context-dependent nature of BA maturation.	Key watchouts be considered by BA Leader practitioners in other similar organisations as they embark on their own journeys to become “Analytical Competitors”.
Paper 2 - Bake the Cake: How a Traditional Organisation Delivers Impactful Analytics (P2)	Conceptualisation of the CSFs to deliver impactful BA in a traditional organisation. Advances understanding of BA maturity development by identifying not only the elements necessary for success but also the interactions between these elements, organised in the BAR (Business Analytics Recipe)	Puts forward 12 Critical Success Factors as a tool for practitioners to evaluate their respective efforts in delivering impactful BA by undertaking a self-assessment exercise on the presence or absence of the CSFs documented in the paper.
Paper 3 -Unpacking the ‘Black Boxes’ of Analytics: A Data Value Map Analysis (P3, P4)	Contributes to organisational theory by providing a structured method to diagnose and address the gaps between BA strategy and execution in a traditional organisation. Uncovers insight that execution gaps are not static but evolve with shifts in organisational capacity, reinforcing the need for flexible and adaptive strategies in BA transformations.	Offers a pragmatic approach for organisations struggling with the execution of their BA strategies. By diagnosing the implementation gaps and adjusting the focus from scalability to feasibility, this research provides a roadmap for more effective and sustainable strategy execution.
Paper 4 - Bridging the Analytics Strategy-Execution Gap: An Analytics Leader’s Story	Application of innovative abductive "human-in-the-loop" approach which contributes to the theoretical understanding of BA leadership in transformative BA environments and bridges the gap between BA leadership theory and BA practice, particularly on how BA leadership shapes and drives technological and cultural transformations in traditional organisations.	Practical guide for BA leaders encapsulated within four thematic taglines, which offer a clear roadmap for leaders seeking to bridge the BA strategy-execution gap.

Table 7: Key contributions by paper

Paper Contributions to Practice

The findings from this research also provide actionable insights and frameworks that are directly relevant to practitioners seeking to enhance the BA capabilities of their organisations.

Practical Lessons from BA Evolution

The lessons drawn from HEINEKEN Ireland's BA journey in Paper 1 offer several key practical recommendations for other organisations as they mature their BA capabilities. The key watchouts—such as avoiding data distractions, aligning BA activities with strategic objectives, and fostering a data-driven culture—offer pragmatic advice to organisations embarking on similar journeys. The research also underscores the importance of leadership commitment, enterprise adaptability, and incremental technology investment, which are vital for avoiding common pitfalls in analytics transformations. Furthermore, the emphasis on a holistic, evolving approach provides practical guidance for organisations at various stages of BA maturity.

Application of Critical Success Factors for Business Analytics

Paper 2 offers a practical framework for organisations to evaluate their BA efforts. By socialising, assessing, and defining a plan based on the 12 CSFs identified, practitioners can systematically advance their BA capabilities. The self-assessment exercise recommended in this research provides a straightforward yet effective tool for BA leaders to raise awareness about critical factors that may have been overlooked.

Strategy-Execution Alignment in Business Analytics

The Data Value Map (DVM) analysis presented in Paper 3 offers a pragmatic approach to practitioners for assessing and correcting the implementation of their BA strategies. By using the DVM, organisations can identify areas where their strategies are misaligned with execution and implement targeted course corrections. The adjustment of use-case prioritisation criteria in HEINEKEN (shifting from scalability to feasibility) is an example of how this framework can drive practical, on-the-ground changes to improve BA effectiveness and sustainability.

Leadership Guidance for Business Analytics Transformation

The BA leadership insights from Paper 4 provide a practical guide for BA leaders navigating transformation within traditional organisations. The four thematic leadership taglines offer a clear, actionable framework for driving analytics success by focusing on skills development, fostering collaboration, integrating technology, and advocating for data-driven decision-making. The practical recommendations, such as empowering teams through training and fostering a data-driven culture, are designed to help practitioners navigate the complexities of digital transformation, making it highly relevant for practitioners tasked with leading analytics transformations.

I have been disseminating these research results at European and African data practitioner conferences with attendees from numerous industries. In one particular conference (CDAO Europe 2024 - <https://cdao-eu.coriniumintelligence.com/>), I presented the findings from Paper 4, which garnered significant interest and feedback. As an example, see in Figure 5 a LinkedIn post of one reflection of this research from an analytics leader (who was unknown to me prior to the conference) that has worked in an energy company and financial services.



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I was at the #CDAOEurope conference this week. Many topics were great. One presentation that triggered me was from [REDACTED] (the Heineken company). The topic is the role of data & analytics leader. Four stereotypes of analytics leaders were discussed: Analytical Thinker, Coach, Guide, and Strategist. I reflected on the data analytics leaders I encountered in my career, the selection of leaders in this area I have seen, debated with myself which of the four are the most important for a successful data analytics leader. I feel like sharing some thoughts here.

If I were to rank the four, Strategist would rank first. We lead our teams with a strategy, a purpose, a direction. In such a fast-changing field, it is key that we as strategists set up a direction, which is the pre-condition for choosing the right technology, people and right opportunities to work on. We need to have a good balance between being strategic and getting the operational work done, but our mission is not to use technology to run operations only.

Analytical Thinker would rank second for me. Not every talented person can be a data analytics leader. Data analytics as a field is content heavy. Even though not every good data scientist can become a good data analytics leader, having deep understanding of the content, the potential of the technology and what it takes to get things done are key to success. The Analytical Thinker role may sound task-driven but is not something that can be missed. It is also the role that distinguishes data analytics leaders from leaders in other fields.

The successful data analytics leaders I encountered are almost always a combination of being a Strategist and being an Analytical Thinker.

What is your view on characteristics a data analytics leader should have?

Figure 5: LinkedIn post from a Data Practitioner inspired by this research

How organisations progress from Gut-Driven to Data-Driven

The four papers within this thesis make impactful contributions to both academic theory and practice in the realm of business analytics. Collectively, these contributions offer a comprehensive understanding of how traditional organisations can navigate the complexities of becoming data driven. This brings me to the purpose and the impact of this research. It is all very well to develop an organisations BA capability, but ultimately, the purpose of doing so is to

transform the organisation from a predominately gut-driven organisation to a data-driven organisation with the resultant improved business performance.

Action Taken based on Data or Gut-Feel

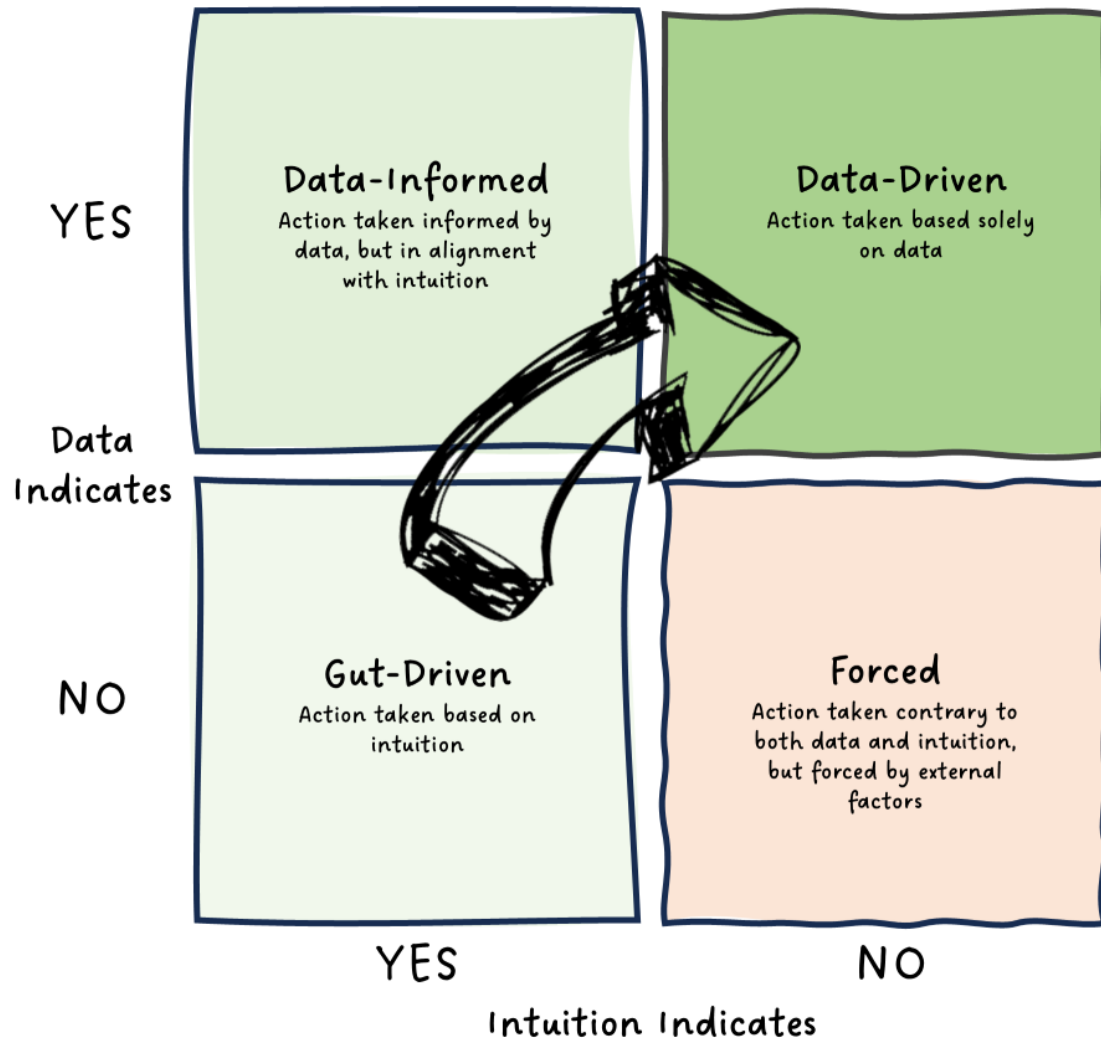


Figure 6: Decision Dynamics Matrix: Progression of Decision Making

This research is somewhat unique in that it covers the organisational development of BA capability over a thirteen-year period. A key finding to emerge from the research of the organisational BA capability over that time is that the organisation did not transform directly from predominately gut-based to data-driven. The trajectory of the maturing of BA in HEINEKEN Ireland followed the arrow as shown in the **Decision Dynamics Matrix** (Figure 6). Decision makers, either individually or in teams, had tended not to migrate from gut-driven to data-

driven without passing through a period of data-informed decision making. Therefore, the aim of any BA capability building effort is to **'bring the arrow to life'** (in Figure 6), and the evaluation of the success of such efforts needs to be determined by the movement along the arrow towards data-driven decision making.

The Decision Dynamics Matrix along with the other contributions from the research are unpacked in more detail later in Chapter 6, while over the next four chapters I share the research papers which make up this thesis.



Picture 3: A selection of the HEINEKEN portfolio available in South Africa (2024)

Chapter 2 HOW A TRADITIONAL ORGANISATION MATURED A BUSINESS ANALYTICS CAPABILITY

Paper Summary

Paper Summary Chapter 2 - Organisation How a Traditional Organisation Matured a Business Analytics Capability			
Peer Review	Analysis Method	Key Data	Key Contribution
UK Academy for Information Systems Conference 2023	DELTA Business Analytics Maturity Model	BA Leader first person autobiographical phenomenological accounts.	Watchouts to be considered as organisations embark on journeys to become “Analytical Competitors”

Abstract

This paper tells the story of how a large traditional CPG (consumer packaged goods) organisation in Ireland (HEINEKEN) established a transformative and award-winning Business Analytics (BA) capability inside a 10-year period.

Through analysing this story, told through the ‘lived experiences’ of the HEINEKEN Ireland Data and Analytics (D&A) Manager (the lead author), the obstacles to maturing a BA capability and the strategies to overcome them are revealed across four eras (awakening, building & exploring, advancing, leveraging). The analysis is structured using the DELTA model proposed by Davenport and Harris (2017), with the ‘Targets’, ‘Leadership’, and ‘Analysts’ capability elements featuring prominently in the HEINEKEN Ireland story.

Overall, our analysis and findings lead to seven key messages (across the DELTA capability elements) that should inform an organisation’s BA strategy. These messages afford IS professionals (academics and practitioners) with the opportunity to learn from HEINEKEN Ireland’s experiences as part of their evolving BA success story.

Keywords: Business Analytics, Traditional Organisation, Transformation, Capability, Reflective Practice

Introduction

Business Analytics (BA) has been attracting a lot of attention amongst both the researcher and practitioner communities in recent years, with data being described as the new oil, the new soil, the next big thing, and one of the organisation's most valuable resources (Hindle et al., 2020; Mikalef et al., 2020; Ransbotham et al., 2016). The organisational capability to leverage data and produce BA which are actioned to deliver improved business performance is now recognised as a competitive differentiator for organisations across most industries (Akhtar et al., 2019; Bumblauskas et al., 2017; Davenport, 2006), leading to senior executives making conscious efforts to transform their organisations to become data-driven (Delen & Ram, 2018; LaValle et al., 2011b).

There are many terms used in the literature to refer to the use of data for decision making. Davenport and Harris (2017, p. 25) put forward their definition of BA as *“the extensive use of data, statistical and quantitative analysis, explanatory and predictive models, and fact-based management to drive decisions and actions”* while Baesens et al. (2016, p. 808) define BA as *“all aspects of the data process to facilitate predictive and/or causal inference-based business decision making”*. These definitions do not distinguish between data ('big' or 'small') and include all types of analytics such as *descriptive*, *predictive*, and *prescriptive*, while emphasizing the actionability and business decision making purpose of BA. Organisational capability is an intangible concept but has been defined by Ulrich and Smallwood (2004, p. 119) as *“the collective skills, abilities, and expertise of an organisation, which represent the ways that people and resources are brought together to accomplish work”*.

Despite the efforts to develop BA capability, organisations are still struggling to become data-driven and are failing in their efforts to implement BA (Davenport & Redman, 2020; Klee et al., 2021; Smith et al., 2019), with issues such as organisational structures, culture, people capability, and technology getting in

the way of progress (Chuah & Wong, 2011; Redman, 2021; Smith et al., 2019). Many ‘traditional’ organisations, which were established long before the digital era and whose success to date has been delivered by non-digital business models, organisational structures, and culture, have been particularly slow in implementing BA (Cao & Duan, 2017), as they face the additional challenge of being impeded by the traditional structures and processes which had worked for them in past (Gust et al., 2017). Nevertheless, even these traditional organisations are now looking to catch up (Angevine et al., 2021) and the leading ones are demonstrating that they are able to capture value when they do successfully implement BA (Benavides et al., 2017).

This paper tells the story of the HEINEKEN Ireland journey, a large traditional CPG organisation, as it established a BA capability and identifies how to overcome some of the obstacles encountered on the journey. Our motivation for such an approach is practice-inspired, as we know that “*practitioners can relate to stories*”, and this is an effective way of “*making our research more relevant to practice*” (Myers, 2009, p. 218).

The remainder of this paper is structured as follows. In the next section we provide a background to the DELTA Model before outlining our research approach. We then present the story of HEINEKEN Ireland as it developed its BA capability and report our findings.

Background to the DELTA Model

The concept of maturity models has been widely adopted in IS research, with numerous BA maturity models developed recently, due to the increasing focus on BA by practitioners and academics, along with the usefulness of maturity models in guiding organisations developing their BA capability (Chen & Nath, 2018). The DELTA Model as put forward by Davenport and Harris (2017) is widely acknowledged as one of the most important and strongest BA capability maturity frameworks (Cosic et al., 2015; Lismont et al., 2017; Seddon et al., 2017).

The DELTA model was originally developed with five elements of BA capability, namely Data, Enterprise, Leadership, Targets and Analysts, but has been subsequently updated with the addition of Technology and Analytical Techniques (Davenport & Harris, 2017). We include a brief outline of the capability elements in Table 8. According to Davenport & Harris (2017, p. 181), *for a high-performing analytical capability, all the elements of the DELTA model need to be working together*. Therefore, organisations need to adopt a holistic approach to developing their BA capability and ensure that individual elements don't fall behind or advance too quickly (Davenport & Harris, 2017). As organisations advance from having virtually no BA capability to being true analytical competitors, there are five stages through which they can progress as identified by Davenport & Harris (2017) which are outlined in Table 9. Stages of Analytical Competition.

Capability element	Description
Data	Accessibility to high quality, diverse, dynamic data
Enterprise	BA resources managed and coordinated at an enterprise level
Leadership	Senior leaders which passionately advocate for BA and encourage a data-driven culture
Targets	Alignment of BA with strategic business priorities and focusing BA investments on the best high value areas
Analysts	Managing and developing BA talent including BA professionals and consumers of BA outputs
Technology	Providing the infrastructure, tools, and technologies to support BA
Analytical Techniques	Appropriate analytics techniques from basic descriptive techniques to advanced machine learning algorithms

Table 8. DELTA Model BA Capability Elements

Stage	Description
Analytically Impaired (Stage 1)	<i>Some desire to become analytical but thus far lack both the will and the skill to do so (Davenport & Harris, 2017, p. 65)</i>
Localised Analytics (Stage 2)	<i>Emphasis on reporting with pockets of analytical activity (Davenport & Harris, 2017, p. 65)</i>
Analytical Aspirations (Stage 3)	<i>Grasp the value and the promise of analytical competition, but they're in the early stages of it (Davenport & Harris, 2017, p. 64)</i>
Analytical Company (Stage 4)	<i>On the verge of analytical competition but still face a few minor hurdles to get there in full (Davenport & Harris, 2017, p. 63)</i>
Analytical Competitor (Stage 5)	<i>An organisation that uses analytics extensively and systematically to outthink and outexecute the competition (Davenport & Harris, 2017, p. 45)</i>

Table 9. Stages of Analytical Competition

In this paper we utilise the DELTA model as a lens to help tell the story of the HEINEKEN Ireland journey, a traditional organisation developing and maturing its BA capability. The next section presents our research approach.

Research Approach

This research follows a ‘*reflective writing*’ approach using auto-ethnographic accounts of the lead author (c.f. Olmos-Vega et al., 2022). From 2011 to 2020, the lead author was in the role of Data & Analytics (D&A) Manager within the case company (HEINEKEN Ireland). The ongoing documenting and analysis of the first author’s personal experiences (over this ten-year period – 2011 to 2020) is a very rich source of field data. More specifically, since 2016, the lead author has also conducted a series of ‘*self-interviews*’. Self-interviews are a technique used for researchers to ask and answer their own questions and reflect on their assumptions about the topic. They are also an effective way for researchers to explore personal experiences and the theories and research that have shaped their views on their topic (c.f. Olmos-Vega et al., 2022). The transcripts from these self-interviews (affectionately referred to as “*The Big Monkey*”) are analysed by the co-authors on an ongoing basis. While we appreciate the

perceived fragilities of such data, we also appreciate that (like in the applied field of psychology) “*enquiry into story as data*” through personal reflection “*offers another means by which to close the purported gap between practice and research*” (McIlveen, 2008, p. 2). Therefore, we argue that these curated experiences of the D&A Manager are a proxy for other traditional organisation practitioners currently “in the BA trenches”. This approach affords us the opportunity to ‘*capture the meaning*’ from this practitioner ‘*living the experience*’ (leading a BA initiative in a traditional organisation) and ‘*theorize about that experience*’ for the benefit of others (Gioia et al., 2013, p. 17).

In addition, to ‘*reflective writing*’ the study incorporates ‘*collaborative reflection*’ (c.f. Olmos-Vega et al., 2022). This is primarily based on an on-going analysis of the auto-ethnographic accounts of the lead author. These auto-ethnographic accounts are continuously shared with the co-authors for the purposes of coding and in-depth analysis, where an inductive open coding approach is followed (c.f. Strauss & Corbin, 1990). The two co-authors have a long-term academic relationship with the lead author but are not linked to HEINEKEN and thereby offer an independent, outside-in perspective on the story. This ongoing analysis by the research team enables the constant comparison of interpretations of the lead author’s experiences throughout their time as the D&A Manager at HEINEKEN Ireland. Throughout this ongoing analysis, the lead author is questioned about their story, along with the assumptions and decisions made in HEINEKEN Ireland (or in the telling of the HEINEKEN Ireland story). This approach helps the lead author to uncover their “*blind spots*” and “*to see what you cannot see*” (Olmos-Vega et al., 2022, p. 5).

The empirical context of this study is based on HEINEKEN Ireland, one of Ireland's leading beer and cider companies, with a proud heritage dating back to 1856 when Murphy’s Brewery was established in Cork, Ireland. The organisation, which now employs approx. 400 people, joined HEINEKEN, the world’s second largest brewer in 1983. HEINEKEN Ireland produces a portfolio of household name brands including Ireland’s No. 1 lager Heineken®, Heineken®0.0%, Orchard Thieves, Birra Moretti, Coors Light, and a range of stout, craft and variety beers,

with the portfolio generating annual sales of over €1bn at retail level. HEINEKEN Ireland has matured from little to no BA capability in 2011 to, by the end of 2020, winning the industry peer-voted “Implementation of AI Award” at the Analytics & AI Awards run by the Analytics Institute of Ireland, which is the national analytics professional body.

Finally, in an effort to structure this story (output of our collaborative reflection), we use the DELTA model proposed by Davenport and Harris (2017) to show the movement in stages (from *Analytically Impaired* to *Analytical Competitor*) across the seven capability elements (*Data, Enterprise, Leadership, Targets, Analysts, Technology, Analytical Techniques*). The output of our analysis (see Table 10) itemises the seven capability elements across the HEINEKEN Ireland journey of maturing a BA capability, which is presented across four eras (*Awakening, Building & Exploring, Advancing, Leveraging*).

Findings & Discussion

The evolution of HEINEKEN Ireland BA capability

HEINEKEN Ireland BA capabilities evolved over four distinct eras which we have labelled as Awakening, Building & Exploring, Advancing, and Leveraging.

The Awakening Era, from 2011 to 2012, could be described as the pre-BA era. The organisation and senior leadership had been under the impression that HEINEKEN Ireland already had BA because a Data & Analytics team had been formed at the start of 2011, and therefore the assumption was that everything was in place for the organisation to be data-driven. As the Awakening era progressed, the organisation learned that this was not the case, and a strategy was required to develop a real BA capability.

The start of the Building & Exploring era was marked by HEINEKEN Ireland making the first conscious steps to becoming a data-driven organisation with the launch of its strategic ‘*Analytics Vision*’ in 2013, to advance BA maturity by delivering ‘*better descriptive analytics*’ (more effective and more efficient) and ‘*more advanced analytics*’ (building on existing small-scale experiments to learn

more through further experimentation and deliver value by operationalising and embedding advanced analytics). This era spans four years and saw significant changes across people, organisational structure, technology, and processes but is characterised by exploring, learning, and proving the business value of BA.

By 2016, HEINEKEN Ireland had made significant progress developing a capability to produce BA, however it became clear that progress had stalled and the BA impact on the organisation was not yet transformative. It was apparent to the D&A Manager that a '*gap*' had opened, between the organisation's capability to produce and capability to consume BA. The Advancing era from 2017, resulted from a revised Analytics strategy which focused on closing the '*gap*' and prioritising the delivery of value from BA. This resulted in rapid development of an organisational BA capability, significantly increased engagement from business stakeholders and an accelerated change in the culture from intuition-based decision making to data-informed decision making.

The fourth era of Leveraging is when data-driven decision making became the norm, with the organisation leveraging its BA capability to drive improved business performance. During this era HEINEKEN Ireland, as a recognised BA leader within the HEINEKEN group began sharing best practices and analytics solutions with the other companies in the group.

	Era 1: Awakening	Era 2: Building & Exploring	Era 3: Advancing	Era 4: Leveraging
	2011 - 2012	2013 - 2016	2017 - 2018	2019 - 2020
Data	<i>Localised Analytics</i> Efficient and robust collection of transactional data with transactional systems well integrated.	<i>Analytical Aspirations</i> Good data management across most domains and integration of some non-transactional data sources.	<i>Analytical Company</i> Data management implemented across all data domains used for analytics use cases	<i>Analytical Company</i> External data (e.g., Demographic) and unstructured (e.g., photos) routinely utilised for analytics use cases
Enterprise	<i>Localised Analytics</i> Each function conducting its own analysis with its own domain specific data.	<i>Localised Analytics</i> D&A team emerging with set processes and implementing infrastructure.	<i>Analytical Company</i> D&A team takes on responsibility for all BA	<i>Analytical Company</i> D&A team takes on responsibility for all BA but remains under resourced. IT remains separate.
Leadership	<i>Analytically Impaired</i> Little knowledge of or interest in BA. No burning platform.	<i>Localised Analytics</i> Middle management enthusiastic sponsors of BA and promoters. Executive leadership less so.	<i>Analytical Aspirations</i> Senior leaders embrace BA and role model data-driven decision making	<i>Analytical Company</i> Senior leaders embrace BA and role model data-driven decision making
Targets	<i>Analytically Impaired</i> Each function using localised BA for tactical decision making.	<i>Localised Analytics</i> BA efforts more focused but not aligned with business strategic objectives	<i>Analytical Company</i> All BA activity prioritised and aligned with business strategy	<i>Analytical Competitor</i> BA a central element of HEINEKEN Ireland business strategy
Analysts	<i>Analytically Impaired</i> No specific BA skills. Technology skills in IT,	<i>Analytical Aspirations</i>	<i>Analytical Company</i> External recruitment for BA skills, Development of	<i>Analytical Company</i> External recruitment for BA skills, Development of

	Era 1: Awakening	Era 2: Building & Exploring	Era 3: Advancing	Era 4: Leveraging
	2011 - 2012	2013 - 2016	2017 - 2018	2019 - 2020
	functions conducting analysis with basic excel.	BA role defined and recognised. Talent upskilling to achieve skills. External recruitment for BA skills.	internal talents, partnership with 3 rd Level institutions. External consultants providing specialised skills.	internal talents, Enhanced partnerships with 3rd Level institutions BA competency developed across organisation, beyond D&A team.
Technology	<i>Analytically Impaired</i> Robust ERP with connected CRM and operational systems. Centralised Datawarehouse. BA primarily Excel.	<i>Analytical Aspirations</i> Microsoft BI Stack, In-memory processing for BA models, Basic Predictive Analytics.	<i>Analytical Company</i> Cloud BA platforms. Open-Source Predictive Analytics.	<i>Analytical Company</i> Cloud BA platforms. Open-Source Predictive Analytics.
Analytical Techniques	<i>Analytically Impaired</i> Ad hoc basic Excel analysis.	<i>Analytical Aspirations</i> Statistical analysis, Basic predictive analytics.	<i>Analytical Company</i> Advanced Predictive Analytics routinely used for decision making.	<i>Analytical Company</i> Advanced Predictive Analytics routinely used for decision making.

Table 10. DELTA Capability Levels across four Eras of HEINEKEN Ireland BA Capability Journey

Era 1: Awakening, 2011-2012

The Awakening era started in 2011 with the establishment of the D&A team. However, this was a D&A team in name only. It was comprised of three roles – a Data Management Administrator, Reporting Analyst, and the Data & Analytics Manager. These roles had previously been dispersed across different functions and were now grouped together and labelled “Analytics”. The D&A team was organised in the commercial function and was responsible for maintaining master-data, business performance reporting, and key analysis activities such as sales forecasting. The data warehouse served as the demarcation line between the new D&A team and IT, which remained separate and was responsible for providing transactional data from the ERP, CRM, and other operational systems to the data warehouse, at which point responsibility for extraction and usage passed to the D&A team.

The BA focus was on Business Intelligence (BI) and the need to provide information to people across the business. All the data used for analysis was internal structured transactional data. There was no big data, no unstructured data, and no use of predictive analytics. The descriptive analytics were all excel based and very basic, with no visualisations and were distributed to business users either by email or saved to a share drive. Forecasting was exclusively conducted in excel with basic techniques and then refined by the analysts based on their experience and commercial expertise. Ultimately, while data was used to inform people, decisions were made based on the intuition of individual decision makers across the business.

While the small, centralised D&A team conducted the reporting and analysis for strategically important domains such as sales forecasting, much of the operational reporting and analysis was dispersed and conducted within each function such as marketing, customer service or technical operations. Analysis of data in these functions was normally a secondary function of someone’s job and was not their core competency. This resulted in a generally low standard of BI which was an impediment to data-driven decision making.

Despite the economic recession at that time, HEINEKEN Ireland was performing well. The organisation's leadership was making the right decisions to ensure that HEINEKEN Ireland grew market share and profitability each year. Therefore, there was no burning platform to provide an incentive for a data-driven transformation and there was a low awareness at all levels of the organisation (even amongst the three members of the D&A team) of what it means to be data-driven and what BA entails. However, while the reporting and analysis had improved somewhat, a frustration developed within the newly formed BA team that there had been no fundamental advancement in BA capability over the previous ten years and there was a curiosity to discover what the latest best practice looked like. Practitioner business publications at the time began to more prominently feature Data & Analytics articles which confirmed that HEINEKEN Ireland BA capability did not match the best analytical competitor organisations.

The first attempt at a more sophisticated BA use case was conducted in 2012. Up to that point, sales were forecasted by brand at a national level. Linear regression was applied to weekly sales performance which was then adjusted by the analysts to allow for any promotions or new product launches etc. The experiment was an attempt to forecast volumes for the year 2012 by using sales for each brand, not at a national level but at an individual customer level.

The experiment revealed that HEINEKEN Ireland did not have the technology or the data modelling skills to analyse volumes of data which exceeded the limitations of excel. A relatively simple model was built which used linear regression on seasonally adjusted sales data to predict weekly sales by brand for each of HEINEKEN Ireland's individual customer outlets. As well as highlighting the shortcomings in capability, that initial predictive model was a very successful proof of concept which demonstrated the value of uncovering previously hidden patterns in the data. The model produced insights which explained why a business cost of over €10m per year had been consistently over budget and informed the business to take corrective action, with the result that a budget shortfall was avoided in subsequent years. This use case was to prove invaluable as HEINEKEN Ireland moved into Era 2 as a demonstration to senior stakeholders of how BA could improve decision making in the organisation.

Era Summary

At the end of 2012, the reports and dashboards had improved, but improvement had basically meant doing the same things in an incrementally better way. The organisation was still not data-driven, but HEINEKEN Ireland had learned that BA had the potential to be truly transformative, not just for the D&A team but for the entire organisation. However, it was now clear to the D&A Manager that continuing an evolutionary path would not deliver the BA capability required for a data-driven transformation. A holistic analytics transformation strategy was required.



Picture 4: HEINEKEN Ireland Brewery, Cork

Era2: Building & Exploring, 2013-2016

In January 2013, work commenced on preparing a BA Strategy for HEINEKEN Ireland. The business was now aware that it was not data-driven and rather than being an *Analytical Competitor*, it more resembled an *Analytically Impaired* organisation. However, it was still not clear what was required to build a BA capability and how it

could improve business performance. Senior leaders were interested in exploring the possibilities but there was still no commitment or aspiration to implement a data-driven transformation (traditional business + no burning platform + little knowledge of BA = limited interest or commitment to Business Analytics).

The inputs for the strategy were a combination of practitioner and academic BA literature along with engaging senior commercial and IT leaders from three other leading CPG organisations in Ireland and Europe which at that time were considered leaders in terms of BA capability. The academic and industry literature had painted a picture of sophisticated BA landscapes with many organisations embracing BA as illustrated for example by Davenport (2006) in the Competing on Analytics paper. In contrast however, the reality in the other CPG organisations which were met, which were also traditional, long-established businesses, was that they were at a similar stage of maturity to HEINEKEN Ireland. However, the other organisations had all recognised the potential of BA and were already working on their own BA strategies and had started investing to build their capabilities.

The BA strategy was known internally as the “Analytics Vision” and could be summarised by *Better Descriptive Analytics* enabling *More Predictive Analytics*. Descriptive analytics at that time was still almost exclusively Excel based. All the standard and ad-hoc reports were manually prepared in excel and emailed around the business. Better Descriptive Analytics represented better effectiveness and better efficiency. The idea was that utilising the latest BI technology and automation would free up D&A team resource to be redeployed to deliver More Predictive Analytics (beyond the isolated ad-hoc experiments conducted in 2012) and that introducing visualisation and self-service would improve effectiveness and utilisation of BA to enable data-driven decision making. To realise the vision of Better Descriptive Analytics and More Predictive Analytics, five action areas were identified as outlined in Table 11.

In addition to the technology changes and new BA skillsets brought into the D&A team, one of the most impactful advancements was the introduction of Agile. The new Agile mindset and way of working resulted in solutions being developed in conjunction with and in partnership with the business stakeholders, with a focus on iteratively delivering

value quickly. This change from Waterfall was a big shift and took the full four years of Era 2 to implement. The D&A team members, particularly the more experienced members had been more comfortable with the traditional waterfall approach and preferred to be given clear requirements, time to develop to those requirements, and then present back their solution. However, by the end of era 2 the D&A team had fully embraced Agile with team members observing benefits including greater ownership of BA solutions by business stakeholders, faster value delivery with the early deployment of Minimum Viable Products and greater ideation and development of skill sets as by working in groups, everyone (within the D&A team and cross-functionally) was learning from each other.

However, by the end of 2016, progress had stalled. Due to the exponential increase in demand for new descriptive solutions, the resource constrained D&A team was unable to focus on predictive analytics as envisaged. Furthermore, while some of the new predictive solutions were well received and utilised, most were not being operationalised by the business. An analytics gap had opened between the D&A teams ability to produce ever more sophisticated analytics and the organisation's ability to consume them, as articulated by the Sales Manager in a feedback survey *"The D&A team has gotten very advanced and is moving very fast – but you need to look behind you and make sure to bring the rest of us with you before moving on to the next new thing"*. Senior leadership was also starting to get frustrated as they had expected predictive analytics to have been delivering significant value at the front line.

Pillar	Description	Actions
Data Management	Build solid foundation of data upon which to apply BA	• New Data Management programmes for critical areas of the business • Centralising Data Management activities from various business functions • Re-engineering data processes • Ingestion of data from external sources
Technology	Deploy the IT tools to effectively process the data	• HEINEKEN Ireland moved away from excel and MS PowerPivot became tool of choice to create data models for reporting and analysis. Full automation of Descriptive Analytics required an upgrade to the SQL Server DW, which was delivered in conjunction with IT, along with implementation of the MS BI Stack and rebuilding of all BI solutions.
Organisation	Align D&A team Structure and Ways of Working to future business needs	• The D&A team which was by now four people was restructured with new specialised BA roles and Agile was introduced as the operating method.
People	Develop analytical capability & skills	• The new roles required skills which the current incumbents did not have. Funding for training was made available which allowed some team members to upskill, while others were redeployed elsewhere in the organisation and the required skillsets recruited externally.
Culture	Embed Data-Driven decision making throughout the organisation	• Acknowledgement delivering best in class BA solutions would not be enough to change the culture and way of doing things as most people in the organisation were in their roles for many years and were set in their ways. • Senior sponsorship for BA with executive leaders seen to be advocating for data-driven decision making. • Alignment of all BA activities with the business strategy. • Business processes, WoWs and rewards structured around BA outputs. • Engaging, intuitive, interactive, and visual reporting solutions and analytic tools to promote utilisation.

Table 11. HEINEKEN Ireland Analytics Vision 2013 - Action Areas

Era Summary

The Analytics Vision was successful in advancing the BA maturity of HEINEKEN Ireland. By 2016, all routine Descriptive Analytics were automated with new standards of visualisation, and interactivity which far exceeded the business expectations, and the team was now starting to produce insights leveraging the newly acquired predictive analytics capabilities. The value being delivered by BA was also beginning to be recognised. The organisation launched a new business strategy in 2015 and for the first time ever, BA was included as a key enabling pillar. Further recognition of the growing importance of BA was the fact that the D&A team which had previously been part of the business support function was restructured as a standalone D&A function. However, while the capability of the team had grown, an analytics gap had emerged between the producers and consumers of analytics within the organisation.

Era3: Advancing, 2017-2018

In the Advancing era, the focus turned to building the capability to realise value from BA, close the gap which had opened between the organisations capability to produce and consume BA, and building the data-driven culture across the organisation. During era 2 the foundations had been put in place, descriptive analytics had been transformed and while the D&A team was producing some useful predictive analytics, the impact was not yet transformative.

In the same way that the second era had started with the development of a strategy, the third era also started with a strategy to advance BA capability. The D&A team had built up a body of knowledge and practical experience, so the revised strategy was informed to a large degree by a retrospective conducted by the D&A team and then enriched from the BA literature. The retrospective identified many positive changes which had been implemented during era 2 such as the move to Agile, the new BA technology stack and improved Data Management.

The main challenges identified by the retrospective centred around three capability elements of the DELTA framework - Targets, Enterprise, and Analysts.

There was some misalignment between the activities which the D&A team were investing in and the business priorities of the organisation, some other functions outside the D&A team were conducting their own reporting and analysis, and the D&A team was still only four people and not sufficiently resourced to meet demand.

The D&A team made significant changes by, jointly with the business leaders, ruthlessly prioritizing use cases which were closely aligned with the strategic objectives of the business. During the second era of Building & Exploration, BA use cases were developed which enhanced the capability of the D&A team to produce ever more advanced BA solutions and which were expected by the D&A team to be useful to the business. The shift in era 3 was that the business need took precedence over exploring BA capability and use cases which were interesting from a D&A perspective but not aligned with the top business priorities at the time, were deprioritised, or cancelled. This included some high-profile initiatives such as a partnership with Microsoft to develop an innovative computer vision solution. This was a difficult decision for the D&A team who got great satisfaction from working on cutting edge analytics projects and developing their own technical analytics skills.

The D&A team was restructured to take on more of an enterprise role, with BA activities which had been in other functions consolidated within the D&A team. There was still no incremental increase in resources but the transfer of roles from the other functions resulted in the D&A team doubling from four to eight people. This realised efficiencies as most of the reporting and analysis that was being conducted in the other functions was manually intensive and basic, so was relatively easy to automate. This also improved the standard and consistency of BA across the organisation. The D&A team also took on more end-to-end responsibility across the information supply chain, for example developing its own mobile apps to allow field reps collect data, including images, and built its own cloud-based databases to store the structured and unstructured data. While IT were at all times consulted, it was necessary for the

D&A team to proceed independently because IT did not at the time have the required cloud or app development capability and did not see its own remit beyond the internal systems and data.

Era Summary

All the capability elements of the DELTA Model need to be working together and if some advance too far ahead or fall behind the others then it is not possible to move forward developing a BA capability (Davenport and Harris, 2017). The third era of HEINEKEN Ireland's BA capability journey started off by addressing this imbalance in the DELTA elements and closing the analytics gap that had opened in era 2, as a result of developing the capability to produce BA faster than the organisation's capability to consume. Expanding the scope of the D&A team also brought more of an enterprise approach and a more holistic coordination of BA activities across the Information Supply Chain.

Era4: Leveraging, 2019 - 2020

By the fourth era on HEINEKEN Ireland's BA capability journey, it was no longer necessary for the D&A team to sell or promote the use of BA for decision making, as data-driven decision making had become the preferred way of doing things. The data and technology foundations, people and processes were in place and a data-driven organisational culture had started to replace the old intuition-based culture. By 2019 this was recognised at the senior levels of the organisation and to quote the Sales Manager, *"The analytics machine is humming"*, while according to the Commercial Director, *"Analytics is now having a real impact on the business performance"*.

The Irish D&A team was also recognised within HEINEKEN International and was held up as a role model for how to develop a BA capability and the practices developed were regularly being shared globally. Out of 70 countries with HEINEKEN operations, Ireland was selected as the launch country for a new BA programme which was focused on scaling predictive and prescriptive analytics solutions. HEINEKEN Ireland also received external recognition winning the

Implementation of AI Award which was shortlisted by the judging panel of the Analytics Institute of Ireland and then voted on by industry peers.

During this era, capabilities continued to be developed such as the skills of the team, more sophisticated BA solutions, greater use of cloud technology and greater diversity of BA Use Cases across more business domains. Joint prioritisation of use cases with the senior business leadership ensured that D&A resources were allocated to the most strategic and impactful opportunities. Nevertheless, due to the developing data-driven culture across the organisation, the demand for BA solutions was growing exponentially and during 2019, the D&A team was responding to less than 50% of the business requests for BA. This started to lead to frustration as business stakeholders found they could not get support for their operational BA requirements. This was resolved by the D&A team establishing an Analytics-As-A-Service offering. Business stakeholders or use case owners, whose BA use cases were not prioritised by the senior leadership were offered the option of paying for the BA solution from their own budgets. The D&A team formed a partnership with an external analytics contractor to supplement its own resources as required. As well as providing a solution to meet demand, this also encouraged stakeholders across the business to think of BA in terms of the value it delivered, which further contributed to developing the data culture in the organisation.

In 2020 the COVID-19 pandemic impacted economies around the world and the market which HEINEKEN Ireland operates in was significantly affected. This proved to be a catalyst which accelerated even further the data-driven transformation in the organisation. While data-driven decision making was already well established, any remaining business decision makers who had been still relying on their intuition for decision making suddenly found that they could no longer rely on their experiences in such a distorted market. If in the past there had not been a burning platform as a reason for becoming data-driven, now suddenly the platform was burnt. In the absence of any other option, even these die-hard gut-feel traditionalists converted to seeking data answers to their many

business challenges. As a result of the reliance on BA to support the business operation, the D&A team was granted an exemption when all other HEINEKEN Ireland staff took a 20% reduction in working hours during 2020. The leveraging of BA in new ways for better decision making during the Covid pandemic was extensive and ranged from identifying which customers presented the greatest credit risk, to planning new logistics operations and demand planning. With the market closed for an extended period, traditional data sources such as historical sales were no longer available so new data sources and methods needed to be developed. This required the D&A team to be creative and develop innovative approaches in the absence of traditionally relied upon data sources. For example, sales forecasts were informed by a diverse range of new data such as qualitative data from customer interviews to understand customer intentions, market performance in other countries which had reopened faster than Ireland to quantify actual consumer behaviour, and daily footfall data from streets in large Irish cities to understand consumer movements during various stages of lockdown. Prior to developing its BA capability, HEINEKEN Ireland would not have been able to collect such diverse data and would not have been able to build the predictive models which delivered sales forecasts which turned out to be exceptionally accurate.

It can be easy to make business decisions based on data when the data supports what the gut-based decision would have been anyway. However, the revenue projections being produced during 2020 by the HEINEKEN Ireland D&A team based on these innovative BA solutions were significantly different to the gut-based estimates of the experienced managers and the projections from other HEINEKEN operating companies across Europe. Due to the rapidly changing business environment, HEINEKEN Ireland was required to submit revised projections to HEINEKEN International each month of 2020. It would have been much easier for the HEINEKEN Ireland senior leaders to submit projections in line with their peers, but instead they went with the BA projections. This was initially difficult for them as for the first couple of months their superiors at HEINEKEN International challenged them hard on why they

thought HEINEKEN Ireland was different to other operating companies in Europe. As 2020 progressed, it became apparent that having the courage to rely on BA delivers much better business decisions, especially in situations such as a global pandemic which is so emotive and novel for humans to comprehend. By the end of 2020, the HEINEKEN Ireland projections were still different to the narrative from the rest of Europe, but rather than being challenged, HEINEKEN Ireland was lauded for its understanding of the local market and ability to accurately predict in such an uncertain environment.

Era Summary

The demonstrated successes of BA during the Leveraging era created an ever-growing appetite for BA to support data-driven decision making. In order to meet this demand in a sustainable way and ensure that HEINEKEN Ireland continued to accelerate on its journey to becoming an Analytical Competitor, the D&A team was restructured at the start of 2021. The D&A team had by necessity assumed the role of IT for BA app development and cloud data platforms, while IT remained responsible for infrastructure and the legacy systems such as ERP and CRM. The D&A team was merged with IT to form a new Digital & Technology function. Furthermore, to continue accelerating the democratisation of BA and bring data-driven decision-making capability closer to the front-line decision makers, responsibility for Analytics Translation moved to each of the individual business functions with the new central D&T function playing a supporting role as a centre of excellence. While the period post 2020 is beyond the scope of this paper, the HEINEKEN Ireland BA capability journey continues.

Key Findings

In the previous sections we have described the progression of HEINEKEN Ireland's BA capability through the four eras of Awakening, Building & Exploring, Advancing, and Leveraging. We have outlined in Table 10 the progression through the lens of Davenport & Harris (2017) DELTA BA Maturity Framework and categorised the maturity level for each of the capabilities at the end of each era. However, it is worth noting that the journey of developing BA capabilities is not just one-way improvements and maturity can also decline. For example, the

Targets capability element would have been assessed at a level of Analytical Company in 2015 because the initial advanced analytics use cases were aligned with business strategy and were influencing strategic decision making. However, by the end of 2016 with subsequent advanced use cases failing to achieve the same level of utilisation the level of Localised Analytics is more reflective of the maturity level as at the end of era 2.

We now summarise the development of capability across the DELTA capability elements, but we prioritise Targets, Leadership and Analysts as these were determined by the D&A Manager to be the most significant in the HEINEKEN Ireland journey before then summarising the remaining capability elements.

Need for Strategic Target Alignment

BA efforts need to be aligned with the strategic objectives of the organisation and focused on impactful use cases and applications (Davenport, 2018), but BA efforts in HEINEKEN Ireland during era 1 were predominately operational and localised. The implementation of the first BA Vision during era 2 did result in the utilisation of BA for some strategic decision making, however the focus had been on developing the BA production capabilities such as Technology, Analysts and Data rather than consciously prioritising and aligning with business strategy. The assumption had been that delivering any increased level of BA would improve decision making and therefore be successful. By the end of era 2, HEINEKEN Ireland had learned that the “Build it and they will come” approach had not worked. The D&A team had built it, but they (business stakeholders) did not come. The conscious decision to focus and prioritise BA investments and activity on clearly aligned business strategic objectives resulted in much greater impact through increased value delivery, greater engagement from across the business community and significantly a much greater level of support for BA from the senior leaders of the organisation.

Senior Leadership Buy-in

Analytical organisations tend to have leaders who embrace BA and drive the development of a data-driven decision making culture in the organisation

(Davenport, 2018). Despite being supportive of data-driven decision making in principle, a lack of awareness or interest in further developing BA capability at the senior leadership level meant that the data-driven transformation was not initially driven from the top. This slowed progress as the impact of BA needed to be proven before significant changes gathered executive level support. It could be argued that this was one of the reasons why era 2 of Building & Exploring spanned four years. Many middle managers, who were able to more closely observe the benefits and impact that enhanced BA was having on business performance became enthusiastic supporters and advocates of BA before the senior leadership of the organisation, who did not become enthusiastic advocates until era 3. However, once the senior leadership was seen to embrace and proactively support BA, this was observed to promote an acceleration in the development of the data-driven culture across the organisation.

Analyst Development and Sourcing

BA talent includes a range of skills required to produce BA solutions and also consume and implement the outputs (Davenport & Harris, 2017). The D&A team in HEINEKEN Ireland started off in era 1 without any specialised BA skills, so a priority in era 2 was implementing the structures and obtaining the skillsets for descriptive and advanced analytics. As the sophistication of technology and analytical techniques increased, the skillset of existing analysts also needed to be constantly updated, while HEINEKEN Ireland needed to adopt a flexible approach to obtaining additional analyst external talent. The Analysts element of DELTA also includes the business consumers of BA, so a key component of developing the HEINEKEN Ireland BA maturity was improving the capabilities of people across the organisation to understand and utilise BA.

Data as an Enabler Not a Restriction

BA is simply not possible without access to relevant data of the appropriate quality. HEINEKEN Ireland matured from a total reliance on transactional structured data to routinely utilising harmonised internal and external, structured and unstructured data to deliver BA solutions based on business requirements rather than data availability (or lack of).

Building an Enterprise Data Vision

In order to increase analytical competitiveness, organisations need to adopt an enterprise approach to BA (Davenport & Harris, 2017). The journey to achieving this in HEINEKEN Ireland started with the Analytics Vision in 2013 which was the first BA strategy integrating data, technology, people and organisational elements of BA capability. As the organisation progressed through the eras, the level of enterprise coordination increased culminating in 2020 with the organisational restructure combining IT and D&A in a new function.

BA Capability over BA Technology

Technology is a fundamental enabler for BA and the absence of effective technology during era 1 was a clearly visible blocker. Rather than starting off by taking on a significant BA technology investment, the technology landscape in HEINEKEN Ireland evolved throughout the eras in response to the developing BA capability of the organisation.

Embracing Advanced Analytical Techniques

Organisations generally rely on more advanced analytical techniques as they become more sophisticated in the application of BA (Davenport & Harris, 2017). HEINEKEN Ireland put in place the required tools and skills to enable the utilisation of a wide range of appropriate analytical techniques from interactive visualisations for descriptive analytics to machine-learning models for advanced analytics.

Summary of Key Findings

It could be argued that had the learnings which HEINEKEN Ireland uncovered during its journey been known at the outset, then the maturing of BA capability might have occurred at a much faster rate. Each organisation is different and faces its own challenges to overcome on its journey to becoming an “Analytical Competitor”. However, as a result of this research we present several key watchouts to be considered by other similar organisations as they embark on their own journeys to become “Analytical Competitors”

- **DATA:** Don't get distracted by new sources of external data. Ensure that your internal structured data is robust, fit for purpose and is being used for BA.
- **ENTERPRISE:** Don't expect the enterprise landscape to remain static. Develop a strategy for change as the BA capabilities and objectives mature.
- **LEADERSHIP:** Don't leave senior leadership behind. BA will ultimately only succeed by being driven from the top.
- **TARGETS:** Don't adopt a "build it and they will come" approach. Focus on ensuring that all BA activities are aligned with business strategic objectives and prioritised on the greatest business value impact.
- **ANALYSTS:** Don't limit skills building to those with data and/or analytics in their title, as BA is a team sport played by the entire organisation.
- **TECHNOLOGY:** Don't overinvest in sophisticated technology at the outset, pursue an evolving 'use case' driven investment over time.
- **ANALYTICAL TECHNIQUES:** Don't limit the portfolio of analytics tools and skills to one type of analytics, ensure adequate diversity for various types of analytics and constantly keep up to date with latest developments.

Finally, and possibly most importantly, is to act! Recognise that all elements of the DELTA model will never be perfect and the time for organisations to move is now. No matter which stage of BA maturity an organisation is at, they need to develop and implement a holistic strategy to advance, while embracing constant change and adopting a willingness to learn from failures along the way.

Conclusion

This paper presents unique research in that it leverages the richness of the lived experiences from within a large traditional organisation over a ten-year period as it develops a BA capability. Using reflective writing and collaborative reflection, HEINEKEN Ireland's BA evolution is analysed through the lens of the DELTA model. The result provides several unique insights into the organisations analytical journey, which are articulated through key learnings that can be adopted by any organisation developing their analytical capability. In addition, the richness of the lived experiences provides a specific context to each of the DELTA components, which again provide additional guidance for data-driven practitioners.

References

References are consolidated in References section.



Picture 5: Showcasing the BA journey of HEINEKEN Ireland at Analytics Institute of Ireland Inspire Event held in HEINEKEN Cork offices, October 2019

Chapter 3 BAKE THE CAKE: HOW A TRADITIONAL ORGANISATION DELIVERS IMPACTFUL ANALYTICS

Paper Summary

Paper Summary Chapter 3 – Capability Building How a Traditional Organisation Delivers Business Impactful Analytics			
Peer Review	Analysis Method	Key Data	Key Contribution
Information Systems Management Paper under review	Generation and evaluation of Critical Success Factors from the “lived experiences” accounts of BA practitioner.	BA Leader first person autobiographical phenomenological accounts. Survey data from key business stakeholders.	Conceptualization of the CSFs to deliver impactful BA in a traditional organisation.

Introduction

The interest in Business Analytics (BA) continues to grow amongst researchers and practitioners as organisations recognize the opportunities to create value by leveraging data for better decision making (Delen & Ram, 2018; Hindle et al., 2020; Mikalef et al., 2020; Namvar et al., 2021). However, organisations are struggling in their efforts to become data-driven and build their BA capability (Davenport & Redman, 2020; Klee et al., 2021) with less than 25% of organisations in the recent New Vantage Partners (2023) Data and AI Executive Survey considering themselves to be data-driven. Challenges faced by aspiring data-driven organisations include issues with organisational structures, culture, people capability, and technology (Chuah & Wong, 2011; Redman, 2021; Smith et al., 2019) while ‘traditional organisations’, which were established before the digital era, face additional challenges, as they can be impeded by the traditional structures and processes which had worked for them in the past (Gust et al., 2017).

While there is a consensus in the literature that organisations need to address not just the technical elements of BA capability, most of the existing literature focuses on technical elements, with much less research to date on how organisations develop their BA capabilities and the transformation needed to deliver value through becoming data-driven (Chen & Nath, 2018; Hindle et al., 2020; Mikalef et al., 2020). Organisational capability is an intangible concept but has been defined by Ulrich and (2004, p. 119) as *“the collective skills, abilities, and expertise of an organisation, which represent the ways that people and resources are brought together to accomplish work”*. When it comes to BA therefore, organisational capability includes elements such as a data-driven culture, data management processes, technology, people skills and talent (Kiron et al., 2014). However, more needs to be done to aid traditional organisations embark on a successful journey to build capabilities to deliver impactful BA. As a result, we pose the following **Research Question:** *What are the critical success factors (CSFs) to deliver impactful BA within a traditional organisation?* To answer this research question, we follow a theory-building research strategy (embracing auto-ethnographic accounts) to develop an understanding of the CSFs. The ongoing documenting and analysis of the first author’s personal experiences (over a ten-year period – from 2011 to 2020), as the Data & Analytics (D&A) Manager within the case company (HEINEKEN Ireland), provides the dataset for this research (story as data). These curated experiences are viewed as a proxy for other traditional organisation practitioners currently “in the BA trenches”. This approach affords us the opportunity to ‘*capture the meaning*’ from those practitioners ‘*living the experience*’ (leading a BA initiative in a traditional organisation) and ‘*theorize about that experience*’ (Gioia et al., 2013, p. 17). We then close the loop and validate the identified CSFs through surveying a cross section of key stakeholders from the case company.

The remainder of this paper is structured as follows. In the next section we present the rationale behind proposing the CSFs for impactful BA in ‘traditional’ organisations. Thereafter, we focus on the research approach being followed. This is followed by a presentation of our observations gained through coding the

first author's personal experiences as the Data & Analytics Manager within a traditional organisation. These observations are organised around the *Business Analytics Recipe* (BAR) conceptual model. We then present the evaluation of the CSFs by key stakeholders from the organisation. The paper concludes with a reflection on the contributions, implications, and opportunities for further research.

Theoretical Underpinnings: Why CSFs for Impactful BA?

There are many terms used in literature to refer to the use of data for decision making. Davenport and Harris (2017, p. 25) put forward their definition of BA as *“the extensive use of data, statistical and quantitative analysis, explanatory and predictive models, and fact-based management to drive decisions and actions”* while Baesens et al. (2016, p. 808) define BA as *“all aspects of the data process to facilitate predictive and/or causal inference-based business decision making”*.

Organisations which have successfully developed a BA capability are seen to outperform their peers (Davenport & Harris, 2017) and the BA literature suggests that there are a number of elements, ranging from foundational elements of data and technology, to people skills, structures & ways of working, to the capability to implement and action BA, along with an organisational data-driven culture which all need to be in place to ensure success. It is also clear that many organisations have not yet successfully developed a BA capability and are continuing to fail in their efforts despite the investment of significant resources (Davenport & Redman, 2020; Smith et al., 2019). To help address this practical problem and go towards closing the gap in the body of knowledge there is a requirement for further research on how organisations bring these elements together to develop their BA capabilities and deliver business value (Chen & Nath, 2018; Mikalef et al., 2020). In fact, research shows that “failure rates” for the introduction of IS initiatives (like BA) remain high (Cecez-Kecmanovic et al., 2014; O'Neill, 2019). The rate of failure suggests the need to focus the attention

of IS professionals and academics on addressing and developing a list of factors that will enable the successful delivery of IS initiatives (Alhassan et al., 2019).

The concept of Critical Success Factors was notably developed and systematised by John F. Rockart in the 1979 article “*Chief Executives Define Their Own Data Needs*”. Building on earlier insights from Daniel (1961), Rockart introduced CSFs as those “*few key areas where things must go right for the business to flourish*” (1979, p. 85). Rockart proposed that success in complex initiatives (such as in this case an organisational data-driven transformation), does not depend equally on all factors, but rather there is a subset of conditions that are vital – not just important – for success. These CSFs are context dependent, shaped by industry dynamics, organisational structure, and leadership vision. Unlike tactical goals or KPIs, CSFs are strategic prerequisites, and their absence likely leads to failure, regardless of effort elsewhere.

However, providing a list of CSFs is only a partial aid to success; more is needed on the implementation actions required around any list of CSFs stated (Alhassan et al., 2019). However, to date, little or no research has documented the CSFs for delivering impactful BA in traditional organisations.

It is argued that Critical Success Factors (CSFs) are an established approach for providing guidance as a “*popular simplification mechanism to assist managers*” (Janssen & Borman, 2013, p. 86). For the purposes of this research we adopt Rockart’s well-established definition of CSFs as “*areas of activity that should receive constant and careful attention from management*” (Rockart, 1979, p. 85). CSFs have been widely investigated and used in Information Systems (IS) research and practice over the last three decades to make sense of problems by identifying the factors that could influence business activities and outcomes (Alhassan et al., 2019; Butler & Fitzgerald, 1999; Jenster, 1986; Shah et al., 2007). Throughout this period, researchers have identified CSFs, that need more attention from managers, in areas ranging from “project-type” operational initiatives to more “mindset shift” strategic initiatives. In essence, their continuing popularity is linked to their most valued characteristic of simplicity,

as a statement of focus and action. Interpretive qualitative research is an appropriate research design to apply when exploring CSFs and several scholars have investigated and explored CSFs in IS by applying qualitative methods (Alhassan et al., 2019; Butler & Fitzgerald, 1999; Sammon & Adam, 2008).

In the next section we present a description of our research approach to building theory. We believe that our approach strengthens the relevance of our research outputs for practitioners, where the practitioner voice and their lexicon is central to the theorizing and the outputs produced. It is worth mentioning that we believe in the development of theory that informs practice. More specifically, we believe that if the co-construction of theory-informing-practice is our ambition in IS, then the stories of a practitioner (as a researcher) must have a '*methodological place*' and be brought forward for '*critical inspection*' (McIlveen, 2008).

Research Approach: Story as Data

For the purposes of this research, we propose a two-stage research design, where we use mixed methods in a sequential manner to address different aspects of the research problem (*what are the critical success factors (CSFs) to deliver impactful BA within a traditional organisation?*). Stage One is an effort at generating the CSFs from the "lived experiences" accounts of the lead author, who was the Data & Analytics (D&A) Manager within the case company (HEINEKEN Ireland) from 2011 to 2020. While differing from Rockart's (1979) methodological approach of identifying CSFs through structured interviews with executives to surface their implicit strategic priorities, our approach remains faithful to his philosophy: that CSFs are contextually situated, grounded in executive experience, and essential for aligning technology efforts with organisational priorities. Stage Two, which took place in 2023, is an effort at corroborating the relevance of these CSFs within the same organisational context (the case company), where evaluations are provided by key stakeholders linked to the BA capability (independent of the lead author) using a short online survey. We undertake Stage Two of this research to corroborate, elaborate, and

enhance the results produced in Stage One. This aligns with the “*triangulation*” and “*complementarity*” justifications proposed by Greene et al. (1989, p. 259). Therefore, we believe our two-stage approach increases (i) the “*trustworthiness*” of our results by specifically counteracting “*inquirer bias*”, and (ii) the “*interpretability*” and “*meaningfulness*” of the results by “*both capitalizing on inherent method strengths and counteracting inherent biases in methods*” (Greene et al., 1989, p. 259).

Stage One of this research embraces the use of “*first person autobiographical phenomenological accounts*” (from here out referred to as *accounts*) where the lead author uses “*their own experiences to examine the quality and essences*” of the implementation of a BA strategy in a traditional organisation (the phenomenon) (Finlay, 2012, p. 1). The aim of such accounts is to provide “*rich, compelling thought-provoking descriptions of lived experiences*” (Finlay, 2012, p. 2). These accounts were initially written by the lead author for themselves as part of helping to make sense of their experiences leading the implementation of a BA strategy. Thereafter, the other two members of the research team had the benefit of reading and analyzing such structured accounts. As highlighted by Finlay (2012, p. 2) “*the subjective reality of the lived experiences can, through the writing, be brought closer – both to the writer and to others through engendered empathy*”.

According to Finlay (2012, p. 2) while there is no one way to craft first person autobiographical phenomenological accounts “*writers generally offer written narratives that include concrete descriptions of events*”, for example through the use of “*creative, self-expressive media such as reflexive writing*”. Somewhat aligning with this, in this research, we use a combination of ‘*reflective writing*’ and ‘*collaborative reflection*’ (Olmos-Vega et al., 2022, p. 5). The ongoing documenting and analysis of the lead author’s personal experiences as a D&A Manager (over the ten-year period from 2011 to 2020) is a very rich source of field data. According to Finlay (2012, p. 7) “*such first-person accounts thereby constitute valuable qualitative evidence; whether this is as ‘data’ or as ‘findings’*”

in themselves”. More specifically, since 2016, the lead author has also conducted a series of ‘self-interviews’ (Olmos-Vega et al., 2022, p. 6), where the transcripts from these self-interviews (affectionately referred to as “*The Big Monkey*”) are analysed by the research team on an ongoing basis. In fact, the ‘collaborative reflection’ is primarily based on this on-going analysis of the lead author accounts. Therefore, the two research team members followed an inductive open coding approach (c.f. Strauss & Corbin, 1990) as part of the in-depth analysis (see Figure 7).

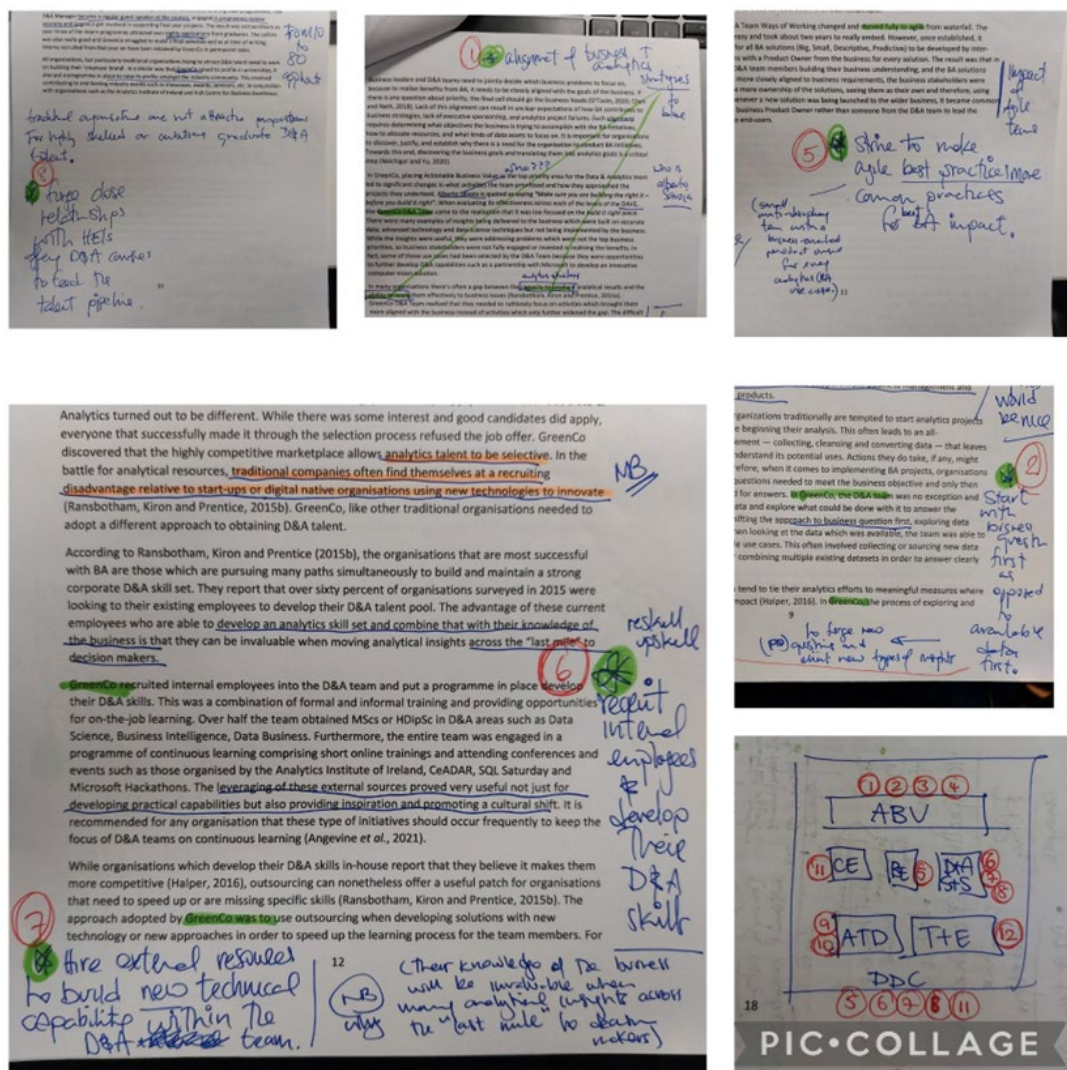


Figure 7: A Snapshot of the Inductive Open Coding of the Lead Author Accounts

Unlike the lead author, the two research team members are not linked to HEINEKEN and thereby offer an independent, outside-in perspective on the story. This ongoing analysis by the research team enables the constant comparison of interpretations of the lead author's experiences throughout their time as the D&A Manager at HEINEKEN Ireland. Throughout this ongoing analysis, the lead author is questioned about their story, along with the assumptions and decisions made in HEINEKEN Ireland (or in the telling of the HEINEKEN Ireland story). This approach helps the lead author to uncover their "blind spots" and "to see what you cannot see" (Olmos-Vega et al., 2022, p. 5). However, these accounts also offered the two research team members "*a way to get 'up close and personal' with specific experiences*", to better understand and empathize with what the lead author (as a D&A Manager) may be going through. Therefore, the accounts also challenged the two research team members "*blind-spots and taken-for-granted assumptions*" (Finlay, 2012, p. 7). While we appreciate the perceived fragilities of such data (first person autobiographical phenomenological accounts), we also appreciate that (like in the applied field of psychology) "*enquiry into story as data*" through personal reflection "*offers another means by which to close the purported gap between practice and research*" (McIlveen, 2008, p. 2). Therefore, we argue that these curated experiences of the D&A Manager are a proxy for other traditional organisation practitioners currently "in the BA trenches". This approach affords us the opportunity to '*capture the meaning*' from this practitioner '*living the experience*' (leading a BA initiative in a traditional organisation) and '*theorize about that experience*' for the benefit of others (Gioia et al., 2013, p. 17). Therefore, the twelve CSFs to deliver impactful BA in a traditional organisation (presented in this paper) emerge from our combination of '*reflective writing*' and '*collaborative reflection*'.

In Stage Two of this research, we evaluate each of the twelve CSFs through engaging with key stakeholders within HEINEKEN Ireland (using a short online survey). Online surveys are an effective and scalable way to receive feedback from practitioners, if designed in a way that requires minimal effort to complete

(c.f. Alyami et al., 2023; Lo et al., 2015; McCarthy et al., 2022). Therefore, we designed a short 12-question survey (1 question per CSF using an ordinal scale of high/medium/low) to gather practitioner perspectives on the ranked importance of each of the CSFs (stated as follows: please rank the importance of this CSF based on your experiences). As a result, the short survey was viewed as another data gathering instrument that would provide numerical descriptions of the importance of each CSF (based on respondents' experiences to date). In our survey, a respondent was required to answer all 12 questions to submit a valid survey response. The survey responses were gathered (using MS Forms) over a 1-month period in August 2023. In total the survey was completed by 12 stakeholders who were each involved in the development of the HEINEKEN Ireland BA capability during the years 2011 to 2020. Of the respondents, 4 can be classified as Business Strategic (Functional Directors), 2 as IT Strategic (senior IT Leaders), and the remaining 6 were members of the D&A team.

The 'Data & Analytics Manager' Story as Data (HEINEKEN Ireland Back-Story)

HEINEKEN Ireland is one of Ireland's leading beer and cider companies, with a heritage dating back to 1856. In 1983, it joined the multinational HEINEKEN Company, which is the world's second largest brewer. HEINEKEN Ireland employs approx. 400 people and produces a portfolio of household name brands including Ireland's No. 1 lager Heineken®, Heineken®0.0%, Birra Moretti, Orchard Thieves, and a range of stout, craft, and variety beers, with the portfolio generating annual sales of over €1bn at retail level.

The first steps towards transforming to a data-driven organisation were made by HEINEKEN Ireland in 2013 with the launch of its strategic '*Analytics Vision*' to advance the organisational BA maturity by delivering '*better descriptive analytics*' (more effective and more efficient) and '*more advanced analytics*' (scaling up from existing small-scale experiments to operationalizing and embedding advanced analytics). The organisation matured from having little to no BA capability in 2011 to, by the end of 2020, winning the industry peer-voted "Implementation of AI Award" at the Analytics & AI Awards (run by the Analytics

Institute of Ireland – the national analytics professional body). In the words of the Data & Analytics (D&A) Manager, “*being recognized as a leading center for BA was a significant moment of **external validation**, evidencing that we were now indeed delivering impactful BA*”. In 2013, the case for BA was (at that time) not yet proven in HEINEKEN Ireland, so there were no additional resources forthcoming to invest in BA capability. Chasing ‘*better descriptive analytics*’ meant not only better effectiveness but also better efficiency, with the intention that the efficiency gains would allow the existing level of D&A team resource to be redeployed to deliver the ‘*more advanced analytics*’. The *Better-More ‘Analytics Vision’* outlined how the transformation was to take place across five pillars, namely: (i) build a solid foundation of data upon which to apply the analytics, (ii) deploy the IT tools to effectively process the data, (iii) align the Data & Analytics (D&A) Team structure to future business needs, (iv) develop analytical capability & skills, and (v) embed analytics throughout the business.

In 2015 HEINEKEN Ireland launched a new business strategy, and for the first time, ‘*Analytics*’ was included as a key strategic enabler to delivering the business strategy. Further recognition of the growing importance of BA was the fact that the D&A team, which was previously part of the business support function, was restructured as a standalone BA function. In 2016, three years after the launch of the ‘*Analytics Vision*’, HEINEKEN Ireland had undergone somewhat of a transformation. The *descriptive analytics* capability had been transformed from a previous reliance on manual excel based reports (which hadn’t contained any visualization beyond color coding positive numbers ‘green’ and negative numbers ‘red’) to a situation where all routine reports and dashboards (*descriptive analytics*) were automated based on the Microsoft BI stack with new standards of visualization and interactivity, which far exceeded the initial business expectations (set out in 2013). However, by the end of 2016, it became clear that progress in developing the BA capability had stalled and the organisation had not yet achieved its goal of being a data-driven organisation. The D&A team was resource constrained and unable to focus on ‘*advanced analytics*’ as expected, due to the exponential increase in demand for the new

‘descriptive analytics’ solutions. This demand was driven by business enthusiasm for the new standard of solutions being delivered. Furthermore, while some of the new *‘advanced analytics’* solutions were well received and utilized, it was apparent to the D&A Manager that a *‘gap’* had opened, to a degree, and that most *‘advanced analytics’* solutions were not being operationalized by the business. HEINEKEN Ireland senior leadership was also starting to get frustrated as they had expected *‘advanced analytics’* to be transforming business processes and delivering significant value to the bottom line (at that stage in 2016).

Origins of the Business Analytics Recipe (BAR)

Given the sense of a slowing transformative pace, in late 2016, the HEINEKEN Ireland D&A team decided to stop, assess where they were, identify the learnings from what was implemented in the business with the intention of helping to plot a way forward. A D&A team retrospective, to harness the learnings from their own practical experiences, produced the first version of the ***Business Analytics Recipe*** (BAR). The retrospective involved the team members brainstorming what changes had been implemented over the previous four years, what had worked and what hadn’t turned out as expected. For example, one of the positive changes was a new way of working resulting from Agile where solutions were now developed in conjunction with and in partnership with the business stakeholders, as opposed to the D&A team developing solutions in response to requirements received from the business. This would later be refined to form the Business Engagement element and is located at the center of the BAR. In contrast, one of the challenges highlighted was the observation that while the business was enthusiastic about the Descriptive Analytics solutions, this was not generally the case when it came to the Advanced Solutions. Team members vented their frustration through phrases such as *“They don’t care”* and they’re *“not interested”*. It was agreed that this was the biggest challenge to be overcome if the organisation was to realise its vision of *‘more advanced analytics’*. Once all the items had been surfaced, the team then collectively prioritized them, and upon completion of

the prioritization, a pattern was observed with all items related to the business value of BA grouped at the top of the prioritized list, followed by items related to people and processes, and then finally the data and technology items.

Thereafter, version two of the BAR emerged in 2018, produced after a series of socializations internally within HEINEKEN Ireland and externally with groups of mid-senior executives from other organisations, and an ongoing engagement with the academic literature. The D&A team retrospectives and the series of socializations (throughout 2017) were facilitated by the D&A Manager in HEINEKEN Ireland (who is the first author on this paper). Between 2017 and 2020, the BAR was utilized to provide the guiding principles for BA within HEINEKEN Ireland and was found to be useful at both the macro-organisational level and at the micro-individual (analytics use case) level. The communication of the BAR to stakeholders, (particularly senior stakeholders whose sponsorship and support for BA is critical) was initially complex as they struggled to comprehend the multiple elements. However, as analogies are widely used as a tool to aid communication by making complex ideas more comprehensible (Leuzzi & Ferilli, 2017), the BAR was communicated across the organisation in the form of an analogy of '*baking a cake*'. The cake ingredients of flour, eggs, etc., are analogous to data, and tools such as mixing bowl, oven, etc., to the technology required to collect, store, analyse and present data. In the same way that just having ingredients and tools is not enough to bake a cake without the people who have the skills and knowledge to bring the ingredients together in the right way, organisations also need a selection of D&A skills and knowledge to deliver BA. Furthermore, there is no point baking any cake unless it is eaten, as it is only at the moment that the cake is eaten and enjoyed by someone that the value is realised. Similarly, it is pointless to produce BA outputs unless they are actioned to improve business performance. Finally, the environment or kitchen in which the cake is baked will impact on the standard of cake produced, and so too is having the right organisational environment or culture critical to the success of BA.

In the next section we present the elements of the BAR and the associated CSFs to deliver impactful BA.

Findings & Discussion: The CSFs for Impactful BA (Stage One Outputs)

In this section we present the elements of the *Business Analytics Recipe* (BAR) and the associated CSFs. The journey of HEINEKEN Ireland as it developed its BA maturity from 2011 to 2020 is discussed in more detail by O'Driscoll et al. (2023), where the focus of this paper is solely on the learnings (presented here as CSFs) and linked to each of the BAR elements. The twelve CSFs are organised across three layers (Business Value, People & Process, and Solid Foundations) and are each linked with one of six BAR elements. Based on our analysis there are three CSFs associated with the business value layer, six CSFs associated with the people & process layer, and three CSFs associated with the solid foundation layer. The importance of the organisational culture layer is also discussed. The twelve CSFs are now presented by BAR element. These twelve CSFs have emerged from the ongoing documenting and analysis of the first author's personal experiences (over the ten-year period), as the D&A Manager within HEINEKEN Ireland. These twelve CSFs are not the only CSFs to deliver impactful BA within a traditional organisation, but "*they are 'the twelve' most important CSFs*", based on the auto-ethnographic accounts of a D&A Leader within a traditional organisation.

Actionable Business Value

Actionable Business Value was ranked by the HEINEKEN Ireland D&A team as the top priority element in the BAR and there are three associated CSFs. The principle of Actionable Business Value is that the purpose of BA is not the production of the BA outputs but rather the impact on the organisation's performance resulting from the production and consumption of those outputs. Ensuring that BA is actioned is critical to realise value but this human factor is not only often overlooked, it is also challenging as decision makers often prefer to rely on their own past experiences for making decisions, especially when the

BA outputs differ from their own opinions (Zamani et al., 2021). Therefore, the BA must address business problems which are aligned to the business strategy, must be actionable by decision makers and must deliver a demonstratable improvement in organisation performance.

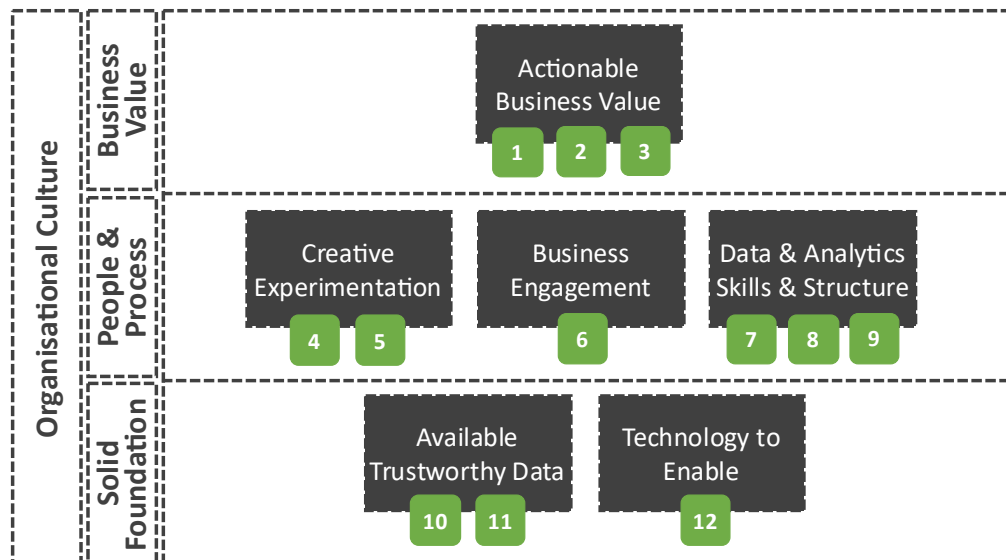


Figure 8: Conceptual Model: Business Analytics Recipe (BAR) with associated CSFs

CSF#1: Align business and analytics strategies to balance the ‘capacity to produce’ with the ‘ability to apply’.

This CSF calls for synchronization between the business and the D&A teams in terms of which business challenges are prioritized to be addressed by BA and what solutions will be developed. Based on the Lead Authors reflections, business decision makers will only be motivated to consume the BA outputs, if firstly they are closely linked to the business strategy - solving problems the business is interested in solving, and secondly the BA outputs must match the ability of the end users to understand and consume them. Therefore D&A teams need to jointly decide with the business leaders which problems to prioritize BA effort on (Chen & Nath, 2018; LaValle et al., 2010). Furthermore, to address the potential gap between the sophistication of the BA which the organisation may be capable of producing and the ability of the decision makers to consume the outputs, which Ransbotham et al. (2015a) termed *"The Analytics Gap"*, the BA

outputs need to be appropriate to the business context, easy to understand for the business decision maker and it must be clear to them how they are expected to action those outputs (Davenport, 2015; Namvar et al., 2021). Elevating Actionable Business Value to be the top consideration for the HEINEKEN Ireland D&A team led to significant changes in the activities prioritized by the team and how they approached the projects they undertook. From one side this was by ruthlessly focusing on activities which were closely aligned with the business instead of activities which further widened the Analytics Gap. BA use cases which were interesting from a D&A perspective but not aligned with the top business priorities at the time, were deprioritized, or cancelled, including a partnership with Microsoft to develop an innovative computer vision solution. This was a difficult decision for the D&A team who got great satisfaction from working on cutting edge analytics projects and developing their own technical analytics skills. The Analytics Gap was addressed from both sides by intentionally delivering simpler, less sophisticated BA solutions, where necessary to match the ability of the customer group, while also increasing the capabilities of end users through cocreating BA solutions with them to increase familiarity with BA and providing upskilling activities such as ‘Lunch & Learn’ sessions or organizing data focused workshops with senior leaders. The benefits were soon realised however, as the closer alignment resulted in increased support from business management and greater implementation of BA products.

CSF#2: Start with understanding the business decision being made to ‘deliver actionable insights’ as opposed to the ‘available data first’.

This CSF calls for D&A teams to spend time exploring and aligning on the business questions and clarifying how decision makers will action the BA outputs to do something different, and that this needs to be done before considering the available data or existing BA capability. An analysis of the lead author’s experience showed that starting with available data and sequentially following the Information Supply Chain from data to analysis to presentation restricts innovation and often results in less than optimum BA solutions. As the D&A Manager in HEINEKEN Ireland, it used to be frustrating to hear D&A team

members say, “*I’ve given him all the information he needs – it’s all there – he just needs to . . .*”. The problem with this approach is that if a business decision maker “*just needs to . . .*”, then they probably won’t, and will instead revert to making the decision based on their intuition. For example, HEINEKEN Ireland Sales Reps used to have a dashboard which very effectively visualized all the available market share data down to customer level by brand, pack type, product category etc., but the Sales Reps needed to take the information and conduct further analysis to identify the opportunities. By fully understanding the business decisions to be made by the Sales Reps, an alternative BA tool was developed which used clustering to identify the customers with the best growth potential, analysed data from various sources (including external) to recommend bespoke actions for the sales rep to take in each customer, which were then explained and presented in a clear visual easy to understand dashboard. By consciously shifting the approach to business question first, exploring data which could help second and only then looking at the data which was available, the team was able to develop more impactful and valuable use cases, which resulted in much higher rates of utilization and value delivery.

CSF#3: Establish clear ‘Line of Sight to Value’ and evaluate the impact of your BA use cases.

This CSF calls for the measures of success for how BA use cases will deliver business value to be aligned before any use case is started and follow through with transparent tracking and communication of the value delivered. The purpose of BA is to deliver value to the organisation by improving decision making which then results in better business performance. Based on the lead author’s experiences, business sponsors of BA are not interested in the BA solutions themselves - it is all about the value impact delivered. There are many different types of value which BA can deliver ranging from efficiency savings to increased revenue or market share to improved customer loyalty (Baecker et al., 2021). As the D&A Manager in HEINEKEN Ireland, it was interesting to observe that business stakeholders always agreed that any proposed BA solution needed to deliver value, but when challenged they often struggled to articulate how it would do so. Therefore, the process of exploring and refining the business

question to be answered for each use case included agreeing with the business stakeholders how the impact can be measured. While the preference was always for hard measures such as increased revenue or cost reduction, this was not always practical. Other examples of measures which were used included customer satisfaction score or time to complete a process, but often a combination of measures was agreed upon to determine if the BA use case was successful. The process of agreeing the measures of success with business stakeholders proved useful in providing clarity up front to determine if the use case is likely to deliver real value or is just a ‘feel-good’ project. Measuring and then communicating the value delivered by the BA use cases is essential to increase engagement and support across the wider organisation for subsequent use cases.

Creative Experimentation

There are two CSFs associated with this BAR element which could be described as the ‘secret ingredient’ for BA success and refers to adopting an approach of experimentation to quickly develop innovative solutions. It calls for a mindset which challenges the status quo, explores new ways of achieving results, comfort with ambiguity and a start fast and small approach where failure is not only acceptable but viewed as “success in progress” and recognized for the learnings that it provides.

CSF#4: Leverage the power of Design Thinking for innovation.

This CSF calls for the intentional and systematic application of Design Thinking to understand requirements and quickly put pretotypes and prototypes into the hands of end users to fail fast and develop innovative solutions. Based on the lead authors experience, BA is often called upon to solve business problems which as well as not being clearly defined by the business users, have not been solved before (at least not in a data-driven / informed way), so the solution is far from clear, thereby requiring a creative approach. Design Thinking is a structured innovation process which covers ways to explore the opportunity space, conceive potential solutions and implement the best solution to meet the needs of users. It helps teams to innovate and deliver solutions which are revolutionary

rather than just evolutions of existing solutions (Brown & Katz, 2011; Chongwatpol, 2020). As the D&A Manager in HEINEKEN Ireland, Design Thinking was selected as a method to improve innovation and was implemented in the way the D&A team approached BA use cases. For example, when tasked with developing a new BA solution for field Sales Reps, D&A team members first went into the field with the Sales Reps to understand the business objective, the challenges faced by the users, and the context of the environment which the Reps would be in when using the solution. A workshop with a group of Reps to explore and refine the business question as well as explore solutions followed with prototypes immediately put in the hands of the users. This low fidelity testing and cocreating of the solution enabled fast testing of concepts and low-cost pivoting which resulted in an innovative solution with high adoption rates and delivered much quicker than previously possible.

CSF#5: Invest time in ‘fail-fast exploratory projects’ to refine problem solving capabilities.

This CSF calls for D&A teams to allocate time to exploring new and latest best practices. In the lead author’s experience, there was normally a time pressure associated with any BA use case which brings a temptation to rely on tried and trusted approaches which have worked in the past. This is particularly the case in a large traditional organisation with a long heritage and track record of success which can therefore be slow to change a previously winning formula and look to new methods. Traditional organisations are coming from a place where failure is seen as something to be avoided, but to become data-driven they need to embrace a mindset of systematic experimentation along with the associated learn, pivot and iteratively improve approach, within an environment where it is not only acceptable, but insisted upon to try new things and it is safe to fail (Angevine et al., 2021; Carillo, 2017; Davenport, 2013). One of the ways this CSF was brought to life in HEINEKEN Ireland was to allocate people ‘Explore Projects’, where they were challenged to either improve an existing BA solution (for example using Robotic Process Automation to automate the calculation of discounts for customers) or develop new solutions (such as using Natural Language Processing to analyse records of calls between customers and the call

center), for potentially interesting but not operationally critical business problems. As the explore projects did not impact business operations, people were free to push the boundaries as they had the freedom to fail. However, when these projects failed there were always learnings which were then reapplied to the benefit of other BA use cases and when the projects were successful, they were quickly operationalized to deliver business value.

Business Engagement

At the center of the BAR is the Business Engagement element. In large traditional organisations, D&A people need to collaborate with other business players to deliver value from BA which is in contrast to digitally native organisations, especially where data or data solutions are the product, where they can often assume end to end responsibility (Davenport, 2013). Shortcomings in the engagement model between BA and business people often leads to BA failure (Chuah & Wong, 2011). It is essential that the BA teams continuously communicate and work closely with the business decision-makers to deliver appropriate trustworthy BA solutions (Namvar et al., 2021; Redman, 2022).

CSF#6: Strive to make Agile 'best practices' more 'common practices' for best BA impact.

This CSF calls for D&A teams to embrace an Agile mindset and adopt Agile as the method of delivering BA solutions. Based on the lead author's experiences, technical development teams can be very comfortable with the waterfall project management approach where they receive documented requirements which they can work on in isolation and their performance is assessed on delivery against those requirements, rather than the business impact of the solution delivered. At the same time the business stakeholders, sitting in their own silo get frustrated at the length of time it takes for delivery and often complain that the solution fails to meet expectations, and the developers don't understand the business requirements. Adoption of Agile, which includes practices for project management and ensuring effective collaboration with business stakeholders (Collier, 2012) has been shown to increase engagement leading to greater involvement of business stakeholders (Sammon & Nagle, 2013). As the D&A

Manager in HEINEKEN Ireland it was important to adopt an approach which increased the engagement of business owners and speeded up the delivery, adoption, and effect of BA solutions. Adopting Agile was initially a culture shock for the D&A team members who came from a traditional IT background, and it took about two years before Agile was fully embraced and embedded. However, the result was that in addition to the D&A team members building their business understanding, and the BA solutions becoming much more closely aligned to business requirements, the business stakeholders were observed to take more ownership of the solutions, seeing them as their own and therefore, using them more. Whenever a new solution was being launched to the wider business, it became common practice for the business Product Owner rather than someone from the D&A team to lead the presentations to end-users.

Data & Analytics Skills & Structure

There are three CSFs associated with this BAR element which addresses the need to obtain data & analytics talent. While this requirement might seem obvious, it soon becomes more complicated – what skills exactly does the organisation require, how should they be structured, should they be outsourced or insourced, how should they be organised and how best can they be acquired and retained. As more organisations attempt to build BA capabilities, the demand for BA talent has increased (Ransbotham et al., 2015b).

CSF#7: Recruit internally (existing employees) and invest in their D&A ‘skillset development’.

This CSF calls for organisations to recognize their existing talent pool as a valuable source of D&A skills and to invest in developing their existing talents who already understand the business and have the interest and aptitude for BA. Based on the lead author’s experiences, when large traditional organisations are competing in the same talent market as top software or digitally native companies, it is difficult to attract talent and it can become commonplace for successful candidates to refuse job offers, in favor of what they perceive to be more interesting roles in those digital organisations. This global shortage of D&A talent is one of the key challenges which is hampering organisations develop

their BA capabilities (Carillo, 2017; Nalchigar & Yu, 2020). As the D&A Manager in HEINEKEN Ireland it was imperative to adopt a different approach to obtaining D&A talent, so the decision was taken to recruit based on potential rather than existing skills. This opened up D&A roles to existing people within the organisation and a program was put in place to develop the required D&A skills for the internally recruited team members. This was a combination of formal and informal training and providing opportunities for on-the-job learning. Over a three-year period, more than half the team were supported to complete an MSc or HDipSc in D&A areas such as Data Science, Business Intelligence, or Data Business. Furthermore, the entire team was engaged in a program of continuous learning comprising short online training courses and attending conferences and events such as those organised by the professional associations, industry bodies and BA vendors. The leveraging of these external sources proved very useful not just for developing practical capabilities but also providing an external view and inspiration which promoted a cultural shift in the team.

CSF#8: Source external resources to build 'new technical capability' within the D&A team.

This CSF calls for organisations to accelerate the learning process of D&A teams by working in partnership with external specialists to co-create initial solutions when deploying new technologies. Based on the experience of the lead author, D&A teams can face a steep learning curve when introducing new BA technology which presents two challenges. Firstly, deployment of solutions takes longer than expected and secondly the initial use cases are often less than optimal which then need to be reworked after the team has learned a better way of doing things. While not a substitute for developing their own talent pool, outsourcing can be a good way for organisations which are missing specific skills to catch up and fill in the knowledge gaps (Ransbotham et al., 2015b). As the D&A Manager in HEINEKEN Ireland it was important to improve the effectiveness of the D&A team resource by reducing the amount of time spent figuring out the best way to work with newly introduced technologies. The solution was to form strategic partnerships with BA technology specialists which could be called upon whenever the internal team faced new challenges. For example, when starting

out with PowerApps an external contractor was hired to build the first few apps in conjunction with the D&A team members. It was a condition of the contract that the specialists worked regularly from the HEINEKEN Ireland office as the primary focus was on accelerating the capability building within the team rather than the development of the initial apps themselves. This *‘supported learning by doing’* approach was much more effective than relying solely on structured training for technical skills knowledge transfer.

CSF#9: Feed the D&A talent pipeline by building employer brand through ‘closer relationships’ with HEIs and wider D&A community.

This CSF calls for organisations to proactively establish connections with potential future recruits and build their employer brand by establishing strong links with Higher Education Institutes (HEIs) and playing an active role in the D&A business community. Based on analysis of the lead authors experiences, traditional organisations can struggle to compete in the market for BA talent and frequently lose out to more digitally native organisations. Ransbotham et al. (2015b) found those organisations which have been successful in maturing their BA capability are already active in this space and tend to focus on sourcing talent direct from universities. HEINEKEN Ireland launched an internship program in 2017 and despite being widely advertised, there were only 10 applications for the D&A role. As the D&A Manager, it was important to improve the attractiveness of HEINEKEN Ireland as an employer of choice in the D&A space which was achieved by forging closer relationships with the universities offering D&A courses. This was achieved by becoming a regular guest speaker at courses, engaging in program review sessions, and HEINEKEN Ireland also got involved in supporting final year projects. The result was extraordinary, as by 2019 the intern program attracted over eighty applications from graduates and the caliber was very high. As at time of writing, interns recruited from that year have been retained by HEINEKEN Ireland in permanent roles and are consistently delivering high performance. In a similar way that HEINEKEN Ireland raised its profile in universities, it also put a program in place to raise its profile amongst the industry community. This involved contributing to and hosting industry events such as showcases, awards, seminars, etc. in conjunction with

industry and professional associations in the analytics and business excellence space. Attendees at these events often commented that they had not expected a company like HEINEKEN, from a traditional industry, to be engaged in advanced analytics. This increased profile resulted in D&A professionals reaching out to HEINEKEN Ireland enquiring about potential opportunities to join the D&A team and has led to successful recruitment outcomes.

Available Trustworthy Data

There are two CSFs associated with this BAR element which is to ensure that the organisation has access to the right data and that data is of sufficient quality to enable business decisions to be made with confidence.

CSF#10: Reward organisational data creators for 'right-first-time data capture'.

This CSF calls for Data Creators to be held accountable for data quality issues, and incentivised for good data quality, to ensure they take ownership of the quality of their data. Based on the lead authors experiences, data cleansing to fix issues on an ad-hoc basis is not a sustainable remedy without addressing the root cause of why the data needed cleansing in the first place. Data quality is not the preserve of just the D&A or IT teams, and organisations need to ensure that data owners, creators and users across the business assume responsibility. Getting data right first time and keeping it clean requires the data creators to have skin in the game of data quality. The unfortunate reality today is that in many organisations, the data is not of sufficient quality to enable decision makers rely on BA with confidence to inform their business decisions (Ransbotham et al., 2016; Redman, 2021). As the D&A Manager in HEINEKEN Ireland it was important to ensure high data quality so that the end users had the confidence to rely on the BA solutions for their decision making. However, the amount of D&A team resources allocated to data cleansing activities was unsustainable and was demoralizing for the team. While technology in the form of data management tools and process improvements leveraging Lean Six Sigma were introduced, one of the most impactful initiatives was changing the reward structures for business stakeholders who were data creators. For example, Field Technical Reps and Sales Reps were bonused on their performance against data

quality KPIs. Due to the introduction of these data quality KPIs, accuracy of a key database storing details of assets deployed on customer premises increased from 90% to 98%.

CSF#11: Develop an ambitious data strategy that promotes the use of 'new types of data'.

This CSF calls for organisations to expand their repertoire of data sources beyond traditional internal sources such as ERP or CRM systems. Traditional organisations now have access to significant amounts of external data which can provide insights related to consumers, customers, and competitors, which become particularly valuable and unique when that data is combined with the organisation's internal data. However, most traditional organisations are still not realizing the potential of these data sources (Benavides et al., 2017). HEINEKEN Ireland developed a data strategy which enabled BA solutions routinely combining external data and internal structured and unstructured data. Some of this external data is relatively easy to obtain as is published online such as weather, economic or demographic data. Even so, the organisation still needs to look for it and have the capability to collect, store and analyse it. For example, during the Covid pandemic, HEINEKEN Ireland was trying to plan production in an uncertain market so needed to understand how consumers were reacting to the various stages of restrictions. Pedestrian footfall data by street by hour is available for some major cities, so adding this new data source to existing sources generated rich insights which resulted in forecast accuracy significantly outperforming HEINEKEN Ireland's peer organisations across Europe. In other BA use cases, data gaps were filled through a combination of technology and process changes. For example, to obtain data on the layout of customer outlets, the D&A team developed a new feature within the Sales Rep Reporting App to use the camera on Reps phones to take pictures in outlets which were then able to be analysed for use in BA use cases. HEINEKEN Ireland also enjoyed some success by proactively exploring the opportunities to utilize data available by partnering with external companies such as Telecommunications, social media, and IOT providers.

Technology to Enable

Along with Availability of Trustworthy Data, Technology to Enable forms the Solid Foundation layer of the BAR. The technology area is vast but the focus of this research is on organisational capability rather than technology but there is nonetheless a CSF associated with this BAR element.

CSF#12: Enable D&A team solution delivery through introducing ‘fit-for-purpose technology’.

This CSF calls for investment in enabling technology and for the investment choices to be business requirement led rather than technology led. Based on the lead author’s experiences, while technology is not a primary driver of BA capability, it is nonetheless an important enabler, because without secure, efficient, robust, and effective technology solutions, it is not possible to deliver impactful BA. The BA technology landscape is evolving rapidly, but despite the critical enabling role for BA and the value which they can deliver, most organisations are finding it difficult to implement new BA technologies (Redman, 2021). As the D&A Manager in HEINEKEN Ireland, technology was the first CSF to be addressed (and possibly the easiest) as part of the ‘*Analytics Vision*’, because the absence of enabling technology was a clearly visible blocker to delivering BA. The strategy was to adopt a holistic approach to the BA Technology landscape and avoid investing in stand-alone technology solutions, while also aspiring to remain as technology agnostic as possible. Rather than starting off by taking on a significant BA technology investment, the technology landscape evolved at a pace aligned with and in response to the developing BA capability of the organisation. For example, to overcome the shortcomings of excel for descriptive analytics, the Microsoft BI stack was deployed. Predictive and prescriptive analytics were initially enabled by drag and drop no-code tools such as RapidMiner before giving way to the open-source platforms of R and Python as the D&A team skills advanced, before moving on to Azure ML.

Organisational Culture

A data-driven culture is one in which important business decisions are made based on BA (Smith et al., 2019) and even though it is a critical element of BA

capability to ensure success (Popović et al., 2012), it is possibly the most difficult of the BA capability elements to establish (Smith et al., 2019). While the focus of this paper is on twelve CSFs associated with the *Business Value, People & Process* and *Solid Foundation* layers of the BAR, we nonetheless feel it is important to refer to Organisational Culture given its criticality in developing a BA capability (see Figure 8) by the fact that it goes across all the other elements of the BAR. In the words of the Data & Analytics (D&A) Manager in HEINEKEN Ireland “*all of our data-driven successes in HEINEKEN Ireland – the eating of our cake – are only possible because the culture has evolved such that data driven decision making has become the way we do things*”. Based on the reflections of the D&A Manager, it is clear that without all the layers of the BAR in place and working together, it would not be possible to have a data-driven organisational culture. But just having those elements in place is not enough to ensure that the organisational culture is data-driven. Returning to the title of this paper, and the use of the analogy of ‘*bake the cake*’, if you wish to bake a cake, while having the ingredients, the tools, the baking skills, processes, and ways of working are all essential for success, it is not enough unless they all come together in a cohesive way in the right organisational environment. Similarly having the right combination of tools, data and people, while necessary enablers, is not enough to deliver a successful data-driven transformation (Kiron & Shockley, 2011; Smith et al., 2019).

Based on the experiences in HEINEKEN Ireland, addressing the CSFs outlined in this paper creates a virtuous circle such that addressing the CSFs develops capability across the BAR, which improves the culture, which accelerates the impact of the CSFs, which further improves the culture, and so on. For example, adopting agile practices and co-creating solutions with business users increases data literacy and comfort with BA across the organisation which is necessary to build a data-driven culture. As the culture becomes more data-driven, business users become more engaged in the process of co-creating BA solutions. Likewise, as the culture becomes more data-driven, data creators tend to take more ownership for ensuring data is right first time, technology decisions are

made more on the resulting BA impact as opposed to ‘technology for the sake of technology’, and so on. The culture in the organisation creates the overall environment in which everything else takes place. The significant difference in the evolution of the BAR in HEINEKEN Ireland from version one to version two was the addition of the separate but all-encompassing Organisational Culture layer. The other three layers are much more tangible in that technology, data availability, people and their skills, organisational structure, ways of working and processes, the value delivered from BA use cases can all be touched, viewed, or measured and action can be taken to make changes. However, organisational culture defined by Carillo et al (2019, p. 567) as the “*set of beliefs, values and assumptions that are shared by members of an organisation and taught to newcomers as the proper way to think and feel*” is much less tangible and cannot be changed simply by implementing a new process or investing in some technology. Additional actions prioritized in HEINEKEN Ireland to develop the culture included engaging and equipping senior leaders to play their role as data-driven evangelists and sponsors through tailored upskilling (organisational culture change needs to be driven from the top), establishing and communicating BA as a central part of the overall business strategy, and the implementation of a change management program to increase data literacy and promote a data-driven mindset across the organisation. Furthermore, the D&A team itself, exploring and redefining its own purpose, from just delivery of BA solutions to drivers of value and BA capability across HEINEKEN Ireland.

Evaluating the CSFs to appreciate their relevance (Stage Two Outputs)

While the CSFs presented in the preceding sections were identified by coding the first-person autobiographical phenomenological accounts of the D&A Manager, reflecting on the creation of the BAR and its utilization in developing the BA capability in HEINEKEN Ireland, the need to expose these findings to a further external challenge was deemed important to ensure their relevance to practice. Therefore, the evaluation of each of the twelve CSFs by 12 stakeholders (Business & IT Strategic and D&A team members) who were each

involved in the development of the HEINEKEN Ireland BA capability during the years 2011 to 2020, was a critical step. As presented in Figure 9, the results of the survey highlight that all 12 CSFs receive a medium to high importance rating. The lowest score of all the CSFs was 2.0, which equated to a medium importance. It is interesting to note that of the top three ranked CSFs, there is one from each of the BAR layers of 'Business', 'People' and 'Foundation', with 'Business' occupying the top spot. This pattern then repeats for subsequent CSF rankings which would appear to validate the BAR principle that to develop a BA capability, organisations need to adopt a holistic approach rather than focusing on a particular element such as technology or hiring people.

CSF	Rank	Mean Score			High	Medium	Low	BAR Layer	BAR Element
		Overall	Strategic Leaders	D&A Team					
CSF#1: Align business and analytics strategies to balance the 'capacity to produce' with the 'ability to apply'.	1	2.83	3.00	2.67	10	2	0	Business	ABV
CSF#7: Recruit internally (existing employees) and invest in their D&A 'skillset development'.	2	2.75	2.67	2.83	9	3	0	People	DASS
CSF#12: Enable D&A team solution delivery through introducing 'fit-for-purpose technology'.	2	2.75	2.83	2.67	9	3	0	Foundation	TE
CSF#3: Establish clear 'Line of Sight to Value' and evaluate the impact of your BA use cases.	4	2.50	2.50	2.50	6	6	0	Business	ABV
CSF#6: Strive to make Agile 'best practices' more 'common practices' for best BA impact.	4	2.50	2.50	2.50	8	2	2	People	BE
CSF#11: Develop an ambitious data strategy that promotes the use of 'new types of data'.	4	2.50	2.83	2.17	7	4	1	Foundation	ATD
CSF#2: Start with understanding the business decision being made to 'deliver actionable insights' as opposed to the	7	2.42	2.83	2.00	7	3	2	Business	ABV
CSF#4: Leverage the power of Design Thinking for innovation.	8	2.33	2.50	2.17	5	6	1	People	CE
CSF#10: Reward organizational data creators for 'right-first-time data capture'.	8	2.33	2.67	2.00	5	6	1	Foundation	ATD
CSF#8: Source external resources to build 'new technical capability' within the Analytics team.	10	2.17	2.33	2.00	3	8	1	People	DASS
CSF#5: Invest time in 'fail-fast exploratory projects' to refine problem solving capabilities.	11	2.08	2.17	2.00	3	7	2	People	CE
CSF#9: Feed the Analytics talent pipeline by building employer brand through 'closer relationships' with Higher Education Institutes and the wider Analytics community.	12	2.00	2.17	1.83	3	6	3	People	DASS

Figure 9: The CSFs Mean Ranking by 12 Case Company Stakeholders

The more senior stakeholders holding strategic roles (4 functional directors and 2 IT leaders) considered the CSFs to be more important than did the members of the D&A team. The strategic group gave a 'High' rating in 63% of instances compared to just 42% of instances for the D&A team members. Two of the CSFs driving this difference were CSF#2 and CSF#11, indicating that the D&A team may be more inclined to follow a traditional data-first approach, i.e., analyse and present the available data rather than understanding business requirements first and developing more innovative solutions. The D&A team also rated CSF#10 lower, while the business leaders were more inclined to recognize the role of data creators in the overall holistic BA capability of the organisation. These survey findings resonated with the D&A Manager (lead author) and highlight the challenges that can be faced developing a more business oriented innovative mindset amongst highly experienced technically focused teams.

Conclusions, Implications & Future Research

In this paper we advance the first comprehensive conceptualization of the CSFs to deliver impactful BA in a traditional organisation. This is an important first step towards the creation of a set of conceptual elements that can inspire further study. To conclude this paper, it is important to return to the '*bake the cake*' analogy, again. Once a cake is baked, all the effort of gathering the ingredients, baking it, and presenting it still means nothing until someone eats the cake. It is only at this point that the cake delivers value and the effort to produce it is worth it. So, to '*bake the cake*' is analogous to delivering BA, but the 'impactful' part of delivering BA is akin to the fact that the cake only delivers value when it is eaten. Therefore, delivering impactful BA only happens when a decision maker takes an action, which would not otherwise have happened, which leads to a positive business outcome.

In pursuing a robust research design, we aim to provide a description of how the data was gathered and analysed, leading to the emergence of the 12 CSFs (positioned on the BAR). Seeing as the lead author was the 'executive in charge' of the BA Transformation within the case company, we also want to ensure that

they are not the sole source of data in this research, therefore, we play the CSFs back to other independent stakeholders within the case company to further elevate the importance of our work. It is reported that '*importance*' is the most critical dimension of relevance for IS practitioners. Similar to (Rosemann & Vessey, 2008, p. 3) we view importance as research that "*meets the needs of practice by addressing a real-world problem in a timely manner [currently significant], and in such a way that it can act as the starting point for providing an eventual solution*". Therefore, throughout our inductive approach, we have maintained an "*analytical discipline*" producing "*credible interpretations of data*" and conclusions that are both "*plausible and defensible*" (Gioia et al., 2013, p. 15). These theorising efforts produce twelve CSFs, and we argue that these CSFs (to deliver impactful BA in a traditional organisation) are provided by a practitioner for practitioners, and this should improve the consumption of our work by IS practitioners, given its relevancy. Extending this idea of *importance* even further, our research presents the raw materials of a method for practitioners to evaluate their respective efforts in delivering impactful BA. Through simply undertaking a self-assessment exercise on the *presence* or *absence* of the CSFs documented in this paper, a BA leader's level of awareness will be raised as to the importance of previously unknown factors (if absent) in their organisational context. Furthermore, similar to the arguments made by Sammon and Adam (2008), in the context of ERP projects, such awareness of the CSFs would increase the organisations likelihood of achieving the desired expected outcomes (from becoming an analytics-driven organisation).

Our recommendation to practitioners in other traditional organisations, who are seeking to advance their BA capability, is to utilize the twelve CSFs in a three-step process (*Socialize – Assess – Define*). Firstly, *socialize* the CSFs to a wide group of stakeholders, not just the senior leadership, but also stakeholders from across the Data & Analytics Team(s) and business functions, who are involved in delivering value from BA (the bakers and consumers of the cake). During this stage it is important to recognize that the CSFs presented in this paper are those which were relevant for the data-driven transformation of HEINEKEN Ireland, so

consideration needs to be given to each organisational context, which may require the CSFs to be adjusted for idiosyncrasies. Once a set of organisationally relevant CSFs is arrived at, the next step is to critically assess the existing ‘state of BA play’ against those CSFs. This is then followed by the third step which is to *define* an action plan to advance capability across all elements of the BAR (*Business Analytics Recipe*). Finally, and possibly most importantly, is to act! Recognize that everything will never be perfect and the time to move is now, because in traditional industries – the competitors and disruptors are moving.

While our work presents a breadth of CSFs (organised against the BAR elements), more work can now be done to unpack these CSFs and look under the hood of each factor to better appreciate its role in delivering impactful BA in other traditional organisations. Furthermore, as the CSFs identified in this paper emerged retrospectively, we were unable to define contemporaneous KPIs to measure them. The transformation had already occurred, and performance measurement systems had not been designed to track these specific CSFs. Consequently, while CSFs were observed as necessary in retrospect, quantitative metrics did not exist at the time of implementation. In Table 12, we put forward potential KPIs per CSF, which while hypothetical in the context of this paper, represent a future research agenda focused on the operationalization and validation of BA transformation CSFs across various organisational contexts. Of course, more can also be done to evaluate if these twelve CSFs are transferable to other organisational contexts (e.g., digital start-ups).

CSF	Potential Future KPI	Implications for Research
CSF#1: Align business and analytics strategies to balance the ‘capacity to produce’ with the ‘ability to apply’.	% of projects explicitly linked to business strategy; stakeholder alignment scores	Explore strategic alignment frameworks in analytics maturity models
CSF#2: Start with understanding the business decision being made to ‘deliver actionable insights’ as opposed to the ‘available data first’.	% of analytics projects initiated with business question framing	Explore causality between decision-led framing and outcome effectiveness

CSF	Potential Future KPI	Implications for Research
CSF#3: Establish clear ‘Line of Sight to Value’ and evaluate the impact of your BA use cases.	% of BA projects with quantified value attribution	Develop valuation frameworks for BA initiatives
CSF#4: Leverage the power of Design Thinking for innovation.	# of innovation sessions applying design thinking; user satisfaction scores	Assess link between design-led methods and solution adoption
CSF#5: Invest time in ‘fail-fast exploratory projects’ to refine problem solving capabilities.	Time-to-failure metrics; % of POCs transitioned to scale	Study iterative learning and innovation speed
CSF#6: Strive to make Agile ‘best practices’ more ‘common practices’ for best BA impact.	% of teams using Agile methods; cycle time for delivery	Evaluate maturity models of Agile analytics
CSF#7: Recruit internally (existing employees) and invest in their D&A ‘skillset development’.	# of internal employees trained/certified in analytics; % BA roles filled internally	Examine talent transformation from within
CSF#8: Source external resources to build ‘new technical capability’ within the Analytics team.	% of projects using specialised external consultants	Identify dependencies on external knowledge
CSF#9: Feed the Analytics talent pipeline by building employer brand through ‘closer relationships’ with Higher Education Institutes and the wider Analytics community.	# of partnerships with HEIs; intern conversion rates; employer brand perception	Study employer branding in data ecosystems
CSF#10: Reward organizational data creators for ‘right-first-time data capture’.	% reduction in data rework; data quality scores	Validate incentive models for upstream data quality
CSF#11: Develop an ambitious data strategy that promotes the use of ‘new types of data’.	# of use cases using unstructured/third-party data	Examine frontier data use cases and value delivery
CSF#12: Enable D&A team solution delivery through introducing ‘fit-for-purpose technology’.	% of user satisfaction with BA tools; tool adoption rates	Explore usability and fitness of analytics platforms

Table 12: Potential KPIs to track implementation of BA CSFs

References

References are consolidated in References section.

Chapter 4 UNPACKING THE ‘BLACK BOXES’ OF ANALYTICS: A DATA VALUE MAP ANALYSIS

Paper Summary

Paper Summary Chapter 4 – Capability Building Unpacking the ‘Black Boxes’ of Analytics: A Data Value Map Analysis			
Peer Review	Analysis Method	Key Data	Key Contribution
UK Academy for Information Systems Conference 2024	Data Value Map	Interviews with key informants.	Framework to help identify strategy-execution gap.

Abstract

This paper reports on a three-stage research design pursued to uncover the shared understanding of practices linked to the execution of a Data & Analytics (D&A) strategy, within the HEINEKEN AME (Africa and Middle East) region. This research uses the Data Value Map (DVM) to present a visualised representation of the “experiential stories” of ten key informants. These key informants represent a snapshot of the important roles constituting the D&A team within the HEINEKEN AME region. The DVM analysis reveals eight ‘black boxes’ that represent the most frequently occurring topics of conversation across the ten key informant interviews. A reflection (by the Head of Data & Analytics for the AME region) on the impact of these ‘black boxes’ on the execution of the D&A strategy is also presented. The paper concludes with a sense of the practical implications linked to this applied research approach.

Keywords: Business Analytics, Strategy Execution, Capability, Traditional Organisation, Transformation, Reflective Practice

Introduction

In recent years there has been growing interest in Business Analytics (BA) amongst the researcher and practitioner communities (Delen & Ram, 2018; Hindle et al., 2020; Mikalef et al., 2020). Defined by Stubbs (2013) as the use of data-driven insight to generate value, BA has been associated with superior organisational performance (Cao & Duan, 2017) and recognised as a competitive differentiator for organisations across most industries (Akhtar et al., 2019; Bumblauskas et al., 2017; Davenport, 2006). It is no surprise therefore that senior executives are increasingly focused on transforming their organisations to become data-driven (Delen & Ram, 2018; LaValle et al., 2011a).

However, there remains much work to do, as organisations are struggling to become data driven (Davenport & Redman, 2020; Klee et al., 2021; Smith et al., 2019), with the New Vantage Partners (2023) Data and AI Executive Survey highlighting that less than 25% of organisations consider themselves to have already become data-driven. Traditional organisations, which were established in the pre-digital era and whose success has been achieved through non-digital business models, organisational structures and culture, face additional challenges, as their data-driven transformation can be impeded by those traditional structures and processes which had worked for them in the past (Gust et al., 2017).

HEINEKEN has a clearly defined data & analytics strategy to become a data-driven organisation. However, bringing strategies to life is a significant challenge for organisations, as they struggle to close the gap between strategy and execution, often as a result of differences in thinking between those who create the strategy and those tasked with implementation (Bonchek, 2017; Kenny, 2019; Wiita & Leonard, 2017). Teams which are more successful in closing the *strategy-execution gap* are more likely to spend additional time engaging in dialogue and involving the people responsible for the implementation (Bonchek, 2017; Wiita & Leonard, 2017). Therefore, the objective of this paper is ***to explore the strategy-execution gap of a regional unit within a global multinational organisation***

which is implementing a data and analytics strategy. In particular, the study aims to assess the level of shared understanding and identify the enablers and inhibitors to the execution of the strategy, as key determinants of the strategy-execution gap. The study is based on the “experiential stories” of ten D&A team members from the HEINEKEN AME region. Their respective *individual* stories are told through the lens of the Data Value Map (a discursive template to guide data/analytics conversations). These individual maps are then analysed (following an inductive open coding approach) to produce a *collective* story of the D&A strategy execution in the HEINEKEN AME region.

The remainder of this paper is structured as follows. In the next section we present the background to the case followed by an overview of the three-stage research design being pursued. This is followed by a presentation of our observations (eight ‘black boxes’) gained through coding the “experiential stories” of the ten HEINEKEN AME region key informants (members of the D&A team) in Stage Two of the research design. Furthermore, the reflections of the Head of D&A for the AME region, in response to this analysis, are then captured as part of Stage Three of the research design. Finally, the paper concludes with a reflection on the implications for practice.

Background to the Case

HEINEKEN is a leading developer and marketer of premium beer & cider, with a portfolio of more than 300 international, regional, local and speciality brands. It has grown from the small family-owned business established by Gerard Adriaan Heineken in Amsterdam in 1864 to being the largest brewer in Europe and the number 2 in the world. It employs over 80,000 people and operates production facilities in more than 70 countries. Since 2021 the lead author has been Head of Data & Analytics (D&A) for the Africa, Middle East (AME) region with responsibility for leading an organisational data-driven transformation and maturing the D&A capability.

HEINEKEN AME Data & Analytics Strategy

The HEINEKEN AME region comprises sixteen Operating Companies (OpCos) of various sizes ranging from large OpCos such as Nigeria, with many production sites and thousands of employees to much smaller OpCos with a single brewery and just a few hundred employees.

The Data & Analytics (D&A) strategy of the HEINEKEN AME region strives to unlock the value of data to achieve *HIGHER* impact on business performance, deliver *FASTER* time to insight, and grow a *STRONGER* organisation by holistically developing capabilities across the four pillars of the BAR (Business Analytics Recipe). The BAR outlines four pillars of business analytics capability, namely Solid Foundations (Data & Technology), People & Process (Skills, Org Structure, WoWs), Actionable Business Value (Analytics Use Cases which are actionable, feasible and deliver a positive value impact to organisational performance) and Organisational Culture (Data Driven Mindset and Literacy).

Higher calls for achieving *HIGHER* impact by focusing on the business outcomes of BA rather than inputs such as technology deployments or building BA solutions. Faster is about delivering *FASTER* time to insights so that business decision makers have a data solution in their hands as soon as possible after an opportunity or business problem is identified. There are two elements to growing *STRONGER* together, namely strengthening cross functional collaboration between data and business teams and also strengthening the data foundations of data availability and data quality, along with robust technology platforms.

The strategy is brought to life through a series of initiatives linked to the BAR. For example, under the People & Process pillar an initiative was to establish above-OpCo capabilities in the form of Regional Data Management and Analytics Hubs to provide OpCos with the specialised D&A skills such as Data Engineers, Data Scientists, etc. The Data Management Hub (located in Egypt) and the Analytics Hub (located in South Africa) were both established in the second half of 2021. Other examples of initiatives include implementing a Governance process for

analytics use cases under the Actionable Business Value pillar and deploying a cloud data platform under the Solid Foundations pillar.

In 2023, two years after the launch of the AME D&A Strategy, significant progress had been made. AME had taken a leading role as the first of the four HEINEKEN regions to appoint a Head of D&A, develop a D&A Strategy, build Regional D&A Hubs, etc, and was outperforming in terms of realising value from data. In 2022, despite accounting for 13% of global revenue, the AME region delivered 60% of global value from analytics use cases. However, by mid-2023 the lead author as Head of D&A had formed the view that some elements of the strategy were at that time not being realised as well as others. This was in contravention of the Holistic principle of the BAR which states that all elements of the BAR are essential for success and need to be developed holistically to prevent a gap emerging between the organisations ability to produce and consume analytics. Areas of concern included the speed of deployment of analytics use cases was not accelerating as anticipated, value delivery while continuing to grow was starting to drift behind the ambitious targets, and embedding analytics solutions in long established business processes was proving challenging. To assess if the strategy was as well understood by the D&A team (responsible for the strategy implementation) as had been perceived by the Head of D&A (lead author), it was decided to engage the teams by conducting a Data Value Map (DVM) analysis as outlined in the following sections. The outputs would then be used to inform future actions such as amending / recommunicating the strategy or course corrections in the implementation.

Methodology

This section presents the Data Value Map (DVM) and the use of the DVM discursive template as part of a three-stage research design.

Data Value Map

The mindset to transform information into a “*critical business asset*” (Laney, 2018, p. 10) does not always dominate the ways business manage their information assets. Therefore, weaponising information as opposed to just using it (c.f. Laney, 2018) can be a significant business challenge. In fact, Laney (2018, p. 12) comments that “*myths create cognitive roadblocks that hinder business leaders from realising anything near the full promise of information*”. It is necessary therefore to be able to see through the “*cerebral fog of these myths*” (Laney, 2018, p. 12) and take advantage of ways of seeing what we say (a concept popularised by Karl Weick in his work on organisational sense-making). Once such device that offers this visibility is the Data Value Map (DVM).

The Data Value Map (see Figure 10) is a structured discursive template (c.f. Sammon & Nagle, 2017) that positions the key components of the often referred to *information supply chain* (c.f. Laney, 2018) or *information chain*. (c.f. Redman, 2008) The four components of the information supply chain (ISC) are *acquisition*, *integration*, *analysis* and *delivery*. Each of the components serves a specific purpose, where *acquisition* details the gathering of data from business activities; *integration* describes the combining of datasets from numerous sources; *analysis* describes the processing of analytics on subsets of data; and finally, *delivery* focuses on supplying analytical insights in a suitable format. These four components are book ended by two human actors, namely: the *data creator* and the *data user*. The data that flows from the data creator to the data user must be (i) of high quality and (ii) put to use. This demands that a shared understanding of data behaviours and business value exists (between the data creators and the data users) in order to frame the four components of the information supply chain. To do so goes a long way to protecting against the much-bemoaned concept of GIGO (garbage in, garbage out), where the quality of the output is determined by the quality of the input.

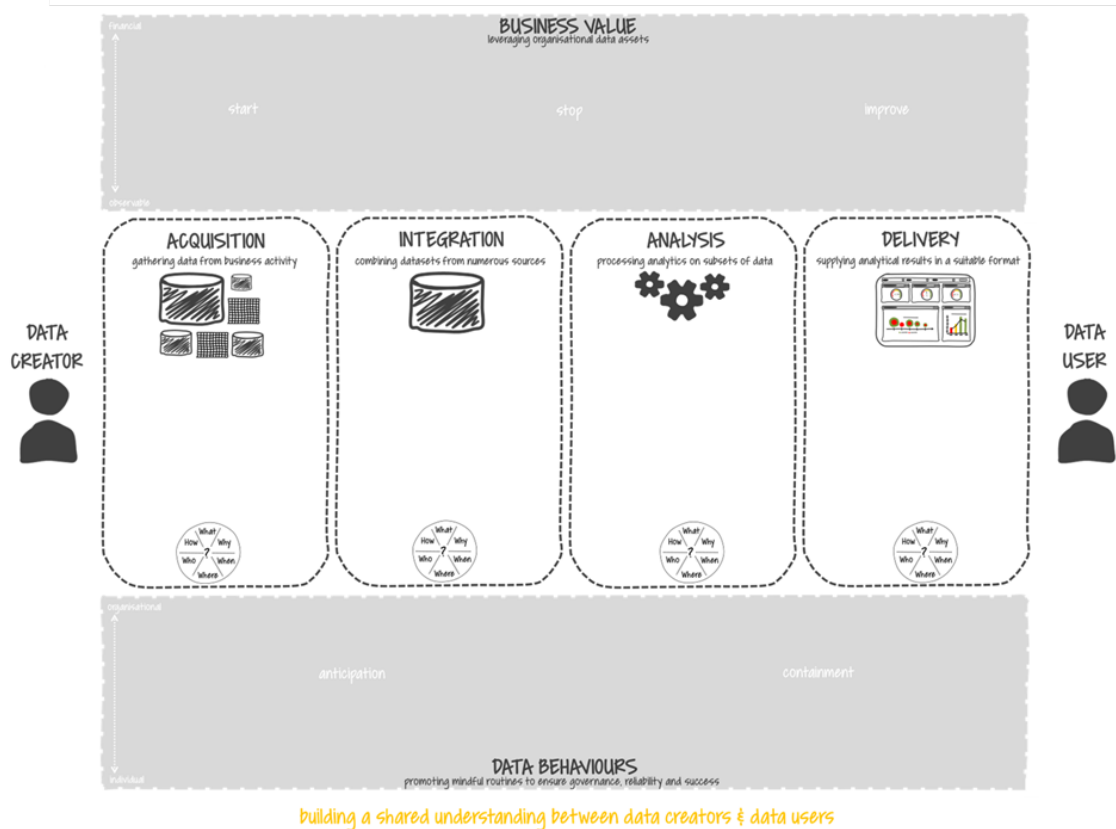


Figure 10: The Data Value Map (DVM) Discursive Template

The Data Value Map (DVM) enables a visual sense-making process of unfold where all too often competing multi-stakeholder conversations are taking place between business and technology. Therefore, through answering a series of simple probing questions along the four components of the ISC, all stakeholders are in a better position to see what they say. The alignment of *people*, *process*, and *technology* with the capability to organise, govern and share data to achieve business ends is fundamental to promoting data-driven conversations using the DVM (c.f. Sammon & Nagle, 2017). To aid these conversations, six very simple questions (*why*, *what*, *when*, *who*, *where* and *how*) ensure all underlying assumptions are at least questioned if not fully examined. Therefore, answers to questions can be placed on the DVM to create an elaborate visual to effectively communicate the sense that stakeholders make of the data. The very act of going through this rigorous process of questioning ensures that every implicit

assumption is questioned, therefore challenging the status quo, in the pursuit of unlocking a value driven data conversation.

The Three-Stage Research Design

Stage One of the research design involved gathering data from ten key informants. These data were gathered using semi-structured interviews. The questions invited the key informants to share their role in the analytics production lifecycle and their sense of ‘what works’/‘does not work’ in the execution of the D&A strategy. Those interviewed across the AME region share their “experiential stories” from various perspectives (local/region/global) and positions (e.g. Data Management Hub, Data Analytics Hub, OpCo) within HEINEKEN (AME region). These key informants were selected not for their “representativeness” alone, but for their “*informedness and ability to communicate*” (Campbell, 1955, p. 339). Therefore, using the informant technique typically means that the researcher gathers data from a person who performs an organisational role and is well informed and well able to speak the language of the researcher.

This approach affords us the opportunity to “*capture the meaning*” from those practitioners “*living the experience*” (leading a D&A initiative in a traditional organisation) and “*theorize about that experience*” (Gioia et al., 2013, p. 17). Being inspired by features of the Gioia Methodology (as a “*systematic inductive approach to concept development*” and assumes that “*the organisational world is socially constructed*” (Gioia et al., 2013, p. 17)), we had an ambition to conceptualise the practitioner voice and to not “*substitute practitioners’ understandings for theory*” (Markus et al., 2021, p. 273). As a result, in our data collection we give “*extraordinary voice to informants*” where we view them as “*knowledgeable agents*”. As illustrated in Figure 11, these stories provide great coverage of the D&A strategy and reveal interesting observations right across the DVM (*acquisition, integration, analysis delivery, business value, and data behaviours*). All interviews took place between February and April 2023 and lasted between 45 and 90 minutes. The interviews were conducted by two

members of the research team (excluding the lead author who is the Head of D&A for the AMEE region and was also interviewed as part of this research stage).

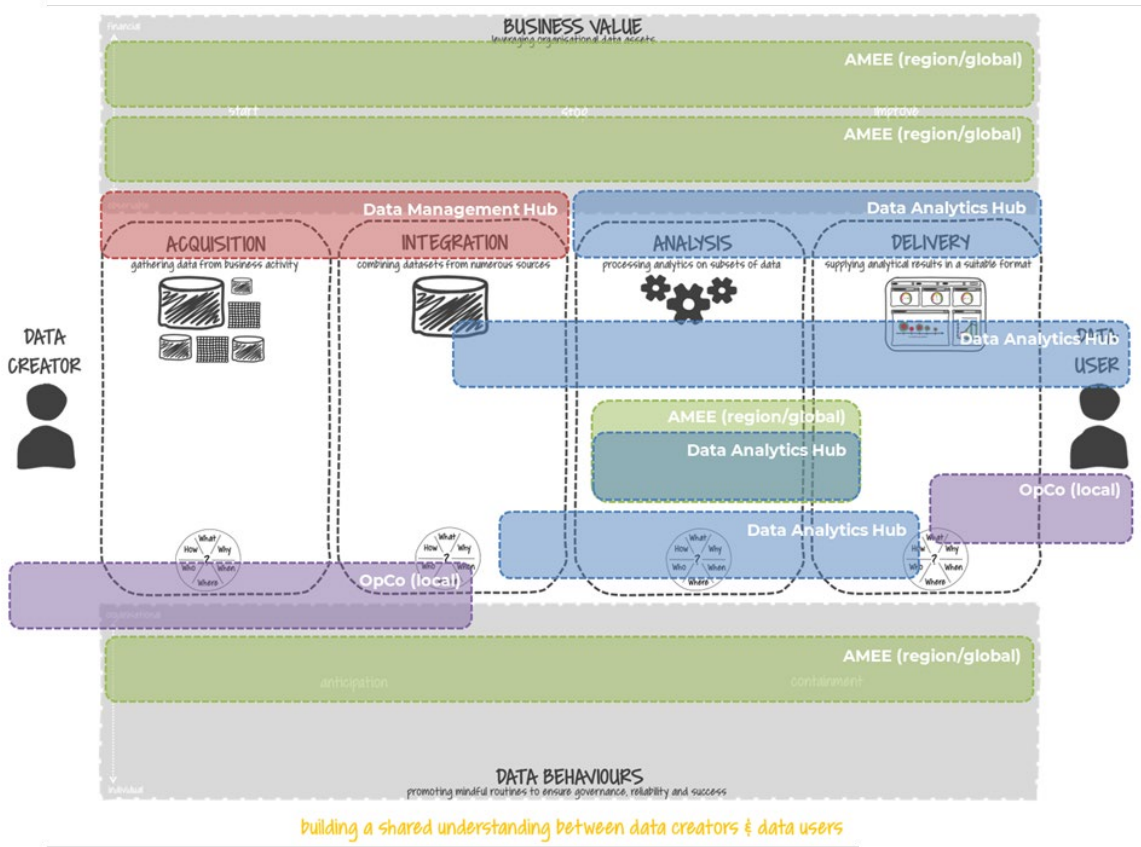


Figure 11: Distribution of Key Informants

Once all interview data was gathered, both team members also coded the data using an inductive open coding approach. Initially, we maintained “*the integrity of 1st order (informant-centric) terms*” when coding the ten interview transcripts during data analysis (Gioia et al., 2013, p. 26). Thereafter, as we progressed in our analysis of the data, we further organise the “*1st-order codes into 2nd-order (theory-centric) themes*” (Gioia et al., 2013, p. 26) using the Data Value Map as an analytical frame. This approach also afforded the opportunity to place an emerging theme (raised by a key informant) on the DVM (placing it where it is most relevant). Therefore, over the course of several rounds of coding, a rich picture of the analysis emerged (see Figure 12). This DVM rich picture showcases eight ‘black boxes’ that emerge as requiring further discussion. These eight DVM

analysis ‘black boxes’ include the following: (i) *ERP System (data quality)*; (ii) *Commerce Systems (data quality)*; (iii) *Data Prime (Azure DB)*; (iv) *Harmonised Data Pipelines*; (v) *AVC Use Cases*; (vi) *Common Business Language*; (vii) *Translators (local, region, global)*; (viii) *POC Driven (faster, stronger, higher)*. This visualization of the eight ‘black boxes’ positioned on the DVM now provided an opportunity to build a shared understanding amongst the D&A team members (which was the focus of Stage Two).

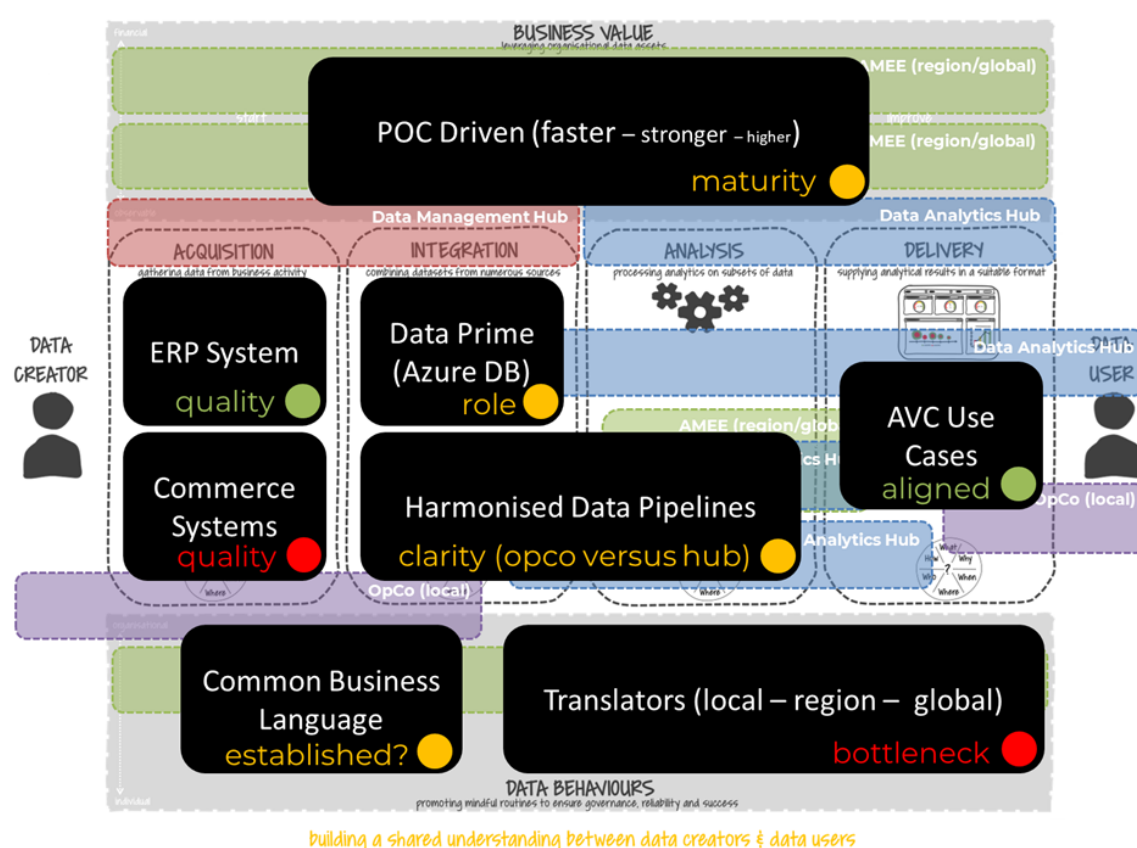


Figure 12: The Eight ‘Black Boxes’ of the DVM Analysis

For Stage Two, the two research team members (excluding the lead author) presented their analysis to the D&A cohort (within the AME region). This presentation took place on June 14th, 2023, and lasted for 90 minutes. This was viewed as a further opportunity to build a shared understanding within the D&A

cohort. As part of this feedback presentation, each of the eight ‘black boxes’ were unpacked and the reason for the RAG (red/amber/green) status was explained. Finally, in Stage Three of the research design, the Head of D&A for the AME region (the lead author) reflected on the learnings from the DVM analysis. Specifically, they focused on the impact of the eight ‘black boxes’ on the execution of the D&A strategy within the AME region.

The outputs of Stage Two and Stage Three are now presented in the next section.

Findings & Discussion

DVM Analysis (unpacking the ‘black boxes’)

This section presents the work associated with Stage Two of the research design.

Data Quality in the ERP System & Commerce Systems

Both these systems contain data of interest to the analytics ambitions within the AME region. However, while key informants suggest that the data in the ERP System was of good quality, it was the data in the Commerce Systems that was of greater value (to analytics), but of lesser quality. There were several reasons for this reality within the region, however, historically, it seems that more effort has been focused on data quality within the ERP system (e.g. where data standards have been well defined over the past decade). It was also revealed that executing the analytics use cases has triggered the surfacing of data quality issues in the Commerce Systems, specifically. Therefore, as part of the presentation, the researchers concluded that the Commerce Systems data are just as important as the ERP System data for strategic success (e.g. data-driven insights to become the best-connected brewer). As a result, they also questioned if a plan was in place to rectify these data quality issues? Data quality was viewed by several key informants as the biggest barrier to speed, therefore, the suggestion is that better data quality will make them faster (as per their D&A strategy).

Data Prime

Data Prime was mentioned by all key informants, however, their descriptions of what it is (and its role) vary considerably, with Data Prime being described as a data warehouse solution, a data lake, a cloud-based system, an ETL process to harmonise data, and so forth. Notwithstanding this, it is revealed throughout the course of the interviews that Data Prime is in fact a programme of work to create a platform (an Azure Database) to ingest data from different sources (e.g. move OpCo data to the cloud) in order to build analytics solutions. This would ensure that the required data is always available (to access) for faster use case deployment. Therefore, the ambition is that all AME region data (required for analytics) will reside on this platform, and one key informant revealed that 75% of data are currently on Data Prime. Therefore, as part of the presentation, the researchers concluded that there is a lot of uncertainty amongst the key informant voices as to (i) what Data Prime actually is, and (ii) its role in delivering analytics use cases (e.g. does it deliver value).

Harmonised Data Pipelines

The Harmonised Data Pipelines (HDP) was mentioned by several key informants and is described as a stepping-stone to the adoption of Data Prime (a global initiative) throughout the AME region. Therefore, it appears as if local OpCo data is loaded onto HDP, which is viewed as an AME region solution, that is architecturally similar to Data Prime. HDP is a solution to a Data Prime ‘bottleneck’ problem, where some analytics use cases demand more data than Data Prime might currently have available. Therefore, as part of the presentation, the researchers concluded that HDP connects integration and analysis (two components on the DVM) where HDP might be more like a ‘data mart’ (region solution) and Data Prime more like a ‘data warehouse’ (global solution). However, there is also a lack of clarity amongst the key informant voices as to the relationship between HDP and Data Prime in delivering analytics use cases (e.g. does it deliver value), and a lack of a shared understanding from a local to region level. As a result, the researchers also questioned if cleaning the “same” data (80% of time) is a never-ending prospect to deliver data-driven insights (20% of

the time) as the best-connected brewer (given the co-existence of HDP and Data Prime)?

Common Business Language

A small number of key informants suggested that while Data Prime can make access to data faster, there is a pressing need for a common business language to make things stronger. One key informant suggests that people speak a different language, even within the same function (e.g. sales) across the region, and sometimes to describe the same things! Therefore, as part of the presentation, the researchers concluded that there is a need for a ‘shared’ common business language to support the delivery of analytics use cases (e.g. to deliver value). As a result, they also questioned if the AME region is structured appropriately to align with the data-driven ambitions? For example, when/where does the transformation of data (from source system to target system take place, and is the global/region/local legacy (processes, systems, data, people) costing more than it should (to align with the strategic data vision: data-driven insights to become the best-connected brewer)?

Translators and AVC (Analytics Value Council) Use Cases

The approach to proposing, evaluating, and prioritising use cases appears very robust (with an obvious alignment to the D&A strategy) within the AME region. In fact, key informants suggest it is an exemplar for other regions. Notwithstanding this, a point of difference did exist as to whether analytics use cases were ‘bottom-up’ versus ‘top-down’. The ongoing desire to deliver use cases faster also exists, and several reasons are provided as ‘bottlenecks’ to speed, from the quality of the data to the availability of the data, on Data Prime. However, a further reason is highlighted by some key informants and centres on a lack of ‘Analytics Translators’ within the region. As commented by a key informant, the translator (the region level – Analytics Hub) is viewed as the bridge between local (the daily reality – the practice) and global (the strategic ambition – the theory). A further appreciation of the role of the ‘Analytics Translators’ is provided by another key informant who suggests that they translate from local (OpCo) to region (Hub) and it is this relationship (between local and region) that generates

value, in essence, relationship building makes things faster! Therefore, being “close to the action” and “building domain knowledge” enables “assumptions about the reality to be challenged” and a “better sense of the data to be made”. However, other key informants suggest that communication around the data landscape is the biggest challenge and clarifying the shape of this landscape is enabled by the translators, although there is a shortage of these resources. Therefore, the current small number of ‘Analytics Translators’ is a bottleneck to faster and higher, as they are the analytics use case owners. Therefore, as part of the presentation, the researchers concluded that a lack of ‘Analytics Translators’ is the biggest barrier to speed (e.g. data-driven insights to become the best-connected brewer). As a result, they also questioned if a plan was in place to rectify this issue, suggesting that more translators will make the region faster (as per their D&A strategy).

POC Driven

The execution of the D&A strategy was conceptualised by several key informants as a journey. For example, the impact of a “history of a decentralised data landscape” is being exposed as part of the execution of the D&A strategy, and in many instances “the analytics use cases triggered the surfacing of data quality issues” (in Commerce Systems specifically). Therefore, as part of the presentation, the researchers concluded that the maturity of what is being done is aligned with a *Proof-of-Concept* approach. As a result, they also questioned the plan to move from shorter-term “POC driven” practices to longer-term delivery of sustainable value (as the best-connected brewer) for stakeholders? In essence, the ‘value to feasibility’ trade-off (as regards the criteria used to accept/reject a use case) needs to be appreciated in the context of a ‘path to value’ approach for the next step in the journey of the D&A strategy execution.

Head of D&A (Practitioner) Reflection on the eight ‘black boxes’

This section presents the work associated with Stage Three of the research design. Despite having commissioned the DVM analysis, the Head of D&A for the AME region (lead author) was not provided with the outcomes in advance of the results sharing workshop (delivered by the two-member research team in June).

This was intentional to ensure that the results shared with the wider D&A team represented the views of the teams implementing the D&A strategy as objectively captured by the external researchers, and unbiased by the views of the Head of D&A. Following the workshop, the identified key concepts (eight ‘black boxes’) along with the status of each was reflected upon by the Head of D&A (lead author) as outlined in Figure 13.

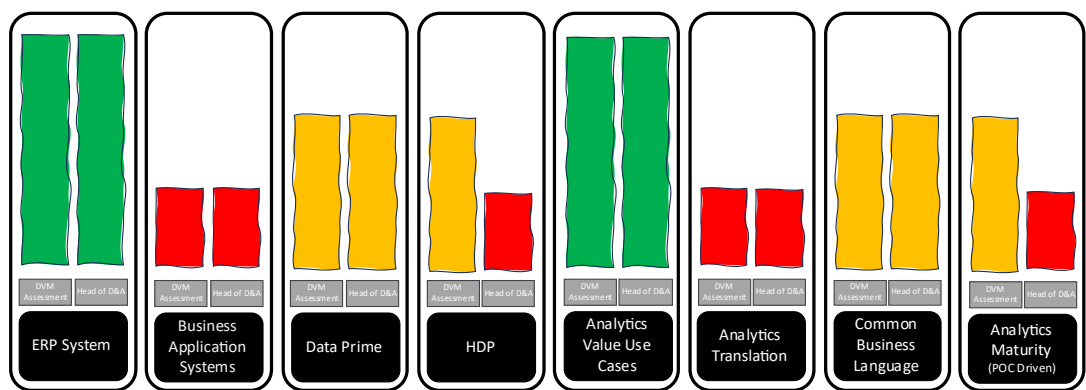


Figure 13: Comparing the Eight ‘Black Boxes’ from the DVM Analysis

ERP System

Head of D&A RAG: Green

Most of the data currently used for BA is data from the ERP systems of the OpCos and is predominately transactional data such as sales invoices. The acquisition of data from ERP systems was assessed as Green by the DVM analysis and as Head of D&A, I would concur with the finding of the research team. In general, this data is of relatively good quality and can be relied upon with confidence to make decisions. There are several reasons for this, firstly the ERP systems are used to enable the business to operate, so any errors are highlighted in the course of daily operations. For example, a customer will not pay an invoice for goods which were not received, so if there are errors, they are quickly corrected. Financial reporting is also based on ERP data so historically there have been

robust controls put in place to ensure the accuracy for business control purposes. Furthermore, in recent years a programme was completed in which all the small and medium OpCos in the region standardised on a common ERP which has led to greater standards, consistency across OpCos and improved processes, with a data quality score in excess of 99%. Notwithstanding that there are certainly issues of data quality, particularly in some less mature OpCos, the standard of data quality is generally high.

Business Application Systems (Commerce Systems)

Head of D&A RAG: Red

As HEINEKEN continues to digitise its business operations, several business application systems have been introduced in recent years. As we focus on digitising our route to consumer, many of these applications are in the commerce area such as e-commerce B2B systems, call centre systems, distributor systems, but also include other areas such as warehouse management systems. In contrast to ERP data, the quality of data acquired from Business Application systems was rated as Red by the research team. As Head of D&A this was not unexpected as business application data quality is recognised as a challenge impeding business analytics and there are initiatives in place to address. It was the case in the past that some of these applications were deployed on a piecemeal basis in response to operational requirements and priorities in particular OpCos. Individually, these business applications were successfully implemented and met the needs they were initially designed to meet. For example, the distributor management system works as designed and allows distributors to place orders with HEINEKEN, manage their own stocks, plan their routing, report their sales, and so on. However, when it comes to using this data for data driven decision making, challenges soon occur. Different distributors utilise the application in different ways with some fully utilising and others continuing to manage their business on paper and just using the system to place orders with HEINEKEN. Another example is distributors might set up a new customer on the system even though the same customer might be already recorded in the HEINEKEN ERP and even the distributor system as other

distributors might also be delivering to the same customer. These non-ERP applications contain a rich source of data which is essential for impactful analytics beyond traditional reporting and BI, so addressing the data quality and consistency issues across the business applications has been prioritised, with several initiatives across technology, process re-engineering, quality measurement, etc. initiated in the past 18 months.

Data Prime

Head of D&A RAG: Amber

Data Prime is a programme with several components including deploying an Azure Cloud database along with a suite of data management tools for data governance, data lineage and data quality. It also includes some basic training on the tools. In the area of data integration, the Data Prime initiative is assessed by the research team as amber, which is an assessment which I as the Head of D&A concur with, but for different reasons. The perception of Data Prime in some areas of the business was that it would deliver data driven decision making, when it actually only delivers technology solutions which enable business analytics. There are many more elements required in a Business Analytics capability beyond just the technology. Therefore, from an OpCo perspective, stakeholders struggle to see the value of Data Prime and it is not surprising to hear it described as a solution looking for a problem. The approach in AME therefore was changed, with Data Prime in AME set up to not only deliver the technology platform and the data from ERP, but also data from the top 3 Commerce Business Application Systems along with an initial analytics use case. The project approach was also adjusted to ensure the programme was completed five times faster than the next fastest region. From the perspective of the Head of D&A, the status of Data Prime has improved from Red to Amber as it has been successfully completed and is delivering value by enabling faster deployment of use cases in line with the regional Higher Faster Stronger D&A Strategy. It is not Green, because while the data is more accessible, it remains unharmonized so is still not fully analytics ready.

Harmonised Data Pipelines

Head of D&A RAG: Red

As previously mentioned, Data Prime is delivering accessibility to data from the key business applications across HEINEKEN. However, the data remains unharmonized so is not ready to be used in business analytics use cases. To resolve this challenge, an initiative called Harmonised Data Pipelines has been established to build pipelines which harmonise the data required for business analytics use cases. While the data is sourced from the Data Prime cloud, it is technically possible for HDP to integrate data from applications which are not ingested to Data Prime. Given that the programme is relatively new and there have been many changes in the six months prior to the research interviews, it is understandable that the research team would rate it as Amber. However, as the Head of D&A, I rate the current status as Red, due to the slow progress to date, the challenges facing the ambitious aspirations of the programme due to the complicated data landscape across the region, and the insufficient level of the resources currently allocated by the HDP Team to deliver on the aspirations. While the challenges are recognised, they are being addressed by the Global Teams responsible for HDP, so the expectation is that status will very quickly improve.

Analytics Value Use Cases & AVC

Head of D&A RAG: Green

The Higher element of the AME D&A Strategy calls for a focus on impact over inputs. Strengthening the governance of analytics use cases has been one of the most impactful and transformative strategic initiatives undertaken to date. The DVM research team assessed this element as Green and as Head of D&A I concur. Prior to establishing the Analytics Value Council (AVC), the Business Analytics teams were at full capacity delivering solutions, but the utilisation and value realised was mixed. The AVC brings together the senior leaders from the Data & Analytics and the business teams to jointly prioritise use cases, track

progress and remove any blockers which are escalated by the teams to the AVC. Use cases are prioritised based on the value which they are likely to create, the technical feasibility given the available data, quality of the data, technology, and the skillset of the teams and the actionability (do the business decision makers have the capability to implement the solution). This has led to cross-functional alignment, ensured the prioritisation of business analytics solutions which are delivering a significant impact on business performance and provided clarity to the BA teams on the value and purpose of their contributions. The implementation of robust and transparent governance for BA has been recognised across the business as a significant driver of the BA success to date.

Analytics Translators

Head of D&A RAG: Red

The role of the Analytics Translators, or Analytics Product Managers is recognised as possibly the most crucial role in the Analytics Hub, particularly as the Analytics Hub is shifting from a provider of technical analytics solutions to a BA centre of excellence focused on impacting business performance by leveraging the power of data. As Head of D&A, I assess the status of this element as Red which is the same as the assessment of the DVM Research. The existing Translator resource is performing very well in terms of partnering with business to identify opportunities, refine business questions and partnering with the business and technical teams through the stages of data acquisition, integration, analysis, and delivery. The scope of the role is end-to-end and is playing a leading role in ensuring BA is actioned with value realised and measured. However, the challenge is that there is not enough resource, and this constraint has created a bottleneck and is impacting on the delivery of faster time to insight as called for by the D&A Strategy. Therefore, while there is alignment that the status of this element is Red, additional resource is currently being recruited so this status is expected to be short term. Furthermore, as currently structured, most of the translation is conducted by the Analytics Portfolio Managers (Previously known as Analytics Translators) which are attached to the Regional Analytics Hub or the Global Analytics Teams, which are developing the BA use

cases. The Regional D&A Strategy calls for this translation activity to be located closer to the business decision makers, so at the OpCo level there is a requirement to further build this capability.

Common Business Language

Head of D&A RAG: Amber

The Common Business Language (CBL) is a collection of data related standards, terms and rules described in clear language that everyone across the organisation can understand. The CBL is required in order to deliver a solid data foundation as per the D&A Strategy, as it allows people across the organisation to better communicate and collaborate, drives consistency in interpretations, allows shared understanding of data and eliminates disconnected static views of data. The DVM Assessment rated this element as Amber, primarily due to a lack of clarity around the status of the CBL and as Head of D&A, this is a fair assessment. The creation of the Common Business Language is recognised as a priority and is being developed by the global data management team. Good progress has been made to date with the data governance and cataloguing tool (Collibra) now delivered as part of the Data Prime programme, but it is not yet being widely utilised beyond the Data Management Teams. Furthermore, work continues to define the data standards, business terms and business rules, so while these are in place and available for some domains, the CBL is not yet fully developed.

Analytics Maturity Stage - POC Driven (Realising D&A Strategy Faster, Stronger, Higher)

Head of D&A RAG: Red

The D&A Strategy is to deliver higher impact through scalable value enhancing use cases which are actioned by decision makers. This calls for analytics solutions to be embedded in the business processes. The DVM Assessment rated this element as Amber, but as Head of D&A, this element would currently be defined as Red. It is the case that some analytics use cases have been scaled across multiple OpCos and are embedded in decision making with proven value. However, these use cases are in the minority to date and are concentrated in just

one domain. A significant number of use cases still struggle to move beyond the POC or pilot phase, even when the POCs are successful and deliver value. The reasons are many and varied and range from lack of consistent data quality and standards to a lack of capability and / or engagement amongst the business decision maker community. Moving the maturity beyond the current status is not a quick fix and requires a holistic approach with capability building across the entire D&A Ecosystem including data, technology, people competencies, ways of working, overall organisational culture and capability. It is for this reason, i.e., the complexity of the solution requiring advances across the entire DVM, that this element is currently rated red by the Head of D&A.



Picture 6: Barley being grown in Rwanda as part of HEINEKEN's local sourcing initiative to support local farmers across Africa

Conclusions: So What?

The DVM analysis outlined in this paper set out with the objective of providing HEINEKEN AME with an assessment of the D&A strategy-execution gap, both in terms of how well the D&A strategy had landed with the people tasked with implementation, and in identifying enablers and inhibitors. It was expected that this DVM analysis would inform any course-corrections to ensure a successful D&A strategy execution. The strategy was found to be well understood by the teams, thereby validating the strategy communication and alignment. The DVM

analysis also identified, from the perspective of those implementing the strategy, the areas requiring attention and 'course correction' (see Table 13). Overall, the approach taken (undertaking a DVM analysis) also provided a framework to structure observations by mapping the key areas (black boxes) to the DVM components.

The biggest shifts in the focus areas of the AME D&A Strategy following the DVM Analysis are in terms of breaking from the POC Driven approach and building capability at the end user (decision makers in OpCos) level. The observation of the lead author is that while a good D&A strategy was developed, the organisation moved too quickly to over focusing on developing and deploying analytics use cases and did not focus enough on building the organisational wide capability to embed analytics in a sustainable way. It was described as starting to build a house with good plans but then trying to move into and live in the house before construction was completed.

The three primary criteria for prioritising use cases had been Value (the impact of the use case on business revenue growth or cost savings), Scalability (potential to deploy use case across multiple OpCos), Actionability (end users ability to do something different resulting from the use case). Delivering Scalability in practice proved to be more difficult to achieve than had been envisioned in the strategy. Differing data foundations and levels of end user capability meant that it was not easy to deploy use cases developed in one OpCo across multiple OpCos. While a significant business transformation programme is in progress to simplify and standardise ERP, business applications and processes across all HEINEKEN OpCos, which will enable scalability in analytics use cases, this has not yet been completed. In the meantime, following the DVM analysis, the criteria for prioritising use cases have been amended with feasibility replacing scalability in the top 3 criteria. Feasibility includes assessing how feasible it is for the OpCo to implement and embed the analytics solution in the everyday business process rather than as a one-off ad hoc piece of analysis.

Black Box	DVM Component	Strategy-Execution Reality (So What?)	Inhibitor / Enabler	Action Plan (What Now?)
ERP System (data quality)	Acquisition	Clarity and alignment on role of ERP with good level of data quality enabling analytics	Enabler	Maintain
Commerce Systems (data quality)	Acquisition	Recognised pain-point impeding strategy implementation	Inhibitor	Continued prioritisation of initiatives to address data quality
Data Prime (Azure DB)	Integration	Lack of clarity on role of Data Prime and the value delivered	Inhibitor	Reassess strategic position of Data Prime and role in overall D&A Strategy
Harmonised Data Pipelines	Integration & Analysis	Lack of clarity on role of HDP / difference to Data Prime and challenged with HDP delivery	Inhibitor	Re-establish alignment on role of HDP, and plan to accelerate development
AVC Use Cases	Delivery	Recognition that analytics value governance is working well	Enabler	Maintain
Common Business Language	Data Behaviours	Recognised that implementation of Common Business Language lagging other elements of D&A Strategy	Inhibitor	Continue to accelerate plans to implement
Translators (local, region, global)	Data Behaviours	Availability of resource recognised pain-point impeding strategy implementation	Inhibitor	Continue to accelerate plans to put resources in place at Region and OpCo level
POC Driven	Business Value	Too much focus in demonstrating feasibility of small-scale analytics use cases	Inhibitor	Shift in approach to selecting use cases with increased emphasis on impact, path to value and actionability.

Table 13: Summary of 'Black Boxes' and resultant actions

In addition to amending the criteria for use case selection, the resources of the AME D&A team were also reoriented to accelerating capability building at the OpCo level. The profile of D&A roles in the OpCos was changed to move more towards transformation type activities such as change management and analytics product management while further consolidating technical roles such as Data Scientists in the Regional Hub. Other initiatives included executive upskilling programmes, OpCo focused D&A playbooks, training courses for technical and non-technical employees, maturity assessments and engagement initiatives such as newsletters and competitions.

The DVM outputs along with the resultant shifts in the D&A strategy were reviewed by the senior leadership team of the Region at a strategy off-site during which it was noted that the DVM Analysis was a useful exercise and provided reassurance that the course-corrections being implemented in the D&A strategy were addressing the real implementation pain points to becoming a data driven organisation. In the second half of the year, progress with the implementation of the strategy was observed by the Head of D&A (lead author) to have picked up again with a renewed vigour and enthusiasm from the implementation teams playing a role.

The objective of this research was to determine if the D&A strategy was landing with the people responsible for implementing it and how implementable it was in its current format. On December 19th, 2023, the Digital & Technology Director for HEINEKEN in the AME Region addressed the year end Global Townhall being broadcast to employees across HEINEKEN. She proudly exclaimed that for the second year running the AME Region (smallest of the four regions) had successfully generated the most value from Data & Analytics, had been the first to complete Data Prime, (the company wide programme to implement a cloud based analytics platform), and the success had been achieved by realizing the holistic Business Analytics strategy focused on achieving Higher business impact, Faster time to insight and growing Stronger as a data driven collaborative organisation with solid data and technology foundations. This level of success could only have been achieved by ensuring that there was no strategy-execution gap in the bringing to life of the D&A strategy.

References

References are consolidated in References section.

Chapter 5 BRIDGING THE ANALYTICS STRATEGY-EXECUTION GAP: AN ANALYTICS LEADER’S STORY

Paper Summary

Paper Summary Chapter 5 – Business Analytics Leader Bridging the Analytics Strategy-Execution Gap: An Analytics Leader’s Story			
Peer Review	Analysis Method	Key Data	Key Contribution
Information Systems Journal – Practitioner Paper under review	Abductive “human-in-the-loop” analysis including open coding of Analytics Leader’s stories and analysis through leadership behaviour and leader archetypes frameworks	Autobiographical phenomenological accounts of Analytics Leader	Four thematic leadership taglines to better conceptualise the remit of an Analytics Leader, looking to bridge the Analytics strategy-execution gap within a traditional organisation

Abstract

Exploring the challenge of the analytics strategy-execution gap for traditional organisations, this study analyses first person autobiographical phenomenological accounts of an effective analytics leader in HEINEKEN (the world’s most international brewer) over a ten-year period. The aim is to better understand how to bridge the gap and provide greater clarity on the role of the Analytics Leader, which has been characterised by high turnover, short tenures, and confusion. Our research is designed around a three-stage abductive “human-in-the-loop” (HITL) grounded theorising approach. Each stage of our approach aligns closely with open, axial and selective coding, taking us from the messy reality of unstructured text (Analytics Leader’s stories), through a structured theoretical informed matrix, and onto a model of Analytics Leadership. The six-month (January to June 2024) abductive HITL grounded

theorising approach afforded the research team the opportunity to move between data (12 stories of the Analytics Leader) and theory (Leadership Behaviours from Yukl (2002) and Leader Archetypes from Korherr et al. (2022)) in a cyclical fashion. Our research concludes with four categories of Analytics Leadership themes that better conceptualise the remit of an Analytics Leader, looking to bridge the analytics strategy-execution gap within a traditional organisation.

Keywords: Analytics Leader, Leadership Behaviour, Human-in-the-Loop, Grounded Theorising, Strategy-Execution Gap.

The Analytics ‘Strategy-Execution Gap’ Problem

Business Analytics has long been seen as a catalyst for change and a platform for large traditional organisations to embark on transformation initiatives (Canon Moreno & Van Maanen, 2017), resulting in the growing interest in the domain amongst the researcher and practitioner communities (c.f. Delen & Ram, 2018; Hindle et al., 2020; Mikalef et al., 2020). However, there remains much work to do, as there is a widening gap between organisations gaining value from data and those struggling to execute data-driven transformations in practice (Davenport & Redman, 2020; Joshi et al., 2021; Klee et al., 2021; Smith et al., 2019). For example, only 40% of consumer goods organisations are achieving a positive return on investment in analytics (Halbardier et al., 2020) and less than 25% of respondents to the New Vantage Partners (2023) Data and AI Executive Survey consider their organisations to have already become data-driven.

Traditional organisations, which were established in the pre-digital era and whose success has been achieved through non-digital business models, organisational structures and culture, face additional challenges, as their data-driven transformations can be impeded by those traditional structures and processes which had worked for them in the past (Gust et al., 2017). Given the focus on BA, it is no surprise that senior executives are increasingly advocating BA strategies intended to transform their organisations to become data-driven (Delen & Ram, 2018; LaValle et al., 2011a). However, the realisation of these data transformations is hampered by the analytics strategy-execution gap, as exemplified through the continuous struggles encountered

by BA teams trying to implement the high-level strategies devised at board level (Kenny, 2019; Wiita & Leonard, 2017).

The strategy-execution gap is a problem facing most organisations engaged in transformation efforts and is not easily overcome (Galpin, 2023; Wiita & Leonard, 2017). There can be many factors contributing to the existence of the strategy-execution gap such as a misalignment between the strategy and the organisations business priorities, existing capabilities and culture (Joshi et al., 2021; Leinwand et al., 2015), ineffective communication of the strategy (Bonchek, 2017; Joshi et al., 2021), lack of agility to adapt as the organisation learns throughout the implementation process (Mankins, 2017; Sull, 2007), resistance to change resulting from a lack of 'buy in' or ownership of the strategy from the people at the front lines tasked with implementing it (Bonchek, 2017; Kenny, 2019), along with insufficient monitoring and tracking of the strategy execution (Bonchek, 2017). Furthermore, research on successful analytics strategy implementation has tended to focus on areas such as strategic frameworks, organisational resources (including data and technology), or people capabilities, with limited coverage of the role of analytics leaders (Tabesh et al., 2019).

Exploring the Problem from an Analytics Leader Perspective

Looking at the analytics strategy-execution gap through the eyes of analytics leaders provides a critical insight. This is relevant as research has noted that analytics leaders are tasked with executing the analytics strategies, through driving the analytics initiatives and guiding the rest of the organisation (Harris & Craig, 2012) and are a key component in the success of data-driven transformations and building an organisation's analytics capability (Davenport & Harris, 2017; Someh et al., 2019). Their critical importance to analytics strategy execution is also highlighted by analytics leaders themselves as outlined in a survey of 566 analytics leaders, which noted their key tasks as defining and implementing analytics strategies, analytics strategy oversight, creating and implementing analytics governance, and managing data-driven cultural change (Gartner, 2023)

Looking at an analytics leader impact from a value perspective, in a survey of 68 firms that had an analytics leader in the form of a Chief Data Officer (CDO), it was found that

firms with a CDO have superior financial performance than their peers who do not (Xu et al., 2016). This is further supported by research that found that firms with CDO's have higher profit ratios than those that do not (Nie et al., 2019). However, analytics leaders also face challenges. In 2022, less than half of those in the role reported that their team is effective in providing value to their organisation (Gartner, 2023). General challenges such as the difficulty of change, balancing strategic design with political savviness and cultural awareness have also been highlighted by those in the role (Canon Moreno & Van Maanen, 2017). More concerning is a recognition that analytics leader tenures are short, and turnover is high, indicating inherent problems in how organisations have defined and focused the responsibilities of the job with resulting confusion (Davenport et al., 2021). This a significant challenge, especially when there has been increasing investment in analytics functions, which may suggest an underlying confidence in Analytics Leaders, but nonetheless comes with increased demands and pressure (Gartner, 2023).

This has led to an increasing interest in leaders of successful data-driven organisations to clarify the role and make the attainment of being data-driven more feasible (Davenport et al., 2021). Therefore, to gain a better understanding of how to bridge the analytics strategy-execution gap, this research analyses a series of stories from an analytics leader (lead author) throughout their ten-year journey of transforming a large traditional organisation (HEINEKEN) towards becoming a data-driven organisation. From the analysis, a model of four analytics leadership behavioural characteristics emerge to conceptualise the role of an analytics leader and provide a reference point for other analytics leaders facing the analytics strategy-execution gap in a traditional organisation.

The remainder of this paper is structured as follows. In the next section we present the analytics leader's story context. This is followed by presenting our approach to story analysis (the mechanics). Thereafter, we present the outcome of our analysis (the meaning). Finally, we present our insights for the four thematic areas emerging from our analysis. We conclude with an analytics leadership model and a direction of travel for practitioner reflection.

The Analytics Leader's Story Context

HEINEKEN's strategic ambition is to become "*the best-connected brewer*", for customers and consumers living in the digital age. For a traditional organisation¹, this is an ambitious strategy that involves digitally transforming the business and modernizing the technology landscape at the same time. Central to this strategy and resulting digital transformation is a significant increase in analytics capabilities to "*make data part of our [HEINEKEN's] DNA and create data-driven insights to create value*".

The lead author, Head of Data and Analytics for the Africa Middle East (AME) Region within HEINEKEN², has played a significant role in supporting this transformation by designing and implementing a successful analytics strategy. While the AME Region is the smallest of HEINEKEN's four regions by revenue, it has delivered the highest value from analytics for the last two years running. The analytics strategy, which is focused on achieving *HIGHER* (business impact), *FASTER* (time to insight), and *STRONGER* (data and technology foundations), is referred to as the BAR (Business Analytics Recipe), began with early-stage formulation in a national HEINEKEN subsidiary/OpCo, before subsequently going through several stages of refinement to the present-day application in a number of HEINEKEN global regions.

Stories as Data

This practitioner paper embraces the use of "*first person autobiographical phenomenological accounts*" (from here out referred to as *accounts*) where the lead author uses "*their own experiences to examine the quality and essences*" (Finlay, 2012, p. 1) of their efforts to bridge the analytics strategy-execution gap within a traditional

¹ HEINEKEN was established in Amsterdam in 1864 and now has a portfolio of more than 300 international, regional, local and specialty beers and ciders which are sold in over 190 countries. With over 90,000 employees, HEINEKEN operates a decentralized OpCo (Operating Company) centric model with local OpCos in the markets where it operates. It has local production facilities such as breweries, malteries, cider plants and other production facilities in more than 70 countries.

² The lead author of this paper is the Head of Data & Analytics for the Africa & Middle East (AME) Region within HEINEKEN. The AME Region is made up of 15 OpCos with operations in 18 countries across AME. In 2022, with revenue of over €4bn and sales of almost 40mhl (million hectoliters) representing 15% of HEINEKEN total volumes, the AME Region is the smallest of the four HEINEKEN Regions (HEINEKEN, 2023)

organisation (the phenomenon). The aim of such accounts is to provide “*rich, compelling thought-provoking descriptions of lived experiences*” (Finlay, 2012, p. 2). These accounts (a dozen stories from the analytics leader – see Table 14 for story title and story motivation) were initially written by the lead author for themselves as part of helping to make sense of their experiences leading the implementation of an analytics strategy. The complete text for each story is also available in Appendix A. Thereafter, the two other members of the research team had the benefit of reading and analysing such structured accounts. As highlighted by Finlay (2012, p. 2) “*the subjective reality of the lived experiences can, through the writing, be brought closer – both to the writer and to others through engendered empathy*”.

In this research, we use a combination of ‘*reflective writing*’ and ‘*collaborative reflection*’ (Olmos-Vega et al., 2022, p. 5). The ongoing documenting and analysis of the lead author’s personal experiences as an analytics leader (over the ten-year period from 2013 to 2022) is a very rich source of field data. According to Finlay (2012, p. 7) “*such first-person accounts thereby constitute valuable qualitative evidence, whether this is as ‘data’ or as ‘findings’ in themselves*”. More specifically, since 2016, the lead author has also conducted a series of ‘*self-interviews*’ (Olmos-Vega et al., 2022, p. 6), where the transcripts from these self-interviews (affectionately referred to as “*The Big Monkey*”) are analysed by the research team on an ongoing basis. In fact, the ‘*collaborative reflection*’ is primarily based on this on-going analysis of the lead author accounts.

Unlike the lead author, the two research team members are not linked to HEINEKEN and thereby offer an independent, outside-in perspective on the stories. This ongoing analysis by the research team enables a constant comparison of interpretations of the lead author’s experiences throughout their time as an analytics leader at HEINEKEN. Throughout this ongoing analysis, the lead author is questioned about their story, along with the assumptions and decisions made in HEINEKEN (or in the telling of the HEINEKEN story). This approach helps the lead author to uncover their “*blind spots*” and “*to see what you cannot see*” (Olmos-Vega et al., 2022, p. 5). However, these accounts also offer the two research team members “*a way to get ‘up close and personal’ with specific experiences*”, to better understand and empathise with what the

lead author (as an analytics leader) may be going through. Therefore, the accounts also challenge the two research team members “*blind-spots and taken-for-granted assumptions*” (Finlay, 2012, p. 7).

While we appreciate the perceived fragilities of such data (first person autobiographical phenomenological accounts), we also appreciate that (like in the applied field of psychology) “*enquiry into story as data*” through personal reflection “*offers another means by which to close the purported gap between practice and research*” (McIlveen, 2008, p. 2). Therefore, we argue that these curated experiences of the analytics leader are a proxy for other traditional organisation practitioners currently in the analytics trenches. This approach affords us the opportunity to ‘*capture the meaning*’ from this practitioner ‘*living the experience*’ (leading an analytics initiative in a traditional organisation and bridging the analytics strategy-execution gap) and ‘*theorize about that experience*’ for the benefit of others (Gioia et al., 2013, p. 17).

In the next section we present our three-stage abductive “human-in-the-loop” (HITL) grounded theorising approach.

#	Story Title	The Motivation for Telling this Story is...
S1	Raising the Heineken Profile	it illustrates one of the key shifts (engaging externally) that was required to raise the profile of HEINEKEN to successfully transform to become data-driven. The approach was not common in HEINEKEN at that time, so it called for leadership to do something which peers in other functions across the organisation were not doing. The initiative proved to be successful and impactful, in attracting the right talent to the organisation to execute the BA strategy, developed the culture and mindset of the BA front line teams by exposing them to latest BA developments and thinking while also facilitating the evolution of the BA strategy based on learning from other external organisations.
S2	Show me the Money	it demonstrates how the analytics strategy was brought to life and forced a change in thinking an engagement amongst not only stakeholders in other functions but also the analytics Team. The BA strategy had called for a focus on prioritising value. By forcing stakeholders to put a value on their analytics requests and commit their own budget meant value prioritisation was realised and not just a strategic ambition while day to day operations continued on as usual. The analytics team engagement with the strategy execution also increased as they could observe that they were supported in the strategy execution and that it was not another case of needing to implement the latest strategy on top of their existing day jobs.
S3	Getting AME Back on Track	it highlights the importance of continuous monitoring of performance and the responsibility of analytics leaders to take corrective action to ensure achievement of KPIs. Leadership is required to ensure delivery and not just setting the strategic direction at the outset. Prior to the episode described in this story the analytics

#	Story Title	The Motivation for Telling this Story is...
		Team had been aware of the HIGHER element of the analytics strategy but apparently the message hadn't fully landed but having experienced the shift they are now executing the strategy much more vigorously day to day.
S4	Trade Census F**k Up	it illustrates many aspects of the realities of executing an analytics transformation and the role of leadership in ensuring a successful outcome. Things will inevitably go wrong, but we are often reluctant to share the learnings from those experiences. Analytics strategy execution is realised by people and this story covers team dynamics, challenges faced by people when things go wrong and how those failures can be approached in a positive way which reinforces business confidence in analytics and ultimately moves the organisation closer to analytics strategy realisation.
S5	Data Tribe	in order to achieve strategy execution across the organisation and not just in pockets, it is necessary to ensure that the teams and stakeholders across the organisation understand the strategy, are bought in, and are equipped with the knowledge and competency to play their part in the execution. This story illustrates the steps that were taken beyond just a communication of the strategy and providing training, to ensure that the wider teams were involved in the strategy execution ensuring buy in and ownership.
S6	What's New?	to illustrate that there is no point in adapting a strategy if the analytics teams are not enabled to execute it due to a lack of resources or focus. In a busy organisational environment, the demands of reacting to BAU challenges can often distract teams and take available resources away from the execution strategy. This story shows that by structuring the allocation of strategy implementation resources (such as those allocated to

#	Story Title	The Motivation for Telling this Story is...
		innovation as per the analytics strategy), it is possible to ensure that a balance is maintained between the short term BAU demands and the longer-term strategy execution.
S7	Sowing the Seeds of Glory	it illustrates the benefit of intentionally developing change in the organisation culture in order to create the right environment for the successful execution of the strategy. The evangelising in the form of presentation and discussions with other cross functional teams was not related directly to immediate BAU requirements but was intended to advance the overall organisational culture towards a data-driven organisation. In addition to helping to advance the cultural change, the initiative resulted in the identification of opportunities which would not otherwise have occurred.
S8	It's Not Me, It's You!	it highlights the importance of ensuring that the teams are constantly supported and developed to build the skills and competencies to execute the analytics strategy. Once the teams fully understand and buy into the strategy and are equipped and empowered to deliver it, they do not need to be micromanaged and will themselves assume the ownership for the strategy execution.
S9	The Consumer (Data) is Not Always Right	it highlights the importance of consistent communication of strategy to team members otherwise they lose faith in the strategy and can suspect that leadership is not bought into the strategy, so they are unlikely to do so. The story also highlights the need for alignment across the organisation's strategy. In this case there was a misalignment between the marketing function strategy of collecting consumer data with the analytics strategy

#	Story Title	The Motivation for Telling this Story is...
		of only collecting data with a clear purpose or potential purpose. This had led to confusion and raised some doubts amongst the analytics teams.
S10	You have Reached Your Destination	to discuss the successful outcome of the strategy execution. It is vital to monitor the performance of the strategy execution and in this case the story illustrates how the purpose of the strategy was observed to be achieved as gut-based decision making was replaced with data driven / data informed decision making. The performance of the strategy execution is not monitored by tracking the completion of the strategic actions but rather on the monitoring of the impact of the execution and realisation of the purpose of the strategy.
S11	Getting into the Trenches	to recognise that it is not only the front-line teams who need to develop their skills and competencies to execute the strategy. The organisations leadership also need to ensure that they themselves develop their skills to lead and drive the execution of the strategy. In so doing the leadership also demonstrated that they are committed to the strategy thereby increasing the likelihood of team members buying-into the strategy and committing to their own development.
S12	Hurry Up – This way to Success	it represents one of the significant change management milestones in the journey of ensuring team buy-in for the new strategy. Rather than just presenting the analytics strategy, the team spent time reflecting on its own purpose, and contributing to the development of the new analytics strategy which significantly increased the sense of ownership amongst team members for the strategy execution and reduced the resistance to change which could otherwise have existed (particularly amongst more experienced team members)

Table 14: Analytics Leader's Story Title and Story Motivation

The Analytics Leader's Story Analysis (mechanics)

In this section we present a description of our research approach to analysing the analytics leader's stories. Similar to (Rosemann & Vessey, 2008) we view the *importance* dimension of research relevance for IS practitioners as research that “*meets the needs of practice by addressing a real-world problem in a timely manner [currently significant], and in such a way that it can act as the starting point for providing an eventual solution*”. Therefore, we believe that our approach strengthens the relevance of our research outputs for practitioners, where the practitioner's voice and their lexicon are central to the grounded analysis and the outputs produced. In this practitioner paper, we adopt a three-stage abductive “human-in-the-loop” (HITL) grounded theorising approach. Within a grounded theorising context, ‘human-in-the-loop’ work configurations explore how Generative Artificial Intelligence (GenAI) can automate tasks (e.g. qualitative data analysis), thereby freeing up a researcher's capacity to focus on novel and creative problem-solving in their research (c.f. Berente et al., 2019; Grønsund & Aanestad, 2020; Pan et al., 2023; Sammon et al., 2024a; Wagner et al., 2022). Specifically, Grønsund and Aanestad (2020) define ‘human-in-the-loop’ (HITL) configurations as an augmented approach to work that consists of two activities: *auditing* and *altering*, where *auditing* refers to a researcher's interrogation of algorithmic outputs “*guided by methodological best practices*” and *altering* refers to a researcher's adjustments “*to improve algorithmic outputs and address any gaps*” (e.g. “*the execution of additional prompts*”) (Sammon et al., 2024a, p. 6).

For the purposes of this research, we conceptualise GenAI (e.g. ChatGPT4) as a ‘*style engine*’, and specifically as a ‘*creative assistant*’ archetype, highlighting “*new possibilities for creation and exploration*” (Riemer & Peter, 2024, p. 3). When conceptualised as a ‘*creative assistant*’ archetype, GenAI (e.g. ChatGPT4) is used to achieve a specific outcome (*task-driven* and *transactional*) such as analysing text to extract key points and themes or creating tables and charts for data visualisation (Riemer & Peter, 2024). Furthermore, as a ‘*creative assistant*’ archetype, ChatGPT4 can act as “*discussion partners to explore hypothetical ideas*” or guide a user when exploring complex topics (Riemer & Peter, 2024, p. 6). Furthermore, Jarvenpaa and Klein (2024, p. 117) argue that in a human-GenAI collaboration, the GenAI assistant can

“carry out thought experiments and perspective-taking to reduce myopia; expand rationale and supporting arguments” and “perform independent coding of data/empirical evidence used in developing a theory”. Finally, by design, GenAI relies on probabilistic models rather than deterministic algorithms, which means that the content they generate is *“according to likenesses”* (Riemer & Peter, 2024, p. 2). As a result, Riemer and Peter (2024, p. 2) state that *“representing features of input data probabilistically is characteristic of how these systems work, and therefore what they are and how best to use them”*. Many have highlighted the ability of a GenAI, like ChatGPT4, to offer fresh perspectives and inspiration for creative *“imaginative endeavours”* (Amankwah-Amoah et al., 2024, p. 8).

It is argued that grounded theory (GT) research has a *“clear creative component”* which requires the researcher to navigate a *“healthy tension”* between interpretative effort (*meaning to be assigned to units of data*) and the coding effort (*mechanical application of technique*) (Suddaby, 2006, p. 638). Ultimately, the researcher’s analytic ability and theoretical sensitivity (generating theoretical categories from analytical codes and establishing relationships between these categories) lie at the core of GT (Stol et al., 2016) and developing grounded theory (Suddaby, 2006). However, despite its popularity, considerable confusion surrounds the essential methods that characterise a grounded theorising approach to research (Birks et al., 2019). Some of the methods essential to grounded theorising include the following: *initial* (e.g. open), *intermediate* (e.g. axial), and *advanced* (e.g. selective) coding of data (c.f. Chun Tie et al., 2019), and constant comparative analysis using inductive and abductive logic (c.f. Birks et al., 2019) which considers the theoretical sensitivity of the researcher and their use of existing literature. Ultimately, the quality of grounded theorising output depends on the *“transparent, precise adherence to the essential GT methods”* (Birks et al., 2019, p. 2).

Each stage of our approach aligns closely with *open*, *axial* and *selective* (OAS) coding, taking us from the ***messy*** reality of unstructured text (analytics leader’s stories), through a structured theoretical informed ***matrix***, and onto a ***model*** of analytics leadership (see Figure 14). Therefore, through a considered set of prompts, we use ChatGPT4 for OAS coding (on the 12 Analytics Leader’s stories) to enable a transparent grounded theorising process. However, it is worth mentioning that in this research

ChatGPT4 is viewed as an “*augmentative tool*” rather than a “*replacement tool*”, therefore, it is not being used to automate the OAS coding process and shift the coding process dynamic “*away from the human*” (Sammon et al., 2024b, p. 4) In fact, as visualised in Figure 14, ChatGPT4 is not used directly during selective coding, although our selective coding work is informed, indirectly, by the ChatGPT4-generated, open and axial coding, outputs. Furthermore, in axial coding much of the prompts are used for content *evaluation* as opposed to content *generation* purposes (c.f. Sammon et al., 2024b), whereas in open coding, the ChatGPT4 prompt is specifically for content generation.

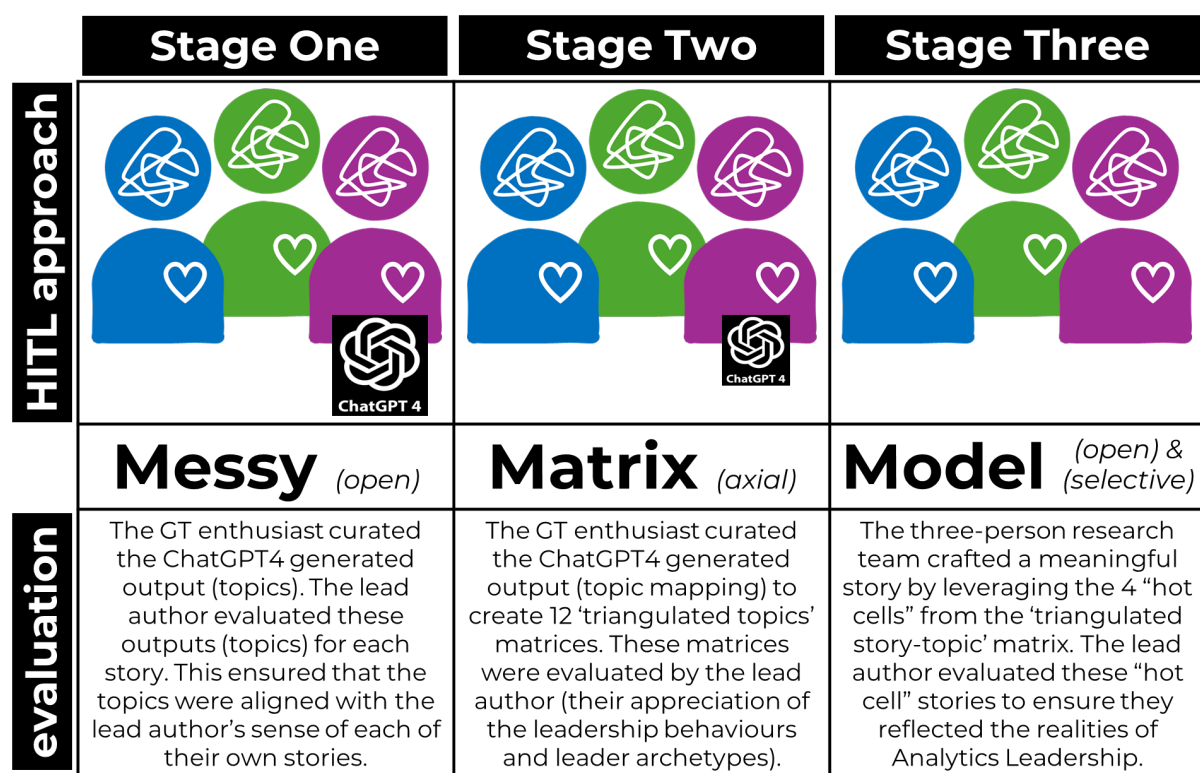


Figure 14: Our “Messy-Matrix-Model” Sequence (leveraging open, axial and selective coding)

Our Three-Stage Approach Implementation

The six-month (January to June 2024) abductive HITL grounded theorising approach afforded the research team the opportunity to move between data (12 stories of the analytics leader) and theory leadership behaviours from Yukl (2002) and leader archetypes from Korherr et al. (2022) in an iterative fashion. As visualised in Figure 14,

the silhouettes of the three-person research team are represented by different colours to represent their uniqueness and their contribution. For example, blue represents trust and collaboration, green symbolises growth and innovation, while purple represents creativity and vision. It is also worth noting that ChatGPT4 is represented as a black box. The three-person research team performed various roles based on their respective areas of interest. For example, the lead author (the analytics leader) took responsibility for not only curating the 12 stories (drafted throughout their tenure as an analytics leader) but also for evaluating the ChatGPT4-generated coding outputs, whereas the 2nd author (a GT enthusiast) took responsibility for executing the prompts on ChatGPT4, while also curating and evaluating the coded outputs. Furthermore, the 3rd author not only evaluated the ChatGPT4-generated coding outputs but also took the lead in structuring the presentation of the outputs to maximise presentation clarity. Therefore, within the context of our abductive HITL grounded theorising approach, our *auditing* criteria included *accuracy* (the output accurately reflected the data (analytics leader's stories) and is free from error e.g. hallucinations), *clarity* (the output coherently summarises the original meaning of the data), and *plausibility* (the output captures the lead author's (analytics leader) real-world understanding) (c.f. Sammon et al., 2024b, p. 6). Being vigilant about accuracy, clarity, and plausibility ensured that the research team checked the "*veracity*" of the ChatGPT4-generated outputs, helping to mitigate against the risk of "*hallucinations*" and thereby taking "*responsibility for the text*" as both qualitative data analysts and authors of this practitioner paper (c.f. Davison et al., 2024, p. 1437).

In Stage One, we take an inductive open coding approach to generate the topics of conversation from the 12 analytics leader's stories. Taking each story individually, ChatGPT4 was utilised to identify the topics using Prompt 1 (see prompts detailed in Appendix B: Paper 4 ChatGPT Prompts). Across all stories, 78 topics emerged (see section titled The Analytics Leader's Story Analysis (mechanics) for the topics and description). The lead author evaluated every topic for every story and ensured the topics were aligned with the essence of the story as the lead author intended. On completing the review of the outputs from the first three stories, the lead author commented that "*the outputs resonate very well (better than I had expected) and I*

wouldn't be contradicting anything. I have added some comments". This expression of surprise signals a growing confidence in the abductive HITL grounded theorising approach. At this early stage in the coding process, we also calculated an inter-coder reliability (ICR) estimate using the simple approach of "*direct agreements*" between coders (a percentage of agreement between 0% and 100%) (c.f. Burla et al., 2008, p. 114). Unexpectedly, this coding similarity score was 100% (between the lead author, 3rd author and the 2nd author ChatGPT4-generated outputs). As suggested by Thummadi et al. (2024, p. 8) being aware of this similarity score helps "*address the issues of confirmation and selection bias by exposing any underlying assumptions to critique from other human coders*". The output of this evaluation session laid the foundation to continue analysing the nine remaining lead author stories in Stage One (using an inductive open coding approach).

In Stage Two, we introduced two theoretical frames (Leadership Behaviours from Yukl (2002) and Leader Archetypes from Korherr et al. (2022)). The rationale for employing two theories is due to the complex and multifaceted nature of analytics leadership. Unlike generic leadership roles, analytics leaders must navigate a shifting organisational landscape that blends technical execution with strategic transformation. This dual responsibility necessitates both a fine-grained behavioural lens and a broader interpretive understanding of leadership identities. By synthesising Yukl's (2002) behavioural model with Korherr et al.'s archetypal framework, this paper develops a dual-lens approach to understanding analytics leadership. This theoretical integration allows the research to account for both what analytics leaders do (Yukl et al.) and who they are or become in different organisational moments (Korherr et al.).

Yukl's behavioural taxonomy is a robust, empirically validated framework that groups leadership behaviours into three categories: task, relations, and change (Yukl et al., 2002). It has been widely used to analyse leadership across a range of organisational contexts and provides a clear structure for classifying observable leadership practices:

- **Task Behaviours** (e.g., planning, clarifying roles, monitoring performance) are directly relevant to the delivery-focused aspects of BA leadership, such as managing analytics projects and overseeing model implementation.

- **Relations Behaviours** (e.g., supporting team members, recognising contributions, consulting on decisions) are essential for leading cross-functional teams comprising both technical and business stakeholders.
- **Change Behaviours** (e.g., scanning the environment, articulating a vision, encouraging innovation) speak directly to the transformative role BA leaders play in driving data-centric thinking across the organisation.

The framework enables this research to categorise and interpret leadership actions with conceptual clarity, providing a structured lens through which to examine how analytics leaders operationalise their roles across strategic, technical, and social domains.

In contrast to Yukl's behavioural model, Korherr et al. (2022) propose a role-based perspective grounded in empirical research on senior leaders steering organisations toward data-driven maturity. Their framework identifies four archetypes—Analytical Thinker, Coach, Guide, and Strategist—each representing a distinct leadership orientation characterised by different strengths, contributions, and postures within the transformation process:

- **The Analytical Thinker** brings deep technical expertise and an evidence-based mindset, often acting as a translator between analytics and business domains.
- **The Coach** fosters collaboration, psychological safety, and cohesion within multi-disciplinary teams.
- **The Guide**, often a senior executive, lends experience, credibility, and stability during periods of change.
- **The Strategist** promotes long-term vision and innovation, often pushing against institutional inertia to champion new ways of thinking.

Korherr et al.'s model was selected because it is one of the few peer-reviewed frameworks explicitly derived from and designed for the analytics transformation context. It aligns closely with this paper's focus on understanding how analytics leaders are positioned and perceived across different organisational moments, particularly as they shift between operational, relational, and strategic demands. It also complements Yukl's model by offering insight into leadership identity and posture, allowing the

research to go beyond what analytics leaders do to explore the kinds of leaders they are and become.

Using the lead author's appreciation of these concepts, the three leadership behaviours (*task, relations, and change*) and four leader archetypes (*analytical thinker, coach, guide, and strategist*) were used to create a 3x4 matrix (as an analytical device) to structure a deductive axial coding approach in analysing the outputs of Stage One. Visualised in Figure 15 (with all story-specific matrices available in each story in the section titled The Analytics Leader's Story Analysis (mechanics)), prompts 2-6 were executed in a sequential fashion on each story and set of topic outputs emerging from Stage One. Prompt 2 established the leadership behaviours of relevance from the story text. Prompt 3 mapped the story topics to specific leadership behaviours. At this point, the researchers actively looked for hallucinations or evidence of topics mapped to leadership behaviours not relevant to the story. Prompts 4 and 5 replicated this process for leader archetypes. Prompt 6 was used to identify leadership behaviour and leader archetype intersections from the story text, which resulted in an 'X' being placed in each of the relevant intersections. Finally, using the *audited* output from prompts 3 and 5, only topics intersecting on cells identified in prompt 6 (with an 'X') are highlighted green and deemed substantiated. However, relevant topics that intersect in any other cell are denoted with an 'O' and deemed unsubstantiated. Iterating through this process for the 12 stories, the resulting matrices (see Figure 16 to Figure 27) were aggregated into one single matrix (see Figure 28).

Interestingly, in reviewing the coded outputs during Stage Two, the lead author picked up on an *"interesting issue"* with ChatGPT4. The lead author commented *"I'm just up to validating story 10.... an interesting issue has come up in this story which was a risk but is in fact ok. ChatGPT is recognising leadership behaviours and leader archetypes in the stories very well but is also including those from other characters in the stories, not just me. In story 10 a lot of the output refers to the Sales and Marketing Managers behaviour in the story"*. However, on further re-examination of the story the lead author revealed that it was in fact their issue, as the story was not written clearly as a first-person account. The lead author reflects that *"luckily, the way the other stories were written (unintentionally) means only my leadership behaviours are in the stories"*. This

“interesting issue” afforded the lead author the opportunity to recast the story, and thereafter, the GT enthusiast re-ran the 6 prompts to regenerate the ChatGPT4 coded outputs.

Where a topic (of relevance) ends up as unsubstantiated (outcome of our deductive axial coding) we believe it speaks more to the quality of the story narrative (*first person autobiographical phenomenological accounts*) than it does to the relevance of the topic itself. For stories with unsubstantiated topics, ChatGPT4 most often responded that the evidence of the impact of the analytics leader’s action was not obvious and needed to be strengthened with explicit evidence of the impact. Therefore, the substantiated/unsubstantiated classification sparked rich conversation and debate amongst the three-person research team as part of their *auditing* of the Stage Two outputs. This *auditing* (for accuracy, clarity and plausibility) afforded the research team the opportunity to appreciate that while everything can be deemed relevant, there is a need to be selective and stand over our inductive open coding and deductive axial coding as part of our abductive HITL grounded theorising approach. There is no doubt that the outputs of Stage Two of our approach (each triangulated topics matrix) shapes *“the patterns”* that we see and *“the inferences”* we have drawn from these patterns (Miranda et al., 2022, p. vi).

Our Stage Three work afforded us the opportunity to appreciate the “hot cells” in the matrix (given the distribution of the mapped topics across all stories) and the practical implications for analytics leaders emerging from these “hot cells”. Overall, in Stage Three, we identify four “hot cells” and following further analysis (manual inductive open coding) of the 67 topics associated with these four “hot cells”, 19 themes emerge that capture the key elements (“so what?”) of an analytics leader who successfully bridged the analytics strategy-execution gap (see Figure 28). These 19 themes inform our theoretical story that emerges from our abductive selective coding. These thematic insights are presented in The Analytics Leader’s Story Insights section, while our model of analytics leadership is presented in the Bridging the Analytics Strategy-Execution Gap: Concluding Remarks section. In summary, our work highlights that *“pattern surfacing is a deliberate, selective, and generative human act”* where our *“lexical framing influences what patterns we notice, how we express them, and how we interpret*

them” (Miranda et al., 2022, p. vi). Overall, through a “*combination of experience, intuition, and logic*” (Miranda et al., 2022, p. vii), we believe that our work (culminating in the Analytics Leadership model – see Figure 28) contributes to the analytics leadership conversation. We also appreciate that our abductive HITL grounded theorising approach showcases a process (***messy-matrix-model***) that allows us to make contribution, however, we also understand that while unique this “*contribution is imperfect*” (Miranda et al., 2022, p. viii).

Leadership Behaviour Axial Coding

It's Not Me, It's You!

		Leadership Behaviour			Relevant Topic
		Task	Relations	Change	
Leader Archetype	Analytical Thinker				1,3
	Coach				4,6
	Guide				2
	Strategist				2,5
Relevant					

prompt 2 establishes the behaviours of relevance in the story

LLM Topics

1. Empowering Leadership
2. Data-Driven Business Transformation
3. Team Development and Individual Growth
4. Adaptation to Agile Work Environments
5. Mentorship and Coaching
6. Recognition and Career Advancement

It's Not Me, It's You!

		Leadership Behaviour			Relevant Topic
		Task	Relations	Change	
Leader Archetype	Analytical Thinker				1,3
	Coach				4,6
	Guide				2
	Strategist				2,5
Relevant Topic		2	1,3,5	4,6	

prompt 3 maps the topics to a specific behaviour

LLM Topics

1. Empowering Leadership
2. Data-Driven Business Transformation
3. Team Development and Individual Growth
4. Adaptation to Agile Work Environments
5. Mentorship and Coaching
6. Recognition and Career Advancement

Leader Archetype Axial Coding

It's Not Me, It's You!

		Leadership Behaviour			Relevant
		Task	Relations	Change	
Leader Archetype	Analytical Thinker				
	Coach				
	Guide				
	Strategist				
Relevant					

prompt 4 establishes the archetypes of relevance in the story

LLM Topics

1. Empowering Leadership
2. Data-Driven Business Transformation
3. Team Development and Individual Growth
4. Adaptation to Agile Work Environments
5. Mentorship and Coaching
6. Recognition and Career Advancement

It's Not Me, It's You!

		Leadership Behaviour			Relevant Topic
		Task	Relations	Change	
Leader Archetype	Analytical Thinker				2
	Coach				1,3
	Guide				4,6
	Strategist				2,5
Relevant Topic		1,3	4,6	2,5	

prompt 5 maps the topics to a specific archetype

LLM Topics

1. Empowering Leadership
2. Data-Driven Business Transformation
3. Team Development and Individual Growth
4. Adaptation to Agile Work Environments
5. Mentorship and Coaching
6. Recognition and Career Advancement

Behaviour/Archetype Axial Coding

It's Not Me, It's You!

		Leadership Behaviour			Relevant Topic
		Task	Relations	Change	
Leader Archetype	Analytical Thinker	X		X	1,3
	Coach		X		4,6
	Guide		X		2
	Strategist			X	2,5
Relevant Topic		1,3	4,6	2,5	

prompt 6 maps the behaviours to the archetypes, enabling an 'X' to be placed in a relevant cell

It's Not Me, It's You!

		Leadership Behaviour			Relevant Topic
		Task	Relations	Change	
Leader Archetype	Analytical Thinker	X (2)		X	2
	Coach		X (1,3)		1,3
	Guide		X	O	4,6
	Strategist	O	O	X	2,5
Relevant Topic		2	1,3,5	4,6	

green cells are identified where topics of relevance to behaviours & archetypes intersect in a cell denoted with an 'X'; however, relevant topics that intersect in any other cell are denoted with a 'O'

Figure 15: The Evolution of a Triangulated Topics Matrix (story eight example)

The Analytics Leader's Story Analysis (meaning)

In this section we present an analysis of the 12 Analytics Leader's stories. This analysis presents each story on a 3x4 matrix (the evolution for which was presented in Figure 15).

Story One: "Raising the Heineken Profile"

Summary: this story describes one of the key shifts (engaging externally) that was required to raise the profile of HEINEKEN to successfully transform to become data-driven. The story generated nine topics, six of which were substantiated. This pattern emerges from our deductive axial coding.

Raising the Heineken Profile

		Leadership Behaviour			Relevant Topic
		Task	Relations	Change	
Leader Archetype	Analytical Thinker	X (1,6)		X	1,6
	Coach		X (5)		5
	Guide		X	X (7)	7
	Strategist	X	X	X (2,4)	2,4
Relevant Topic		1,6	3,5	2,4,7	
LLM Topics					
1. Recruitment Challenges		4. Participation in Industry Events		7. Challenges in Diverse Markets	
2. Profile Raising in the D&A Community		5. Team Development and Recognition		8. Continued Engagement and Impact	
3. Engagement with Educational Institutions		6. Internship Programmes		9. Recruitment Success Post-Profile Raising	

Figure 16: Story One Triangulated Topics Matrix

Substantiated Topics:

The substantiated topics provide a detailed account of the challenges and successes in building a robust Data and Analytics (D&A) team. Early **(S1T1) Recruitment Challenges** highlight the struggle to compete with more data-centric companies for top talent, underscoring the need for a strategic pivot. This shift involved **(S1T2) Profile Raising in the D&A Community**, where the analytics leader proactively engaged with local

educational institutions and professional bodies to establish its presence as a leader in the analytics space. **(S1T4) Participation in Industry Events**, particularly through the Analytics Institute of Ireland, further amplified this effort, significantly boosting visibility and appeal among professionals. Additionally, initiatives like the **(S1T6) Internship Programmes** evolved into a key pipeline for attracting high-quality candidates, reflecting the effectiveness of these profile-raising efforts. Success stories of **(S1T5) Team Development and Recognition**, showcased through industry awards, not only bolstered morale but also elevated the team's profile, while the narrative also acknowledges **(S1T7) Challenges in Diverse Markets**, where cultural and sectoral barriers required tailored approaches to recruitment in certain regions.

Unsubstantiated Topics:

Three topics that were identified from the story text were not triangulated (**S1T3**, **S1T8**, and **S1T9**). These unsubstantiated topics touch on promising but less detailed initiatives (analytics leader's actions) that contributed to the evolving recruitment strategy. For example, **(S1T3) Engagement with Educational Institutions** mentions efforts like guest lectures and networking to attract graduates. Similarly, **(S1T8) Continued Engagement and Impact** describes ongoing participation in high-profile D&A conferences, but more specifics on how these efforts tangibly enhanced employer branding would strengthen the narrative. Lastly, **(S1T9) Recruitment Success Post-Profile Raising** hints at significant improvements in attracting candidates for critical roles, yet it remains unclear which specific actions were most impactful in achieving this transformation.

Story Two: "Show me the Money"

Summary: this story demonstrates how the analytics strategy was brought to life and forced a change in thinking and engagement amongst not only stakeholders in other functions but also the D&A team. The story generated eight topics, surprisingly six of which were unsubstantiated. This does not trivialise their relevance to the analytics leader's actions, however, it highlights that the impact of the analytics leader's action

(related to these topics) was not as obvious in the story. This pattern emerges from our deductive axial coding.

Show me the Money

Leader Archetype	Leadership Behaviour			Relevant Topic
	Task	Relations	Change	
	Analytical Thinker	X (1)	○	1,5
	Coach	○	X	2,7
	Guide	○	X (8)	3,8
	Strategist		○	4,6
Relevant Topic		1,2,3	4,6	5,7,8

LLM Topics

1. Demand for Analytics Solutions
2. Resource Constraints in D&A Team
3. Strategic Alignment and Prioritization

4. Analytics as a Service Model
5. Integration and Enhancement of Third-party Solutions
6. Financial Model and Rate Card

7. Flexible Team Expansion
8. Navigating Corporate Structures

Figure 17: Story Two Triangulated Topics Matrix

Substantiated Topics:

The substantiated topics illustrate HEINEKEN Ireland's journey toward embracing analytics solutions and navigating organisational complexities. By 2017, there was a clear **(S2T1) Demand for Analytics Solutions**, reflecting a growing recognition within the organisation of the benefits of data-driven decision-making. This increasing demand marked a pivotal moment, underscoring the strategic value of analytics in shaping business operations and outcomes. Alongside this growth, the **(S2T8) Navigation of Corporate Structures** presented challenges, particularly in managing the narrative with HR regarding the team's size and structure as contractors were brought in to address scaling needs. These efforts of the analytics leader required careful communication and strategic management to ensure alignment with corporate policies while meeting the expanding analytics requirements.

Unsubstantiated Topics:

The unsubstantiated topics explore creative but less-documented strategies that HEINEKEN Ireland employed to address resource constraints and scale analytics capabilities. Despite significant **(S2T2) Resource Constraints in the D&A Team**, where 60% of business requests were turned down, the team (led by the analytics leader) introduced an **(S2T4) Analytics as a Service Model**, allowing business units to pay for custom solutions. This innovative approach enabled the team to prioritise use cases aligned with strategic goals **((S2T3) Strategic Alignment and Prioritisation)** while generating revenue to support **(S2T7) Flexible Team Expansion** through contractors without permanently increasing FTE counts. Additionally, tools like a **(S2T6) Financial Model and Rate Card** were introduced to estimate costs for business units, helping assess the return on investment for analytics projects. Other initiatives, such as **(S2T5) Integration and Enhancement of Third-party Solutions**, highlight creative ways to maximise value by improving existing tools.

Story Three: “Getting AME Back on Track”

Summary: this story highlights the importance of continuous monitoring of performance and the responsibility of analytics leaders to take corrective action to ensure achievement of KPIs. The story generated six topics, and all six were substantiated. Again, this highlights the impact of the analytics leader’s actions, (related to these story topics). This pattern emerges from our deductive axial coding.

Leader Archetype	Leadership Behaviour			Relevant Topic
	Task	Relations	Change	
	Analytical Thinker	X (3)		3
	Coach		X (4)	4
	Guide	X (1)	X (5)	1,5
	Strategist		X (2,6)	2,6
Relevant Topic		1,3	4,5	2,6

LLM Topics

1. Analytics Targets in AME

2. Optimism vs. Reality in Analytics Predictions

3. Performance Monitoring and Dashboard Development

4. Leadership and Team Guidance

5. Stakeholder Engagement and Review Processes

6. Achieving and Exceeding Targets

Figure 18: Story Three Triangulated Topics Matrix

Substantiated Topics:

The substantiated topics provide a detailed narrative of how AME Region (led by the analytics leader) tackled analytics challenges and achieved remarkable outcomes in 2023. Faced with ambitious analytics targets ((**S3T1**) **Analytics Targets in AME**) set on high-level assumptions due to the immaturity of the Regional Analytics Hub, the team encountered a significant gap between (**S3T2**) **Optimism vs. Reality in Analytics Predictions** by mid-year. To address these issues, the leader emphasised (**S3T3**) **Performance Monitoring and Dashboard Development**, guiding the creation of a tracking system for analytics use cases and value delivery. This process exposed skill gaps among BI developers and Analytics Product Managers, prompting the analytics leader, with their strong business background, to provide hands-on direction in KPI tracking and dashboard design ((**S3T4**) **Leadership and Team Guidance**). Additionally, the implementation of (**S3T5**) **Stakeholder Engagement and Review Processes**, including frequent updates with global directors and the D&A team, ensured accountability and alignment. These focused efforts culminated in AME not only achieving but exceeding their analytics value targets ((**S3T6**) **Achieving and Exceeding**

Targets), solidifying their reputation as a top-performing region for the second consecutive year.

Unsubstantiated Topics:
There are no unsubstantiated topics in this story.

Story Four: “Trade Census F**K Up”

Summary: this story illustrates many aspects of the realities of executing an analytics strategy as part of a digital transformation and the role of leadership in ensuring a successful outcome. The story generated eight topics, six of which were substantiated.

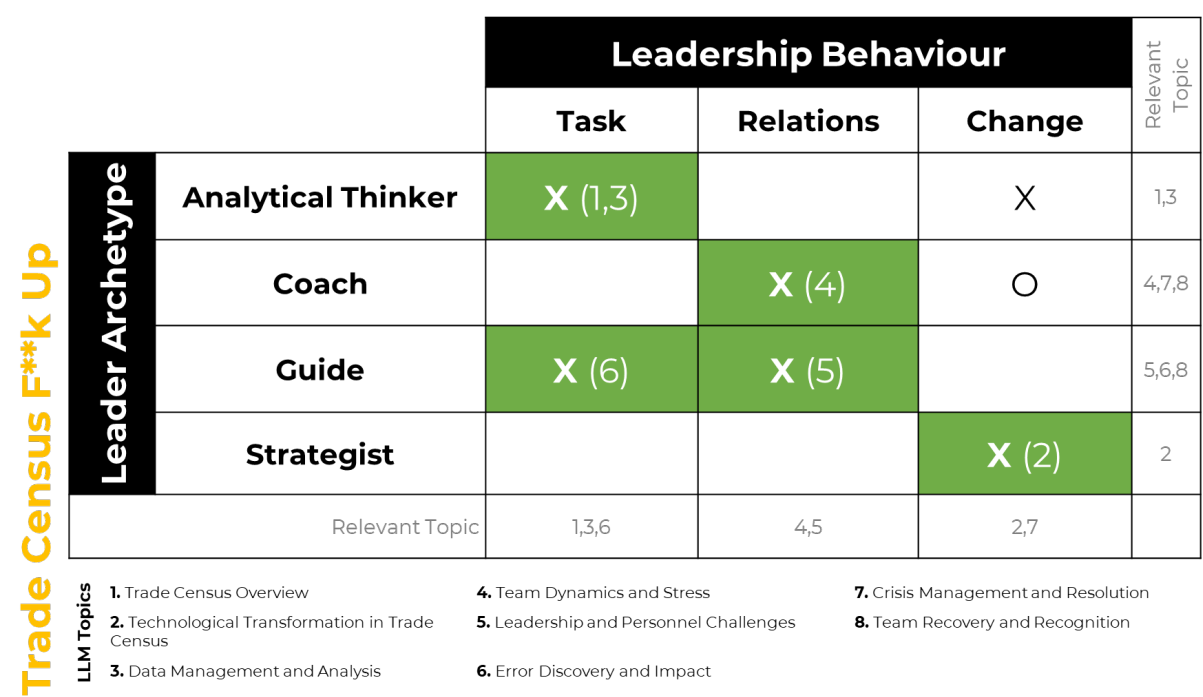


Figure 19: Story Four Triangulated Topics Matrix

Substantiated Topics:

The substantiated topics provide a comprehensive view of the Trade Census project and its impact on organisational operations and team dynamics. The **(S4T1) Trade Census Overview** describes the biennial survey conducted to gather detailed pub-level competitor performance data, including sales volumes, distribution points, and venue characteristics, providing critical insights for commercial strategies. By 2017, the **(S4T2) Technological Transformation in Trade Census** saw significant upgrades, such as mobile apps and AI-generated insights, replacing the traditional pre-2015 methods and revolutionising the data collection and analysis process. The new process, which involved collecting data through sales representatives, storing it in a CRM system, and analysing it via SQL databases, exemplifies the focus on **(S4T3) Data Management and Analysis**, delivering actionable insights for commercial teams. However, the story also touches on the human aspect of these transformations, highlighting **(S4T4) Team Dynamics and Stress**, where high workloads during the presentation phase led to tensions among team members, compounded by **(S4T5) Leadership and Personnel Challenges** like managing underperformance and conflicts. A critical moment arose with **(S4T6) Error Discovery and Impact**, where a major error in data handling required decisive leadership from the analytics leader to address reputational damage and rebuild team morale.

Unsubstantiated Topics:

The unsubstantiated topics offer a narrative of the analytics leader's role in crisis resolution and team recovery. In **(S4T7) Crisis Management and Resolution**, the analytics leader is credited with taking responsibility for a significant data error, mitigating stakeholder concerns, and implementing corrective measures to restore trust and accuracy. This proactive approach is said to have showcased strong crisis management skills. Furthermore, **(S4T8) Team Recovery and Recognition** claims that the team, following the crisis, regained its morale and integrity, with improved dynamics leading to the analytics leader's eventual recognition and promotion. These topics suggest impactful leadership and organisational improvement, illustrating how the team's recovery unfolded and the tangible outcomes of these efforts.

Story Five: “Data Tribe”

Summary: this story illustrates the steps that were taken beyond just a communication of the strategy and providing training, to ensure that the wider teams were involved in the strategy execution ensuring buy in and ownership. The story generated eight topics, seven of which were substantiated.

Data Tribe	Leader Archetype	Leadership Behaviour			Relevant Topic
		Task	Relations	Change	
	Analytical Thinker	X (4)	○		4
	Coach		X (2,7)		2,7
	Guide	○	X (5,8)	X (3,8)	3,5,8
	Strategist	○	○	X (1,8)	1,6,8
Relevant Topic		4,5,6	2,4,5,7,8	1,3,8	
LLM Topics		1. Organizational Transformation 2. Team Collaboration 3. Data-Driven Culture	4. Data Champions 5. Role of Leadership 6. Sustainability and Scalability	7. Empowerment through Training 8. Data Tribe Initiative	

Figure 20: Story Five Triangulated Topics Matrix

Substantiated Topics:

The substantiated topics explore the holistic approach required of the analytics leader to drive an organisation-wide transformation in data and analytics (D&A). The emphasis on **(S5T1) Organisational Transformation** highlights that success in D&A extends beyond technology, requiring cross-functional collaboration and alignment to achieve meaningful business impact. This transformation is supported by fostering **(S5T2) Team Collaboration**, framing D&A as a collective effort where members from various departments contribute to data-driven projects. Integral to this effort is the cultivation of a **(S5T3) Data-Driven Culture**, ensuring employees are equipped to think analytically and make informed decisions based on data insights. The analytics leader’s

introduction of **(S5T4) Data Champions** within sales teams exemplifies this cultural shift, as these individuals work alongside the D&A team to develop solutions and disseminate analytical skills through hands-on experience. Additionally, the **(S5T5) Role of Leadership** is emphasised, with senior leaders acting as sponsors to champion data-driven initiatives across their functions. Training programs aimed at **(S5T7) Empowerment through Training** ensure both sponsors and champions have the skills necessary to drive these initiatives. The **(S5T8) Data Tribe Initiative**, consisting of a dedicated group of sponsors and champions from various business functions, represents the analytics leader's structured approach to embedding an analytical mindset and fostering collaborative solution development with the central D&A team.

Unsubstantiated Topics:

The unsubstantiated topics highlight concerns about the **(S5T6) Sustainability and Scalability** of D&A initiatives. The critique focuses on the limitations of relying on a small team to manage expansive data-driven decision-making processes, suggesting that such an approach risks bottlenecks and inefficiencies as the organisation grows. This perspective underscores the importance of scalability in achieving long-term success.

Story Six: "What's New?"

Summary: this story describes the challenge of executing an analytics strategy and balancing the short-term demands of the D&A team and the long-term demands of the organisation. The story generated five topics, all of which were substantiated.

What's New?

Leader Archetype	Leadership Behaviour			Relevant Topic
	Task	Relations	Change	
	Analytical Thinker	X (4)	○	4
	Coach	○	X (2,3)	2,3
	Guide	X (3,5)	○	3,5
	Strategist	○	○	X (1,4,5)
Relevant Topic		3,4,5	2,3,5	1,4,5

LLM Topics
 1. Adaptability and Innovation
 2. Feedback and Team Dynamics
 3. Internship Programs and Talent Development
 4. Experimentation and Learning
 5. Formalizing Innovation Initiatives (ACE)

Figure 21: Story Six Triangulated Topics Matrix

Substantiated Topics:

The substantiated topics showcase the analytics leader’s focus on fostering a culture of adaptability, innovation, and talent development within the organisation. **(S6T1)**

Adaptability and Innovation highlight the analytics leader’s proactive approach to challenging established processes, even when functioning well, in the pursuit of continuous improvement and forward-thinking solutions **((S6T2) Feedback and Team Dynamics)**. This mindset extends to the **(S6T3) Internship Programmes and Talent Development**, where the introduction of interns into the Ireland OpCo D&A team brings fresh perspectives and skills to tackle specific business challenges, such as leveraging NLP and computer vision technologies. Additionally, the narrative emphasises the value of **(S6T4) Experimentation and Learning** through initiatives like ACE, a formalised programme that enables employees to step away from their routine responsibilities and engage in innovative projects **((S6T5) Formalising Innovation Initiatives (ACE))**. By providing a structured yet pressure-free environment, the ACE initiative encourages creative exploration, where both successes and failures serve as valuable learning experiences. These efforts collectively reinforce the organisation’s commitment to

staying ahead in a dynamic business environment while building a resilient and forward-looking team.

Unsubstantiated Topics:
There are no unsubstantiated topics in this story.

Story Seven: “Sowing the Seeds of Glory”

Summary: this story illustrates the benefit of intentionally developing change in the organisation culture in order to create the right environment for the successful execution of the strategy. The story generated eight topics, all of which were substantiated.

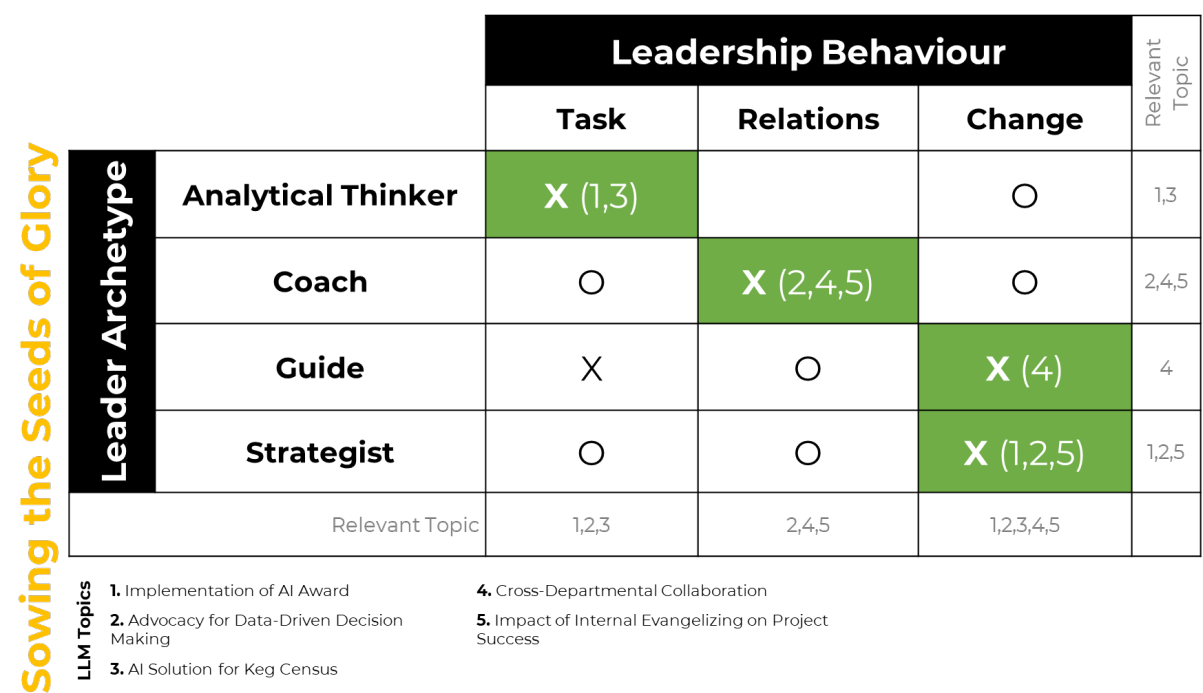


Figure 22: Story Seven Triangulated Topics Matrix

Substantiated Topics:

The substantiated topics highlight HEINEKEN Ireland's innovative use of artificial intelligence and the analytics leadership that drove its success. The **(S7T1) Implementation of an AI Award** showcases the organisation's recognition for deploying an AI solution during COVID-19 to optimise keg distribution among pubs, marking a milestone in integrating technology into operational processes. This achievement was supported by the analytics leader's **(S7T2) Advocacy for Data-Driven Decision Making**, which fostered a culture of valuing data insights across the organisation, laying the groundwork for successful AI projects. A specific example, the **(S7T3) AI Solution for Keg Census**, replaced a manual tracking system with an AI model to monitor empty and full kegs at pubs, delivering greater accuracy while reducing time and costs. The success of this initiative was underpinned by **(S7T4) Cross-Departmental Collaboration**, where proactive engagement, such as presentations and educational events, encouraged cooperation between departments to solve the keg census problem. Finally, the **(S7T5) Impact of Internal Evangelising on Project Success** underscores how the analytics leader's efforts to promote data analytics within the organisation played a critical role in the development of this award-winning AI project, demonstrating how leadership and effective communication can drive technological innovation and deliver significant business impact.

Unsubstantiated Topics:

There are no unsubstantiated topics in this story.

Story Eight: "It's Not Me, It's You!"

Summary: this story describes the realities of ensuring that analytics teams are constantly supported and developed to build the skills and competencies to execute the analytics strategy. The story generated six topics, three of which were substantiated.

It's Not Me, It's You!

Leader Archetype	Leadership Behaviour			Relevant Topic
	Task	Relations	Change	
	Analytical Thinker	X (2)	X	2
	Coach	X (1,3)		1,3
	Guide	X	O	4,6
	Strategist	O	X	2,5
Relevant Topic		2	1,3,5	4,6

LLM Topics

1. Empowering Leadership

2. Data-Driven Business Transformation

3. Team Development and Individual Growth

4. Adaptation to Agile Work Environments

5. Mentorship and Coaching

6. Recognition and Career Advancement

Figure 23: Story Eight Triangulated Topics Matrix

Substantiated Topics:

The substantiated topics highlight well-supported narratives of leadership, transformation, and growth within the organisational context. For instance, the concept of **(S8T1) Empowering Leadership** showcases how the analytics leader fosters autonomy by encouraging team members to take charge and excel independently, resulting in mutual pride in their successes. Another example is the impact of the **Trade Census** project (**(S8T2) Data-Driven Business Transformation**), which underscores the pivotal role of data-driven initiatives in shaping commercial decisions and operational strategies within the organisation. This project exemplifies how data-centric transformations can advance an organisation’s culture and drive business outcomes. Additionally, a strong commitment to **(S8T3) Team Development and Individual Growth** is evident through the analytics leader’s efforts to nurture team members both personally and professionally, ensuring they are equipped to thrive in their roles and make meaningful contributions to the organisation.

Unsubstantiated Topics:

The unsubstantiated topics focus on concepts that are compelling but lack detailed evidence or examples to fully support their claims. For instance, **(S8T4) Adaptation to Agile Work Environments** explores the challenges of transitioning from traditional work models to agile, team-oriented frameworks, emphasising the need for flexibility and a willingness to embrace continuous learning. Similarly, the topic of **(S8T5) Mentorship and Coaching** highlights the potential benefits of guidance from seasoned colleagues, such as enhanced technical skills and interpersonal growth. Lastly, **(S8T6) Recognition and Career Advancement** discusses the positive outcomes of acknowledging employee achievements, such as improved performance and career progression.

Story Nine: “The Consumer (Data) is Not Always Right”

Summary: this story describes the realities of a misalignment between a business function (marketing) data strategy and the analytics strategy approach of prioritising data initiatives on business impact.

The Consumer (Data) is Not Always Right

LLM Topics	Leader Archetype	Leadership Behaviour			Relevant Topic
		Task	Relations	Change	
	Analytical Thinker	X (1,2,4)		X (1,2,3,4)	1,2,3,4
	Coach	O	X (5,7)	X (5)	5,7
	Guide	O	X (5,7,8)	X (2,4,6,7,8)	2,4,5,6,7,8
	Strategist	O	O	X (1,3,6,8)	1,3,6,8
Relevant Topic		1,2,4,5,7	5,7,8	1,2,3,4,6,7,8	

1. AME D&A Strategy
2. Solid Foundation for Data
3. Global Data Collection Initiatives
4. Deployment of Consumer Data Solutions
5. Challenges in Data Utilization
6. Relevance of Consumer Data in Different Regions
7. Decision to Halt Deployment
8. Leadership and Strategy Adherence

Figure 24: Story Nine Triangulated Topics Matrix

Substantiated Topics:

The substantiated topics detail the AME Region strategic approach to leveraging data and analytics ((**S9T1**) **AME D&A Strategy**:) to generate actionable business value while navigating significant challenges. Central to this strategy is the focus on producing outputs that are valuable, actionable, and feasible, supported by a (**S9T2**) **Solid Foundation for Data** that ensures consumer data is collected and utilised securely, lawfully, and ethically. This aligns with HEINEKEN's global ambition, led by the Chief Marketing Officer, to expand (**S9T3**) **Global Data Collection Initiatives**, especially in light of restrictions on cookie usage. By the second quarter of 2023, this vision materialised with the (**S9T4**) **Deployment of Consumer Data Solutions** in several operational companies (OpCos). However, challenges soon emerged; Data Utilization ((**S9T5**) **Challenges in Data Utilization**) lagged behind infrastructure deployment, as initial OpCos lacked relevant analytics use cases, prompting a temporary halt in further rollouts. Additionally, differences in the (**S9T6**) **Relevance of Consumer Data in Different Regions**, where European use cases failed to resonate with the African market context, underscored the need for region-specific strategies. Demonstrating decisive (**S9T8**) **Leadership and Strategy Adherence**, the analytics leader paused further deployments ((**S9T7**) **Decision to Halt Deployment**) until marketing teams could identify meaningful, business-aligned use cases, ensuring a balanced, pragmatic approach to achieving strategic goals.

Unsubstantiated Topics:

There are no unsubstantiated topics in this story.

Story Ten: "You have Reached Your Destination"

Summary: this story illustrates how the purpose of the strategy was observed to be achieved as gut-based decision making was replaced with data driven / data informed decision making. The story generated five topics, four of which were substantiated.

You have Reached your Destination

LLM Topics	Leader Archetype	Leadership Behaviour			Relevant Topic
		Task	Relations	Change	
	Analytical Thinker	X (5)		○	3,5
	Coach		X (1)		1
	Guide			X (4)	4
	Strategist			X (2)	2
Relevant Topic		5	1	2,3,4	

1. Employee Recognition

2. External Validation and Awards

3. Regional Successes in Data Analytics

4. Cultural Shift to Data-Driven Decision Making

5. Practical Implementation of Data-Driven Strategies

Figure 25: Story Ten Triangulated Topics Matrix

Substantiated Topics:

The substantiated topics highlight key moments of success and transformation within HEINEKEN’s data-driven journey, showcasing both individual and organisational achievements. **(S10T1) Employee Recognition** emerges as a powerful motivator, exemplified by a BI Developer in HEINEKEN Ireland receiving the “Employee of the Year” award for their impactful contributions to business intelligence. This acknowledgment reflects not only the individual’s dedication but also the value placed on analytics within the organisation (driven by the analytics leader). Similarly, **(S10T2) External Validation and Awards** reinforce HEINEKEN’s standing in the analytics community, with the Ireland OpCo earning the prestigious Analytics & AI Award for implementing advanced AI technologies. These recognitions parallel a broader **(S10T4) Cultural Shift to Data-Driven Decision Making**, where senior leaders in Ireland now rely on data over intuition during strategic discussions, signifying a significant evolution in mindset. This shift is further illustrated by the **(S10T5) Practical Implementation of Data-Driven Strategies**, such as a brand manager transitioning from a traditional distribution approach to one

grounded in detailed data analysis, underscoring how analytics directly informs and optimises commercial strategies.

Unsubstantiated Topics:
The unsubstantiated topics allude to promising **(S10T3) Regional Successes in Data Analytics**, particularly in the AME region. For instance, AME achievements, such as winning a global D&T award and leading in analytics-derived value, hint at strong performance and innovative practices across multiple markets.

Story Eleven: “Getting into the Trenches”

Summary: this story outlines a need for the organisations leadership to develop their skills to lead and drive the execution of the strategy. The story generated six topics, four of which were substantiated.

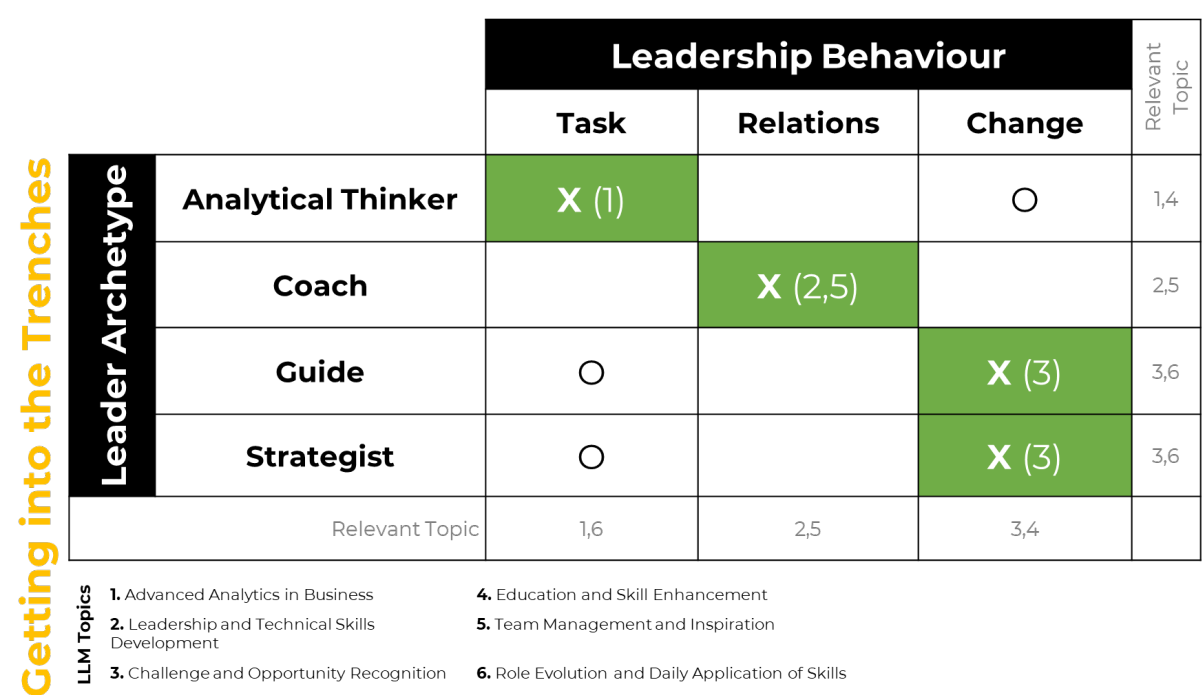


Figure 26: Story Eleven Triangulated Topics Matrix

Substantiated Topics:

The substantiated topics highlight the analytics leader's journey to integrate advanced analytics and machine learning into business practices while simultaneously fostering a high-performing team. This emphasises the application of **(S11T1) Advanced Analytics in Business**, showcasing how sophisticated tools and methodologies were employed to address real-world corporate challenges. This effort was supported by the analytics leader's deliberate focus on **(S11T2) Leadership and Technical Skills Development**, where they honed their expertise to bridge the gap between technical complexities and strategic guidance. Moreover, the analytics leader demonstrated exceptional insight in **(S11T3) Challenge and Opportunity Recognition**, pushing the team to reevaluate initial assessments and uncover overlooked intersections between business needs and analytical opportunities. These efforts culminated in inspiring team management **((S11T5) Team Management and Inspiration)**, where the analytics leader's enhanced skills enabled them to challenge and motivate their data scientists to identify and seize opportunities that previously went unnoticed, driving both team growth and business value.

Unsubstantiated Topics:

The unsubstantiated topics explore the analytics leader's proactive steps toward personal and professional growth. For instance, the decision to pursue further **(S11T4) Education and Skill Enhancement** through a higher diploma in Data Science reflects a commitment to understanding technical challenges faced by the team, though the impact of this education on their leadership effectiveness remains unspecified. Similarly, the discussion of the analytics leader's **(S11T6) Role Evolution and Daily Application of Skills** offers intriguing insights into their transition from hands-on technical work to a more strategic regional role. However, how these skills influenced team dynamics or business outcomes is less certain, therefore, the broader significance of this role shift remains underexplored.

Story Twelve: “Hurry Up – This way to Success”

Summary: this story represents one of the significant change management milestones in the journey of ensuring team buy-in for the new strategy. The story generated five topics, three of which were substantiated.

Hurry Up – This Way to Success

		Leadership Behaviour			Relevant Topic
		Task	Relations	Change	
Leader Archetype	Analytical Thinker	X (1)	○	X (5)	1,5
	Coach	○	X	○	3,4
	Guide		X (2)	X	2
	Strategist	○	○	X (5)	1,5
Relevant Topic		1,3	2,5	4,5	

LLM Topics

1. Visionary Thinking and Adoption of New Technologies

2. Challenges in Leadership and Pace of Change

3. Developing and Adapting Team Capabilities

4. Change Management and Organizational Culture

5. Empowering Teams with New Tools and Technologies

Figure 27: Story Twelve Triangulated Topics Matrix

Substantiated Topics:

The substantiated topics capture the analytics leader’s forward-thinking approach and the tangible impact of their efforts to drive innovation and change. **(S12T1) Visionary Thinking and Adoption of New Technologies** highlight the analytics leader’s commitment to integrating cutting-edge analytics methods to enhance business operations, despite resistance from colleagues. This determination is exemplified by the **(S12T5) Empowering Teams with New Tools and Technologies** initiative, where the analytics leader replaced an outdated Excel-based Trade Census system with a PowerApps solution, encouraging the team to adopt automation and real-time data analysis. However, the **(S12T2) Challenges in Leadership and Pace of Change** reveal

the complexities of implementing such initiatives; colleagues, including senior figures like the HEINEKEN Ireland Leadership Team, expressed concerns about the pace of adoption, indicating the need for balanced, inclusive approaches to innovation. These dynamics underline the analytics leader's strategic focus on aligning technological advancements with organisational readiness.

Unsubstantiated Topics:

The unsubstantiated topics highlight the analytics leader's a proactive approach to change and their efforts to transform team capabilities and culture but lack detailed evidence of the outcomes. **(S12T3) Developing and Adapting Team Capabilities** emphasises how off-site meetings were organised to redefine the team's purpose and better align their work with the overarching data & analytics strategy, addressing reluctance to adopt new methods. Similarly, **(S12T4) Change Management and Organisational Culture** outlines the addition of an "Organisational Culture" pillar to the team's strategy and participation in off-sites and external conferences to foster a forward-thinking mindset.

The Analytics Leader's Story Insights

Our analysis shows that being an effective analytics leader capable of 'bridging the strategy-execution gap' requires a holistic leadership approach, where the interplay between the four leader archetypes highlights the complex, multi-faceted nature of effective leadership behaviour in achieving data-driven organisational change. As part of our analysis, we identified 4 "hot cells" (>50% story coverage) as follows: 'Analytical Thinker/Task Behaviour', 'Coach/Relations Behaviour', 'Guide/Change Behaviour', and 'Strategist/Change Behaviour'. See Figure 28 for a 'triangulated story-topic' matrix (covering all 12 analytics leader's stories) that highlights the distribution of the story topics across the 4 "hot cells". Throughout this section we focus on the core themes emerging from a synthesis of these "hot cells". In each section, this synthesis was the outcome of our return to inductive open coding. This coding was completed by the 2nd and 3rd authors and the output was *audited* by the lead author. We break down these core themes, discussing the implications and practical applications for an analytics

leader working to bridge the gap between analytics strategy and execution in a traditional organisation.

		Leadership Behaviour		
		Task	Relations	Change
Story Topic Matrix	Leader Archetype	Analytical Thinker	S1T1, S1T6, S2T1, S3T3, S4T1, S4T3, S5T4, S6T4, S7T1, S7T3, S8T2, S9T1, S9T2, S9T4, S10T5, S11T1, S12T1	S9T1, S9T2, S9T3, S9T4, S12T5
		Coach	S1T5, S3T4, S4T4, S5T2, S5T7, S6T2, S6T3, S7T2, S7T4, S7T5, S8T1, S8T3, S9T5, S9T7, S10T1, S11T2, S11T5	S9T5
		Guide	S3T1, S3T6, S6T3, S6T5, S3T5, S4T5, S5T5, S5T8, S9T5, S9T7, S9T8, S12T2	S1T7, S2T8, S5T3, S5T8, S6T5, S7T4, S9T2, S9T4, S9T6, S9T7, S9T8, S10T4, S11T3
		Strategist		S1T2, S1T4, S3T2, S3T6, S4T2, S5T1, S5T8, S6T1, S6T4, S6T5, S7T1, S7T2, S7T5, S9T1, S9T3, S9T6, S9T8, S10T2, S11T3, S12T5

Figure 28: Triangulated Story-Topic Matrix (four hot cells highlighted in green)

The ‘Analytical Thinker/Task Behaviour’ Themes

Within this “hot cell” we synthesise the 17 story topics into four core themes, namely: *Strategic Planning and Execution*, *Operational Excellence and Performance Monitoring*, *Cultural Transformation through Data Literacy and Collaboration*, and *Innovation and Technological Advancement*. As highlighted in Table 15, by synthesising the 17 story topics into these four core themes, the analytical ‘Tasks’ and characteristics associated with the “Analytical Thinker” archetype are effectively captured. Each theme encompasses aspects of strategic foresight, operational acumen, and a culture of innovation and collaboration, all essential for an analytics leader to drive data-centric transformation in a traditional organisation. It is worth appreciating that Yukl (2002) identifies ‘Task Behaviours’ as involving the following: *plan short-term activities*, *clarify task objectives and role expectations*, *monitor operations and performance*. Furthermore, (Korherr et al., 2022), the ‘Analytical Thinker’ is rational, logical, possess

good technological understanding of analytics and strives for the implementation of technically optimum analytics models to answer business questions or issues. They are also keen to share their technical expertise and tend to be well connected, not only within the organisation but also to external analytics specialists.

Topic	Explanation	Theme
(S1T1) Recruitment Challenges	These underline the strategic initiatives to build and refine the team, addressing initial recruitment challenges through internships and other strategies that bolster team capabilities.	Strategic Planning and Execution
(S1T6) Internship Programmes		
(S9T1) AME D&A Strategy	Illustrate strategic planning in setting a robust analytics strategy and establishing a strong data infrastructure to support ongoing and future analytical needs.	
(S9T2) Solid Foundation for Data		
(S12T1) Visionary Thinking and Adoption of New Technologies	Highlights forward-thinking strategies to keep abreast of and implement new technologies.	
(S3T3) Performance Monitoring and Dashboard Development	Directly aligns with the task of monitoring operations and clarifying objectives through the development of performance dashboards.	Operational Excellence and Performance Monitoring
(S4T3) Data Management and Analysis	Reflects operational tasks involving the collection, management, and analysis of critical data to drive performance insights.	
(S4T1) Trade Census Overview		
(S7T3) AI Solution for Keg Census	Demonstrates the application of AI solutions to optimize operations and receive industry recognition, enhancing operational efficiency.	
(S7T1) Implementation of AI Award		
(S5T4) Data Champions	These topics highlight the initiatives to foster a data-driven culture through advocacy and hands-on learning within teams.	Cultural Transformation through Data Literacy and Collaboration
(S6T4) Experimentation and Learning		
(S8T2) Data-Driven Business Transformation	Showcases the transformative impacts of data-driven approaches on business strategies and operations.	
(S10T5) Practical Implementation of Data-Driven Strategies		
(S2T1) Demand for Analytics Solutions	Chapter 6 Reflects a broader organisational transformation where data literacy is becoming crucial, and collaboration across different teams and departments is necessary to harness the power of analytics.	
(S11T1) Advanced Analytics in Business	Chapter 7 These topics are crucial for understanding the integration of advanced analytics into solving complex business problems and deploying consumer data solutions to enhance operational efficiencies.	Innovation and Technological Advancement
(S9T4) Deployment of Consumer Data Solutions		

Table 15: ‘Analytical Thinker/Task Behaviour’ Topic to Theme Mapping

Four implications for practice, linked to these “hot cell” (Analytical Thinker Archetype/Task Behaviour) themes, emerge and are presented below.

1. **Strategic Planning and Execution:** For an analytics leader, this means establishing and continuously refining recruitment and development programmes (like internships) to build a skilled analytics team, setting a solid data foundation, and staying ahead with technological advancements. Practically, this involves crafting actionable strategies that specify short-term and long-term analytics goals, ensuring that the organisation’s data infrastructure supports these goals.
2. **Operational Excellence and Performance Monitoring:** Practically, an analytics leader should implement robust data management practices and performance monitoring systems like dashboards that provide real-time insights into business operations. This enables the leader to make informed decisions that improve operational efficiency and effectiveness, ultimately reducing the gap between strategy and execution by making adjustments based on data-driven insights.
3. **Cultural Transformation through Data Literacy and Collaboration:** In practice, an analytics leader needs to champion data literacy initiatives and collaborative projects that integrate data insights into everyday business practices. Initiatives like creating 'data champions' within teams and encouraging experimentation and learning can help embed a data-driven mindset throughout the organisation, thereby reducing resistance and enhancing the adoption of analytics solutions.
4. **Innovation and Technological Advancement:** For an analytics leader, it’s critical to continuously explore and implement advanced analytics technologies and methodologies, such as AI and machine learning, to solve complex business problems. This not only improves business operations but also drives the organisation towards a more innovative, agile, and data-driven future. Practically, this involves staying updated with technological trends and finding ways to integrate these advancements effectively within the organisation’s existing systems.

Based on our approach, these themes and their implications guide an analytics leader in strategically managing the integration of analytics into a traditional organisation, thereby bridging the gap between the analytics strategy and its execution. To address the analytics strategy-execution gap, an analytics leader must take a multifaceted approach. This includes recruitment by positioning the organisation as a data-driven innovator, enhancing its employer brand, and building talent pipelines through internship programs and academic partnerships. Capability-building involves investing in upskilling internal teams, particularly BI developers and product managers, to address skill gaps and enable the delivery of high-impact analytics solutions. Driving cultural change is crucial, achieved by fostering a data-driven mindset through initiatives like appointing data champions, showcasing successful analytics use cases, and embedding analytics in decision-making processes across departments. To ensure operational efficiency, the leader must streamline data management workflows, adopt scalable technologies like AI, and optimize processes, such as transitioning manual tasks to automated solutions. Finally, (and in the words of the lead author – *most critically*), is the aligning of analytics initiatives with business goals through a clear, actionable strategy ensures that projects are focused on delivering measurable value, securing executive buy-in, and bridging the gap between strategy and execution.

The ‘Coach/Relations Behaviour’ Themes

Within this “hot cell” we synthesise the 17 story topics into five core themes, namely: *Empowerment and Skill Development*, *Recognition and Team Achievement*, *Collaborative Leadership*, *Navigating Challenges and Conflict*, and *Strategic Decision Making and Impact*. As highlighted in Table 16, by synthesizing the 17 story topics into these five core themes, the key areas of focus for an analytics leader from a ‘Relations’ behaviours and ‘Coach’ leader archetype perspective are captured. Each theme encapsulates multiple related topics and aligns with the ‘Coach’ leader attributes of support, recognition, skill development, decision consultation, and empowerment. These themes also highlight how specific actions and strategies can influence an

organisation's data-driven transformation. Each theme ties back to fostering an environment where team members feel valued, empowered, and skilled enough to contribute to broader organisational goals. It is worth appreciating that Yukl (2002) identifies 'Relations Behaviours' as involving the following: *"provide support and encouragement"*, *"provide recognition for achievements and contributions"*, *"develop member skill and confidence"*, *"consult with members when making decisions"*, *"empower members to take initiative in problem solving"*. Furthermore, (Korherr et al., 2022), the "Coach" archetype possesses strong soft skills such as problem-solving, conflict resolution, communication, patience and situational awareness. While they contribute less to the design of analytics solutions, the competencies and characteristics which they bring to the data-driven transformation are crucial as they lead the diverse set of data and business specialists across the organisation to collaborate in a constructive way to achieve the common data-driven transformation goal.

Topic	Explanation	Theme
(S5T7) Empowerment through Training	Training initiatives empower team members to take initiative and enhance their problem-solving capabilities, a key attribute of the ‘Coach’ archetype.	Empowerment and Skill Development
(S6T3) Internship Programmes and Talent Development	By integrating interns, the leader fosters a fresh perspective and skills development, aligning with nurturing future talent.	
(S8T1) Empowering Leadership	Encouraging autonomy and confidence among team members embodies the ‘Coach’ archetype’s focus on developing member skills and confidence.	
(S8T3) Team Development and Individual Growth	Fostering an environment where team members are not only equipped with the necessary skills but are also empowered to take initiative and apply their skills effectively.	
(S11T2) Leadership and Technical Skills Development	Enhancing personal technical skills to better lead and guide the team underlines the importance of continuous learning and teaching.	
(S1T5) Team Development and Recognition	Recognizing team achievements publicly boosts morale and acknowledges collective efforts.	Chapter 8 Recognition and Team Achievement
(S10T1) Employee Recognition	Individual recognition, like the “Employee of the Year” award, highlights the importance of celebrating personal contributions to team success.	
(S5T2) Team Collaboration	Highlights the collaborative nature of data and analytics as essential for driving organisational goals.	Collaborative Leadership
(S7T4) Cross-Departmental Collaboration	Engaging other departments ensures holistic problem-solving and reflects the 'Coach' archetype’s emphasis on inclusive decision-making.	
(S7T5) Impact of Internal Evangelising on Project Success	Demonstrates the leader’s role in promoting collaboration through advocacy of data-driven practices.	
(S4T4) Team Dynamics and Stress	Managing team dynamics during high-pressure periods reflects the leader’s role in providing support and mitigating conflict.	Navigating Challenges and Conflict
(S6T2) Feedback and Team Dynamics	Adjusting pace and approach in response to team feedback showcases situational awareness and adaptability.	
(S9T5) Challenges in Data Utilization	Making strategic decisions based on current challenges demonstrates a pragmatic and responsive leadership style.	
(S9T7) Decision to Halt Deployment		
(S7T2) Advocacy for Data-Driven Decision Making	The leader’s commitment to fostering a data-centric culture aligns with empowering the organisation to leverage data for strategic decisions.	Strategic Decision Making and Impact

Topic	Explanation	Theme
(S3T4) Leadership and Team Guidance	Providing clear guidance on business-centric measures and KPIs ensures alignment with organisational goals.	
(S11T5) Team Management and Inspiration	Inspiring the team to leverage technical skills for new opportunities emphasizes forward-thinking leadership.	

Table 16: ‘Coach/Relations Behaviour’ Topic to Theme Mapping

Five implications for practice, linked to these “hot cell” (Coach Archetype/Relations Behaviour) themes, emerge and are presented below.

1. **Empowerment and Skill Development:** In practice, an analytics leader can bridge the strategy-execution gap by instituting robust training programmes and promoting hands-on experiences through projects that challenge the team. By developing technical competencies and empowering team members to apply new skills in practical settings, leaders can ensure that the team not only understands the analytics strategy but is also capable of executing it effectively.
2. **Recognition and Team Achievement:** For an analytics leader in a traditional organisation, implementing a systematic recognition programme can help close the gap between strategy and execution. By acknowledging both team and individual achievements, leaders reinforce the behaviours and outcomes that align with the organisation’s analytics strategy, thus encouraging a culture of excellence and continuous improvement.
3. **Collaborative Leadership:** To effectively bridge the gap in a traditional organisation, an analytics leader should promote cross-functional teams and facilitate collaboration through regular interdisciplinary meetings and joint projects. This not only enhances the application of analytics across different domains but also ensures that varied departmental insights are incorporated into the execution of analytics strategies.
4. **Navigating Challenges and Conflict:** In practice, an analytics leader can manage the strategy-execution gap by maintaining open lines of communication and proactively addressing the signs of stress and conflict. By fostering a supportive environment, leaders can ensure that team members remain focused and productive, even when facing the inherent challenges of integrating analytics into traditional business models.
5. **Strategic Decision Making and Impact:** For an analytics leader, effectively applying this theme means continuously aligning analytics initiatives with the overarching business strategy and demonstrating clear business value. By

making data-driven decisions and linking them back to strategic goals, leaders can ensure that the organisation not only embraces the analytics strategy but also sees tangible results from its execution. This approach is vital in traditional organisations where analytics may initially be viewed as peripheral rather than integral to business success.

Based on our approach, these themes and their implications guide an analytics leader in strategically managing the integration of analytics into a traditional organisation, thereby bridging the gap between the analytics strategy and its execution. To close the analytics strategy-execution gap, an analytics leader must adopt a balanced approach to leadership, integrating team building, technical guidance, strategic alignment, and cultural transformation. By fostering a collaborative and supportive team environment, the leader ensures morale is high and recognition is embedded, motivating individuals to excel personally and professionally. Technical guidance plays a crucial role, as the leader bridges the gap between technical outputs and business needs, offering clear direction on KPI tracking and analytics use cases. Strategic alignment is prioritised by focusing resources on initiatives that deliver measurable business value, halting or adapting projects that lack relevance or impact. Simultaneously, cultural transformation is driven through advocacy, training, and storytelling, promoting a data-driven mindset across the organisation. By empowering team members, celebrating successes, and engaging with stakeholders at all levels, the leader not only elevates the analytics function but also ensures its integration into core business strategies, enabling sustainable and impactful execution.

The ‘Guide/Change Behaviour’ Themes

Within this “hot cell” we synthesise the 13 story topics into four core themes, namely: *Cultivating a Data-Driven and Innovative Culture*, *Strategic Alignment and Adaptation*, *Enhancing Operational Integration through Technology*, and *Navigating Organisational Dynamics*. As highlighted Table 17, by synthesising the 13 story topics into these four

core themes, the key areas of focus for an analytics leader especially from a change behaviours perspective involves aligning these topics with the attributes of a 'Guide' leader archetype. The themes are framed to encompass the necessary change in behaviours through monitoring, proposing innovative strategies, encouraging innovation, and taking risks to promote necessary changes. Each theme aligns with a segment of change behaviour, emphasising the analytics leader's role in not only harnessing data and technology but also in navigating, leading, and strategically positioning the organisation in line with its long-term vision and current market needs. The 'Guide' archetype's extensive experience and business acumen are crucial in this context, providing the necessary leadership to manage and inspire change effectively. Yukl (2002) identified 'Change Behaviours' as involving the following: *"monitor the external environment", "propose an innovative strategy or new vision", "encourage innovative thinking", "take risks to promote necessary changes"*. (Korherr et al., 2022), the "Guide" has accumulated long term leadership experience and possesses extensive business expertise including deep knowledge of the market, customers, competitors, and business operations. They represent a large percentage of senior executives in organisations and based on their wealth of knowledge, experience and credibility are solid leaders who can effectively handle difficult situations which is essential especially during turbulent stages of a data-driven transformation.

Four implications for practice, linked to this "hot cell" (Guide Archetype/Change Behaviour) themes, emerge and are presented below.

1. **Cultivating a Data-Driven and Innovative Culture:** In practice, an analytics leader can bridge the strategy-execution gap by instituting formal programmes like the ACE initiative that promote experimentation and learning. Establishing groups like the Data Tribe encourages cross-functional collaboration and integration of analytics into all business functions. This ensures that the analytics strategy is not just a top-down directive but a fundamental part of the organisational ethos, leading to better alignment and execution of strategic goals.

2. **Strategic Alignment and Adaptation:** For an analytics leader, actively monitoring and adapting analytics strategies to align with both the external market and internal capabilities are vital. This might involve pausing projects that do not demonstrate immediate value, as well as adjusting strategies to better suit different regional needs. Such actions ensure that the organisation remains agile and can effectively bridge the gap between analytics strategy and its practical implementation.
3. **Enhancing Operational Integration through Technology:** In a traditional organisation, an analytics leader must focus on building a solid data foundation and integrating data-driven solutions into daily operations. This involves not only deploying new technologies but also ensuring that these technologies are accepted and effectively utilised across departments. By doing so, the leader can close the gap between the strategy formulated at the executive level and its execution on the ground, ensuring that analytics becomes a cornerstone of operational processes.
4. **Navigating Organisational Dynamics:** For an analytics leader in a traditional organisation, navigating corporate structures and managing stakeholder expectations are crucial skills. This involves communicating the value and implications of analytics initiatives clearly and managing the changes in team dynamics and organisational structures that these initiatives may necessitate. Effectively handling these aspects can significantly smooth the transition from strategy to execution, ensuring that analytics strategies are effectively realised in practice.

Based on our approach, these themes and their implications guide an analytics leader in strategically managing the integration of analytics into a traditional organisation, thereby bridging the gap between the analytics strategy and its execution. To close the analytics strategy-execution gap, an analytics leader must address recruitment barriers, strengthen collaboration, foster cultural change, and ensure strategic alignment. Tackling recruitment challenges involves tailoring strategies to attract talent in competitive or culturally resistant markets by emphasising innovation, offering clear

career growth pathways, and promoting the unique impact of data and analytics roles. Strengthening collaboration is achieved by establishing cross-functional initiatives like the “Data Tribe”, where sponsors and champions from various departments work alongside the D&A team to drive analytics adoption and develop solutions. Cultural change is cultivated by embedding a data-driven mindset across the organisation, offering training programmes, and encouraging leaders to rely on data over intuition in strategic decisions. To ensure strategic alignment, the leader enforces disciplined adherence to plans, prioritising initiatives that deliver measurable business value while pausing those lacking clear relevance or impact. Through these actions, the leader creates an environment where analytics can thrive, bridging the gap between strategy and execution.

Topic	Explanation	Theme
(S5T3) Data-Driven Culture	Emphasizes developing a culture where decisions are based on data rather than intuition. This is crucial for fostering innovative thinking as it aligns with the Guide's ability to use extensive business expertise in decision-making.	Cultivating a Data-Driven and Innovative Culture
(S5T8) Data Tribe Initiative	Proposing innovative strategies by structuring environments that nurture experimentation and collaborative problem-solving across business functions.	
(S6T5) Formalizing Innovation Initiatives (ACE)		
(S10T4) Cultural Shift to Data-Driven Decision Making	Directly illustrates the leadership’s push towards data over intuition, highlighting the shift in behaviours towards a more analytical approach, a critical aspect under the Guide archetype.	
(S11T3) Challenge and Opportunity Recognition	Shows the leader's engagement in challenging conventional thinking and spotting underexplored opportunities, essential for promoting innovative changes in strategy and technology applications.	
(S1T7) Challenges in Diverse Markets	Understanding and adapting strategies to fit different cultural and market dynamics, which is key in monitoring the external environment.	Strategic Alignment and Adaptation
(S9T6) Relevance of Consumer Data in Different Regions		
(S9T7) Decision to Halt Deployment	Reflects the Guide’s experience and strategic prowess, demonstrating risk-taking in leadership to ensure business value before proceeding, aligning closely with the need to monitor and adapt strategies based on market feedback.	
(S9T8) Leadership and Strategy Adherence	underscores the importance of maintaining strategic focus amidst potential disruptions, showing the Guide's ability to steer the team through complexities, crucial during data-driven transformations.	
(S7T4) Cross-Departmental Collaboration	Illustrates the proactive steps taken by the leader to facilitate integration between departments through data solutions, enhancing operational effectiveness and innovation in solving practical problems.	Enhancing Operational Integration through Technology
(S9T2) Solid Foundation for Data	Reflect the core tasks of building a secure and effective data infrastructure, crucial for operationalizing data-driven strategies and ensuring that new technologies are implemented thoughtfully and effectively.	
(S9T4) Deployment of Consumer Data Solutions		
(S2T8) Navigating Corporate Structures	Deals with the internal challenges of managing changes in team structure and dynamics, an essential aspect of the Guide's role in navigating and managing internal stakeholders and aligning them with new strategic visions.	Navigating Organisational Dynamics

Table 17: 'Guide/Change Behaviour' Topic to Theme Mapping

The ‘Strategist/Change Behaviour’ Themes

Within this “hot cell” we synthesise the 20 story topics into four core themes, namely *Strategic Vision and Innovation*, *Advocacy and Evangelizing for Data-Driven Culture*, *Leadership in Driving Change*, and *Recognition and Impact of Innovations*. As highlighted in Table 18, by synthesising the 20 story topics into these four core themes, the key areas of focus for an analytics leader especially from a change behaviours perspective involves aligning these topics with the attributes of a ‘Strategist’ leader archetype. Each theme is crucial in defining the leadership approach and strategic direction of an analytics leader from a ‘Strategist’ perspective, focusing on promoting innovation, advocating for data-driven decision making, and leading transformative change within the organisation. These activities not only reflect the ability to adapt and innovate but also demonstrate the leader’s commitment to cultivating a robust, forward-thinking environment that can sustain data-driven transformations. Yukl (2002) identified ‘Change Behaviours’ as involving the following: “*monitor the external environment*”, “*propose an innovative strategy or new vision*”, “*encourage innovative thinking*”, “*take risks to promote necessary changes*”. Furthermore, (Korherr et al., 2022), the “Strategist” is characterised by strategic visionary thinking with a strong enthusiasm for technical innovations. They provide employees with the space for innovation and encourage their teams to break out of entrenched, rigid thought processes, which especially in well-established organisations, is essential to enable data-driven transformation.

Four implications for practice, linked to this “hot cell” (Guide Archetype/Change Behaviour) themes, emerge and are presented below.

1. **Strategic Vision and Innovation:** For an analytics leader aiming to bridge the strategy-execution gap in a traditional organisation, this theme emphasises the need to implement forward-thinking technologies and methodologies like AI, machine learning, and mobile solutions. Practically, it requires leaders to continually evaluate and adapt their technological and strategic approaches, ensuring that their teams are not only equipped with the latest tools but also

have the mindset to challenge traditional methods and think beyond current processes.

2. **Advocacy and Evangelizing for Data-Driven Culture:** In practice, an analytics leader must actively communicate the value of data-driven decision-making through various platforms and initiatives, such as workshops, seminars, and strategic meetings. They should focus on demonstrating how data insights lead to better business outcomes, thus advocating for a shift from intuition-based to data-informed decision-making. This involves not only promoting the use of data but also ensuring that there are accessible tools and a supportive culture that encourages all members of the organisation to engage with data analytics.
3. **Leadership in Driving Change:** Practically, the analytics leader must be prepared to lead by example, showing a willingness to take calculated risks and make tough decisions that may initially be unpopular. They need to foster an environment where change is not only accepted but expected, and where innovation is part of the daily routine. This might involve restructuring teams, redefining roles, and constantly seeking new business opportunities through analytics.
4. **Recognition and Impact of Innovations:** For an Analytics Leader, it's important to not only focus on achieving innovative outcomes but also to ensure these innovations are recognised both internally and externally. This involves submitting projects for awards, publicising successes through case studies, and using these recognitions to secure further investment in analytics initiatives. Internally, celebrating these achievements can motivate teams and reinforce the value of adopting new technologies and methods, helping to close the gap between strategy and execution.

Based on our approach, these themes and their implications guide an analytics leader in strategically managing the integration of analytics into a traditional organisation, thereby bridging the gap between the analytics strategy and its execution. To close the analytics strategy-execution gap, an analytics leader must balance strategic alignment,

innovation, collaboration, and cultural transformation. By aligning analytics initiatives with business objectives, the leader ensures projects deliver measurable value and address specific organisational goals. Simultaneously, innovation is fostered through the introduction of new tools, technologies, and methods, such as automating processes and leveraging AI, which enable teams to explore advanced solutions. Collaboration is strengthened by initiatives like cross-functional “Data Tribes” and active engagement with stakeholders through educational events and workshops, ensuring collective ownership of analytics efforts. Cultural transformation is achieved by promoting data-driven decision-making, advocating for analytics across all levels of the organisation, and formalising experimentation through programs like ACE, which encourage learning from both successes and failures. These integrated actions build an environment where analytics can thrive, bridging the gap between strategy and execution while driving long-term business value.

Topic	Explanation	Theme
(S4T2) Technological Transformation in Trade Census	Show the strategic vision in revamping processes and encouraging the adoption of new technologies like AI and mobile apps.	Strategic Vision and Innovation
(S5T1) Organisational Transformation		
(S6T5) Formalizing Innovation Initiatives (ACE)	Underscore the dedication to fostering a culture of innovation and learning within the organisation, essential traits of a strategist leader.	
(S6T4) Experimentation and Learning		
(S5T8) Data Tribe Initiative	Describes the creation of a cross-functional group aimed at promoting analytical thinking and solution development, which is a key aspect of strategic vision and innovation.	
(S6T1) Adaptability and Innovation	Highlights the leader’s personal inclination towards frequently changing processes and exploring new approaches, demonstrating a commitment to continual improvement and innovation. This exemplifies the strategic vision necessary to anticipate and respond to evolving business and technological landscapes.	Advocacy and Evangelizing for Data-Driven Culture
(S7T2) Advocacy for Data-Driven Decision Making	Illustrate the leader’s role in promoting and demonstrating the value of data-driven decisions, aligning with the strategist’s trait of encouraging innovative thinking.	
(S7T5) Impact of Internal Evangelizing on Project Success		
(S1T2) Profile Raising in the D&A Community	Show efforts to elevate the organisation’s reputation in the analytics community, further fostering a data-centric culture.	
(S1T4) Participation in Industry Events		
(S3T2) Optimism vs. Reality in Analytics Predictions	Highlights the critical need for realism in the expectations from data-driven initiatives, a key area where advocacy for grounded, data-driven approaches is necessary.	
(S9T1) AME D&A Strategy	Focuses on creating actionable business value through data analytics, which directly relates to promoting a data-driven culture within the organisation.	
(S11T3) Challenge and Opportunity Recognition	Shows the leader’s proactive stance in challenging the status quo and identifying new opportunities, vital for strategic leaders aiming to promote necessary changes.	Leadership in Driving Change
(S9T8) Leadership and Strategy Adherence	Emphasizes the importance of strong leadership and strategic consistency even when faced with adversity, a core aspect of the strategist archetype.	

Topic	Explanation	Theme
(S12T5) Empowering Teams with New Tools and Technologies	Shows leadership in action, guiding teams to embrace new technologies and processes, indicative of driving change.	
(S7T1) Implementation of AI Award	Highlight the successful outcomes and external recognition of the innovative strategies implemented under the leader's guidance, aligning with the strategist leader's enthusiasm for technical innovations. Further validates the impact of these innovations on organisational performance.	Recognition and Impact of Innovations
(S10T2) External Validation and Awards		
(S3T6) Achieving and Exceeding Targets		
(S9T6) Relevance of Consumer Data in Different Regions		
(S9T3) Global Data Collection Initiatives	Reflects the strategic implementation of data collection methods that adapt to new regulations, like the restriction on cookies. This initiative is innovative in its approach to gathering consumer insights globally, emphasizing the practical impact of such innovations.	

Table 18: 'Strategist/Change Behaviour' Topic to Theme Mapping

Bridging the Analytics Strategy-Execution Gap: Concluding Remarks

Detailing an in-depth introspection of an analytics leader's ten-year journey within a traditional organisation undergoing a digital transformation provides a number of contributions to practice and research.

Understanding the Role of an Analytics Leader

This study conceptualizes the role of an analytics leader beyond that of a Chief Data/Analytics Officer (CDAO), which has dominated analytical leadership discussion in practitioner and academic forums. An analytics leader in the context of this research is one who is responsible for the design, communication, implementation, and monitoring of an analytics strategy that has an overarching goal of developing a data-driven organisation. While this is squarely within the remit of a CDAO, our research demonstrates it is not exclusive to the executive role, given the influence and impact of the lead author over a ten-year period. This may lessen the emphasis on bearing the responsibility of a successful analytics strategy implementation on a CDAO, to focusing on acquiring and nurturing analytical leadership in the context of a traditional organisation.

Furthermore, the study details the leadership profile of an analytics leader bridging the strategy-execution gap in a traditional organisation. In particular, four thematic leadership characteristics are identified and include (i) *“build skills, drive insights, foster innovation”*, (ii) *“empower teams, foster collaboration, achieve impact”*, (iii) *“drive culture, adapt strategy, integrate technology”*, and (iv) *“lead innovation, advocate data, drive change”*. It could be argued that such actions are not new and too generic to provide value to analytics leaders. However, the uniqueness of this study is its holistic approach to understanding how each element of our model is packaged within one analytics leader over a 10-year period. The holistic multi-faceted scope of the analytics leader remit is a significant contribution and challenges the often-found concept of analytics leaders (from technical backgrounds) who focus on the delivery of analytics solutions without the experience, expertise or inclination to focus on the strategic transformative aspects of our proposed remit.

We are also conscious of guidance for practitioners that asks them to be all things to everybody. However, the very essence and pragmatic nature of the study demonstrates that all these insights were actualised and can be traced back to the story where they were instantiated. While this can be seen as an academic chain of evidence, it provides a detailed introspective map for practitioners to find out how they can enact the leadership themes identified and enable practitioners to become more effective analytics leaders. Furthermore, at the level of our model (see Figure 29) we detail the intersection of leader behaviours and leader archetypes. While more abstracted, it still provides an understanding of analytics leadership. For instance, the model details how the analytics leader is only an 'Analytical Thinker' when it comes to tasks. Indeed, each of these thematic leadership taglines underscore a critical aspect of the role and goals of an analytics leader, making it a succinct and comprehensive statement of their strategic focus areas. The practical implications of these four thematic leadership taglines better conceptualise the remit of an analytics leader, looking to bridge the analytics strategy-execution gap within a traditional organisation.

The tagline “*build skills, drive insights, foster innovation*” captures the essence of the practical implications for an analytics leader. For example, *build skills* emphasises the importance of strategic planning and execution, particularly the focus on recruitment, development programmes, and building a skilled Data & Analytics (D&A) team. The significant skills shortages in the D&A domain requires analytics leaders (more so than leaders in other fields not experiencing such a shortage) to adopt a forward looking, flexible and creative approach to distinguish themselves from and build a solid pipeline of D&A talent while finds their organisation appealing. It also reflects the effort to establish a solid foundation of data literacy and expertise within a traditional organisation. This is particularly critical as more than some of the more technical Digital & Technology disciplines, D&A is a team sport and success is dependent on the contributions of business stakeholders from across the organisation's various functions. Furthermore, *drive insights* aligns with operational excellence and performance monitoring, highlighting the use of robust data management practices and systems (like dashboards) that provide real-time insights. It suggests the proactive use of data to make informed decisions, bridging the gap between strategy and execution. In

the experience of the lead author this is an often overlooked but critical aspect of leading data driven transformations in organisations. While analytics leaders may advocate the use of data-driven decision making and the analytics tools provided by the D&A teams amongst the business stakeholders, they don't always adopt a similarly robust data-driven approach to their own operations. Finally, *foster innovation* encapsulates the emphasis on innovation and technological advancement. Given the speed of technological analytics advancement, this creates a need for continuous exploration and implementation of new technologies and methodologies, like GenAI and machine learning, to not only solve complex problems but also to propel the organisation towards a more innovative and agile future.

The tagline “*empower teams, foster collaboration, achieve impact*” captures the core of the practical implications for an analytics leader. For example, *empower teams* highlights the importance of providing robust training programmes and hands-on projects that not only build skills but also empower team members to execute analytics strategies effectively. This underscores the initiative to not only develop technical competencies within the team, but also ensure that D&A teams are equipped with the competencies to fulfil their rapidly changing roles as necessitated by the changing analytics landscape, such as the move to cloud infrastructure and the democratization of BI (e.g. PowerBI) and GenAI (e.g. OpenAI). Furthermore, given that analytics is a team sport *foster collaboration* promotes how cross-functional teams and systematic recognition programmes supports a collaborative culture that values and leverages diverse insights and celebrates shared successes. This encourages a harmonious work environment where collaborative efforts align with strategic objectives. Finally, *achieve impact* emphasises the end goal of making strategic, data-driven decisions that align with business objectives and demonstrate clear business value, all while maintaining team focus and productivity amidst challenges. With less than half of D&A teams delivering value for their organisations (Gartner, 2023), it is critical that D&A teams identify and focus on initiatives which deliver real impact and not just develop ‘nice’ analytics solutions. It suggests that through these practices, a traditional organisation can see tangible results from its analytics efforts.

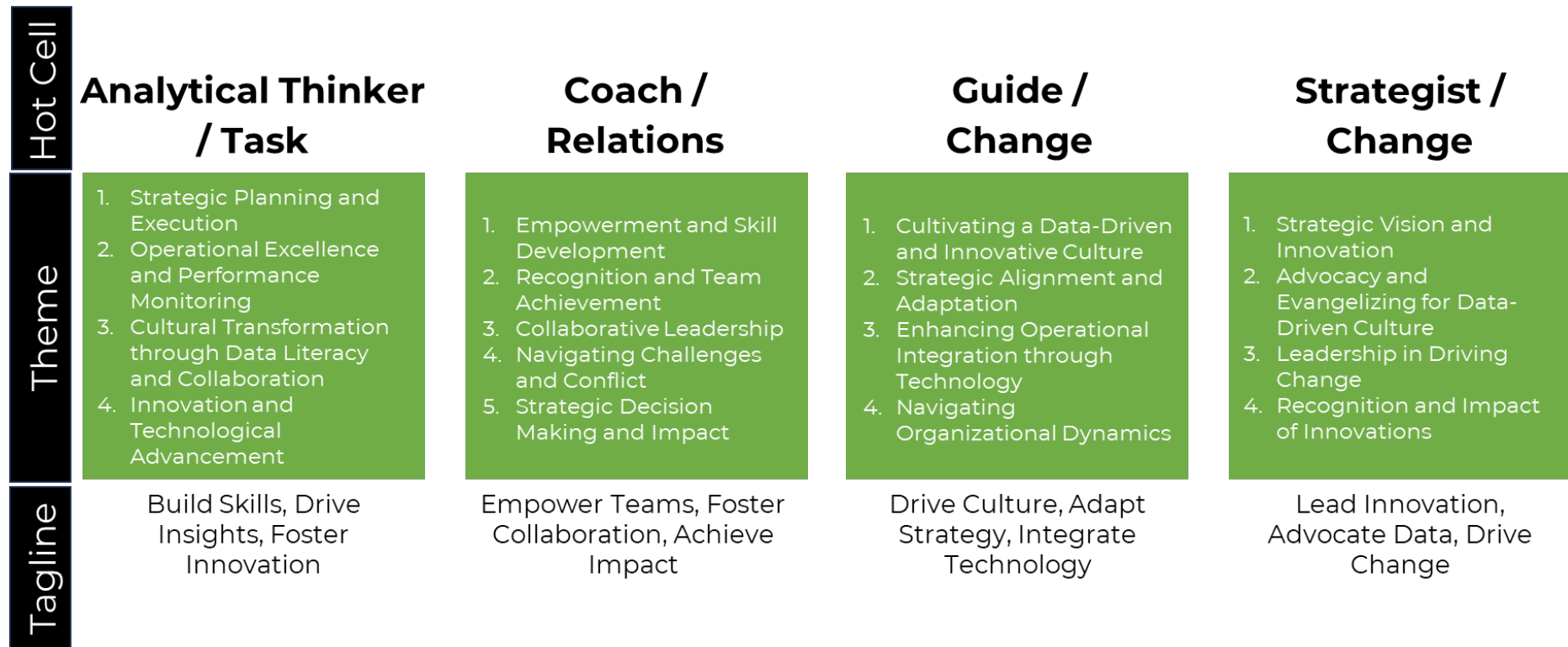


Figure 29: Analytics Leadership Model

The tagline “*drive culture, adapt strategy, integrate technology*” captures the key practical implications for an analytics leader. For example, *drive culture* emphasises the importance of fostering an environment that encourages experimentation, learning, and cross-functional collaboration. While almost all organisations use technology for their business operations such as ERP, e-commerce, or warehouse management systems, and even long-established traditional organisations have experience with digitising business processes, a successful data-driven transformation calls for even more intentional organisational change management. This is because analytics goes beyond technology and business processes and requires a deep organisational culture change as it requires people across the organisation to change from the established intuition-driven culture of decision making to a data-driven or data-informed culture of decision making. The focus here is on making analytics a fundamental part of the organisational ethos, which is critical for ensuring that the strategy is embraced and executed effectively by all parts of the traditional organisation. Furthermore, *adapt strategy* captures the need for continuous monitoring and flexible adjustment of analytics strategies to stay aligned with external market dynamics and internal capabilities. This adaptation is crucial for maintaining organisational agility and ensuring that the analytics initiatives remain relevant and effective in achieving strategic goals. Finally, *integrate technology* highlights the crucial role of technology in operationalising analytics strategies. This involves not only deploying new technologies but also ensuring they are effectively utilised across departments to bridge the gap between strategic planning and practical execution on the ground.

The tagline “*lead innovation, advocate data, drive change*” summaries the core practical implications for an analytics leader. This tagline distils the analytics leader’s role into a powerful, action-oriented statement that encapsulates their dual focus on technological and cultural transformation within the organisation. For example, *lead innovation* highlights the leader's role in pushing the boundaries of current technology and strategic thinking, integrating advanced tools like GenAI and machine learning. This leadership in innovation is crucial for maintaining a competitive edge and adapting to new market conditions. Furthermore, *advocate data* emphasises the analytics leader’s responsibility to promote the importance and utility of data-driven decision-making

across the traditional organisation. It's about fostering a culture where data is not just available but is a central pillar in the decision-making process, helping to shift from intuition-based to data-informed strategies. Finally, *drive change* underscores the proactive role an analytics leader must take in instigating and managing change within a traditional organisation, whether through leadership practices, organisational restructuring, or celebrating and building on successes. It reflects the dynamic and influential role a leader plays in transforming business practices and mindsets to be more analytics-focused.

Insights for Reflective Practitioners and Personally Relevant Research

The study presents a detailed process of practitioner reflection that resulted in a thematic awareness of how an analytics leader bridged the analytics strategy-execution gap in a traditional organisation. While the themes themselves provide guidance through a comparative benchmark of actions for analytics leaders in similar situations, an implied takeaway is the need to critically reflect on past strategy-execution actions (reflection-on-action) while in the continuous process of strategic sensemaking and implementation (reflection-in-action). Indeed, many of the stories themselves highlight a strong ability to conduct reflection-in-action and deal with the surprises of being an analytics leader. However, the HITL process detailed in this study provides guidance on how to engage in conversations with one's own materials, how to ask fundamental questions of an analytics leader's performance, being alert to spontaneous signals that are often not captured in formal feedback, and responding through improvisation (Yanow & Tsoukas, 2009).

Furthermore, this research fits the definition of personally relevant research, which describes "*research that addresses questions in which scholars are personally invested or that involves a population to which they belong or in which they hold a personal interest*" (Jones & Bartunek, 2021, p. 335). A key element of personally relevant research is envisioning objectivity as responsibility. Responsibility to the judgements they make in the course of the research process, responsibility to those that are linked to the research, and those that are impacted by the outputs (Heldke & Kellert, 1995; Jones & Bartunek, 2021). It is worth considering the context of this research to understand the

responsibility and objectivity enacted in the study. Firstly, this research is a named study with the lead author an employee of the organisation. Secondly, the judgement to use Generative AI (ChatGPT4) was made with a responsibility and objectivity centrality.

Reflecting on the 2024 ISJ editorial titled *“the ethics of using Generative AI for qualitative data analysis”* we believe that we have designed our abductive HITL grounded theorising approach to adhere to ethical practices. In this research, the lead author represents the organisation that provides the context for their analytics leadership stories, and they are committed to doing *“no harm”* to their reputation, that of their organisation, or its employees (c.f. Davison et al., 2024, p. 1434). Through sharing their stories, the analytics leader is letting the research community into their world. Given the position of the lead author and their ongoing reflective practices (throughout their 10-year tenure as an analytics leader in HEINEKEN), the use of ChatGPT4 (in our abductive HITL grounded theorising approach) is viewed as augmenting these practices, and not replacing them (c.f. Sammon et al., 2024b). The lead author is *“living the experience”* in the *“trenches”* (McCarthy et al., 2024, p. 412) and is very much aware of the *“nuances of the research environment”* (Davison et al., 2024, p. 1434).

In addition, the lead author has continuously practiced *“manual data analysis”* (Davison et al., 2024, p. 1435) and has also published these coded outputs in the recent past (c.f. O’Driscoll et al., 2024). Furthermore, within our abductive HITL grounded theorising approach we also showcase our *“creative and conceptual ability to discern meaning, salience and interconnectedness of logic in emerging themes”* (Davison et al., 2024, p. 1435). For example, as highlighted in Figure 14 our move from ***messy*** to ***matrix*** to ***model*** provides a transparent insight into our approach, specifically, the decreasing use of ChatGPT4 and the continuous evaluation of the emerging outputs (by the lead author specifically and the research team more generally). Finally, in this research, the lead author is themselves a practitioner, who stands over the outputs, therefore, it is unlikely that these *“research outcomes might be seen by practitioners with scepticism”* (Davison et al., 2024, p. 1437).

References

References are consolidated in References section.

Chapter 6 CONCLUSION

Introduction

In this chapter I synthesise the key findings and contributions of my research, which centres on the development of organisational Business Analytics (BA) capabilities, particularly within large, traditional organisations. Throughout the thesis, the analogy of ‘Baking the Cake’ has served as an accessible yet insightful conceptual framework to explain the intricate dynamics of BA transformations. In the following sections, I discuss the contributions of this research starting with the ‘Bake the Cake’ analogy itself followed by the role of BA leadership (the Baker), the BAR framework for capability-building (the Recipe), and the organisational context in which the transformation occurs (the Bakery). I then outline the additional overarching contribution in the form of the Decision Dynamics Matrix, which provides a structured lens for understanding the evolution of decision-making practices from gut-driven to data-driven. I also include a reflection on the limitations of the study, and offer recommendations for future work, before concluding with a summary of the key contributions to both theory and practice.

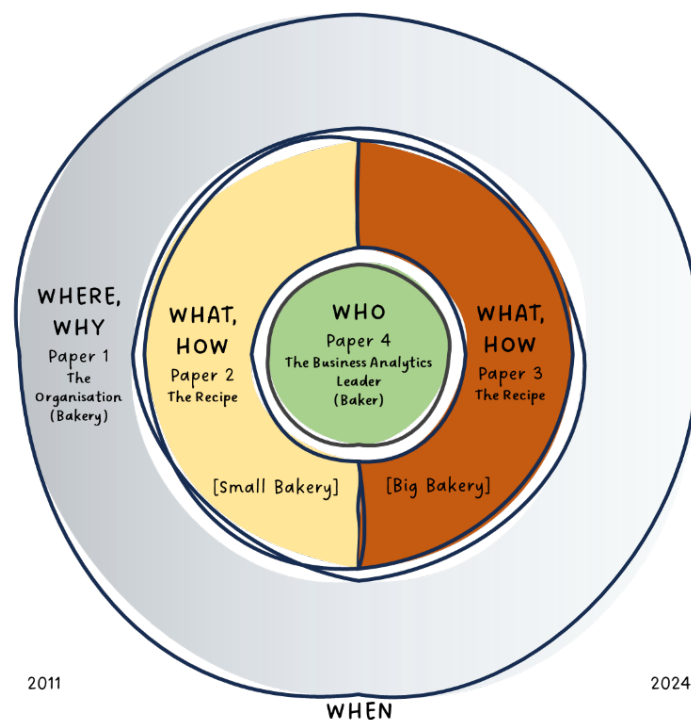


Figure 30: Structure of Thesis

Research Objectives

This thesis was driven by the following research objectives:

1. **To explore and articulate the role of the Business Analytics (BA) leader** in driving organisational data-driven transformation and to identify the key leadership competencies and strategies necessary for success.
2. **To develop a holistic framework for building an organisational BA capability**, identifying critical success factors, enablers, and barriers, while providing practical tools for BA implementation.
3. **To examine the organisational structures, processes, and cultural factors** that influence the successful adoption and integration of BA capabilities.
4. **To assess the impact of the BA capability-building journey** in fostering cultural transformation, delivering measurable business performance, and driving the progression of decision-making practices from gut-driven to data-driven.

Contributions

Throughout this thesis I have utilised the ‘Bake the Cake’ analogy and structured the thesis on that basis, so it is only logical that I frame my contributions accordingly. In the following sections, I call out the contributions to theory and practice as they relate to the Baker, the Recipe, and the Bakery, before bringing it all together with an overarching contribution in the form of the Decision Dynamics Matrix. However, before doing so, I believe it is worth considering the contribution presented by the analogy itself, particularly given its applicability and relevance in the context of organisational BA capability.

Bake the Cake Analogy

The ‘Bake the Cake’ analogy is an innovative way to simplify the complex concepts and processes involved in business analytics, and I have been using it for almost ten years in several contexts to effectively communicate how organisations build a BA capability. Analogies are widespread in organisational theory as an effective way of communicating and helping people to understand complex and novel concepts

(Ketokivi et al., 2017; Kumar et al., 2014; Leuzzi & Ferilli, 2017). Exploring parallels between new and previously encountered concepts, allows people to effectively form an understanding of the novel concept with such mental ease that they are often unaware of the analogical process (Barbot et al., 2019; Mitchell, 2023).

The first time I used the ‘Bake the Cake’ analogy was to address a problem I was encountering explaining to the senior leadership team in HEINEKEN Ireland what was required to successfully develop a BA capability. I had noticed that senior leaders tended to view BA as like a technology investment such as implementing a new ERP or CRM system. In their minds the requirement was to buy the technology, train some super users and the return on investment would surely follow, as ‘the computer’ would magically tell them the right answers to all their questions. I’m oversimplifying it here, but my attempts at trying to explain that there was much more to it, such as the need for the right data of the right quality, new BA skills (which were different to someone who was good at excel), and the challenges of integrating the analytics outputs into business processes, were almost always met with glazed faces and deaf ears as non-technical business leaders struggled to understand the concept.

In 2015, I was preparing a presentation on BA for a class on the UCC/IMI MSc Data Business, and I was starting the presentation telling a personal story of how as a teenager I had set up a small duck farm (300 birds) which against the odds turned out to be quite successful. I attributed the success to the data-driven way in which I had managed the operation, hence the relevance to a presentation on BA. The farm had started with just two ducks to satisfy a domestic need for duck eggs in my mother’s home baking due to one of my family members being allergic to chicken eggs. Once I hit on the notion that data was the ingredient for BA, just like eggs, flour etc. were ingredients for cakes, the rest of the analogy quickly fell into place. Data technology was just like the baking utensils, the baking skills (which I don’t possess) like the skills of data scientists, BI developers, data engineers, etc. and crucially, in the same way as the value realisation from my mother’s baking only came when we ate the cakes, the value from BA was not from producing the dashboard / report / AI model, but only when a business user did something they would otherwise not have done as a result of the BA.

The reaction to the 'Bake the Cake' analogy during that first presentation (to approx. 20 executives from various organisations) was very positive so I refined it a little and started using it in HEINEKEN Ireland and I immediately saw a different reaction. Suddenly the senior leaders and peers 'got it' and were able to easily understand how the various initiatives such as data literacy training, re-engineering data processes, new technology, new governance processes were all connected and critical steps in becoming data driven. The key message from the 'Bake the Cake' analogy is that all elements are required. Just having a set of baking utensils without everything else does not result in a good cake, so I was able to get support for the holistic D&A strategy as called for by the BAR (Business Analytics Recipe).

The 'Bake the Cake' analogy has continued to receive very positive feedback in the intervening years, for both its simplicity and relevance to building BA capability. This includes academic settings such as executive education lectures with the Irish Management Institute, guest lectures to undergraduates and postgraduates in UCC, and presentations at several industry conferences. Perhaps the strongest validation came in early 2022 from the Finance Director in Nigerian Breweries (a HEINEKEN OpCo). I was still new in my AME role and along with a member of my team and the Global Analytics Capability Lead, we presented an Analytics Upskilling session to the Management Team of Nigerian Breweries, and I added into the presentation a section on the AME Data & Analytics strategy which was framed by the 'Bake the Cake Analogy' and the BAR. This OpCo is one of HEINEKEN's largest and Nigeria is a very challenging market, so the Management Team here is made up of highly experienced directors, who are at the top of their game. The upskilling programme developed by Global Analytics would have been a good fit for an average OpCo, but did not meet the expectations of such senior directors as those found in Nigerian Breweries. The Finance Director, whose reputation for toughness and abruptness had preceded him, did not hold back in his criticism of the upskilling programme at the end of the session before finishing his monologue with *"But I really liked the Cake Analogy"*.

Contribution to Theory

The 'Bake the Cake' analogy contributes to theoretical frameworks by conceptualising how BA strategies (the recipe) interact with organisational structures (the bakery) to produce effective business outcomes. This can help in understanding the dynamic interplay between BA strategy, organisation structure, and performance in business analytics.

The analogy further enhances the theoretical understanding of roles and jobs to be done within BA, specifically the role of leadership (the head baker) and BA teams in navigating and optimising the analytics process. This could enrich theories around leadership impact in data-driven decision-making environments.

'Bake the Cake' Contribution to Practice

As has been demonstrated in HEINEKEN, other practitioners can benefit from this analogy by gaining insights into structuring their BA teams and processes more effectively. The 'recipe' aspect of the analogy (the BAR) serves as a guide for developing robust BA strategies that are repeatable and scalable, much like following a baking recipe ensures consistent quality of cakes. Testament to the contribution of the BAR is that it has also been adopted by other regions in HEINEKEN to guide their BA strategy.

The analogy can also lead to better operational practices by emphasising the importance of adapting the 'bakery'—the business environment or organisational structure—to be more conducive to successful BA operations. This can involve rearranging teams, refining processes, or altering the corporate culture to create a better environment in support of analytics initiatives.

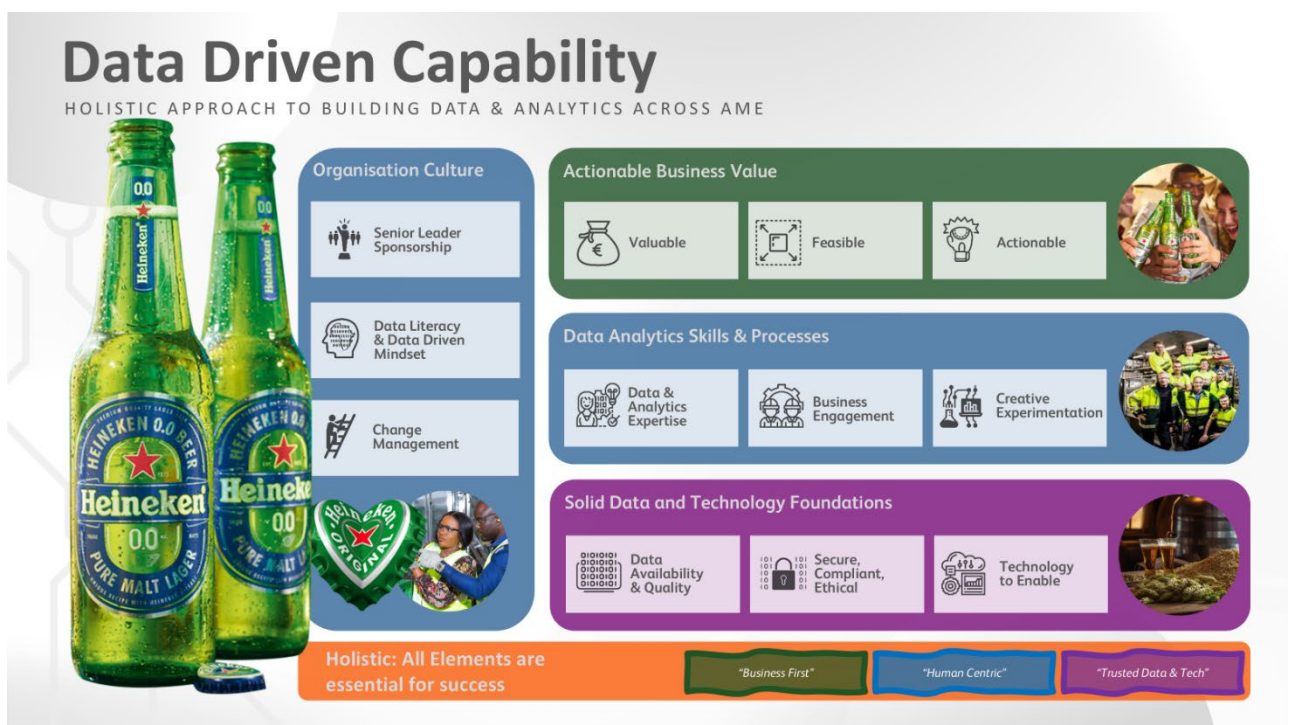
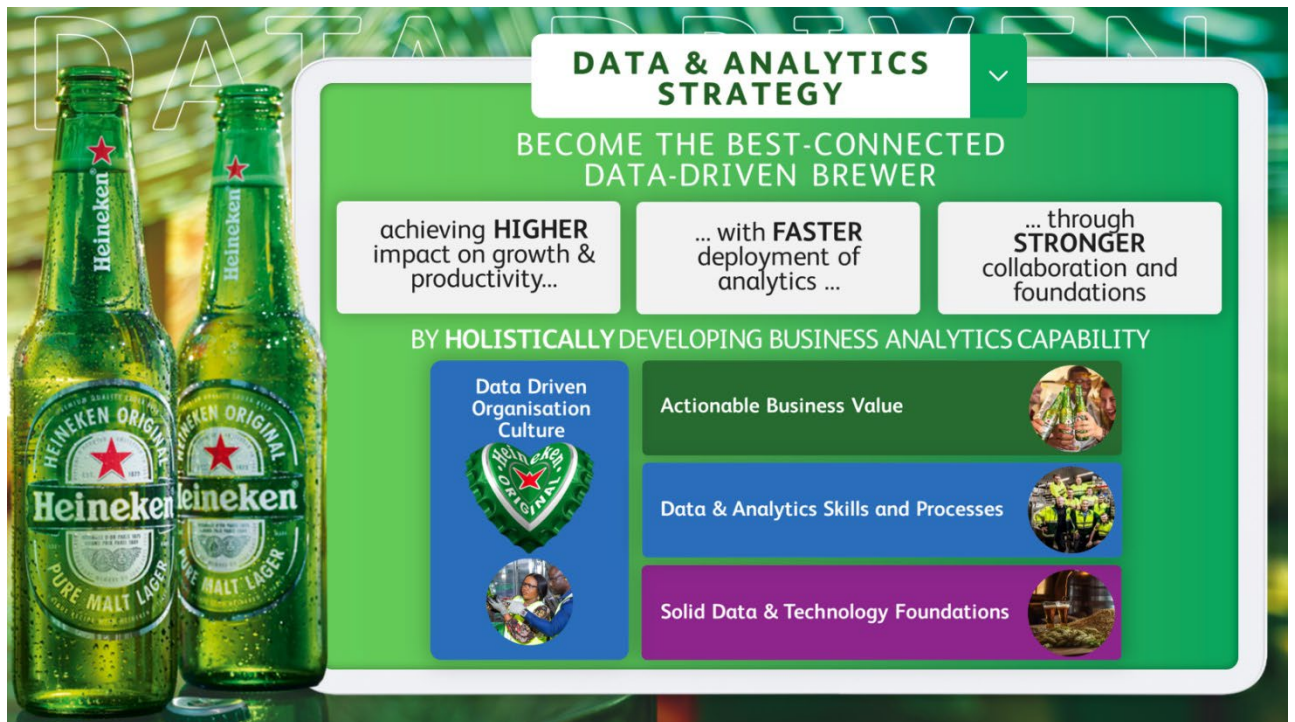


Figure 31: HEINEKEN AME Region Data & Analytics Strategy incorporating BAR

Baker

At the core of this thesis is the role of the BA Leader in driving the organisational data-driven transformation (see Figure 30: Structure of Thesis). In a similar way to how a baker needs to orchestrate the necessary resources in their bakery to produce the

perfect cake, BA leaders are tasked with executing the BA strategies through driving the analytics initiatives and guiding the rest of the organisation (Harris & Craig, 2012). The BA Leader is a critical component in the success of data-driven transformations and building the organisation's BA capability (Davenport & Harris, 2017; Someh et al., 2019). The role of the BA leader is of personal relevance to me as I am in the role myself, and I'm keen to understand how I can do better, and I am curious to understand what makes some BA leaders successful and others not so successful. In my current role in HEINEKEN, I am charged with the recruitment and leading of other BA leaders (in the OpCos across the AME Region) and I see a large disparity in the effectiveness of BA, despite all the BA leaders being provided with the same strategy (the BAR), resources (access to the Regional Data Management Hub and Analytics Hub teams) and similar organisational environments (OpCos).

While the role of the BA leader features to some extent across each of the papers that make up this thesis, Paper 4 specifically focuses on the role of the BA leader through following a three-stage abductive human in the loop grounded theorising approach. This study details how I, as a BA leader bridged the analytics strategy-execution gap and identified four thematic leadership characteristics of (i) "build skills, drive insights, foster innovation", (ii) "empower teams, foster collaboration, achieve impact", (iii) "drive culture, adapt strategy, integrate technology", and (iv) "lead innovation, advocate data, drive change".

Contribution to Theory

While traditional leadership theories offer valuable insights into leadership effectiveness across a wide range of organisational contexts, they typically treat leadership as a domain-general competency. In contrast, the BA leader operates at the intersection of data science, business strategy, and organisational change—requiring a blend of technical, relational, and visionary capabilities that may not be adequately addressed by traditional leadership models (Davenport et al., 2007; Vidgen et al., 2017). As organisations increasingly seek to embed data-driven decision-making into their core processes, there is a pressing need to understand how leadership is enacted in the distinctive domain of business analytics.

This thesis focuses on advancing the theoretical understanding of BA leadership by identifying and conceptualising the unique role, competencies, and influence of BA leaders within the organisation. The research demonstrates that BA leaders need to adopt a holistic leadership approach, combining transformational, situational, and technical leadership styles to guide their teams effectively and align the organisations BA capabilities with the business strategy. Furthermore, this research contributes to BA leadership theory by examining how BA leaders navigate and adapt to the dynamic interplay between rapidly evolving data technologies, organisational requirements, and the market environment. It highlights the importance of agility and continuous learning in BA leadership, revealing how BA leaders respond to the ever-changing environment to foster innovation and drive value creation. In doing so, this thesis enriches our understanding of how BA leadership behaviours, styles, and evolving competencies shape the success of an organisation's data-driven transformation.

Contribution to Practice

From a practical perspective, this thesis provides many practical insights for organisations seeking to enhance the effectiveness of their BA leadership roles. By defining the key competencies, responsibilities, and strategic value of BA leaders, this research serves as a guide for organisations to recruit, develop, and empower individuals who can drive the transformation from gut-based to data-Driven decision-making. The findings offer practical recommendations for BA leaders to navigate their remit effectively (see Figure 5 for an example of this research contribution to the

practitioner discussion), including strategies for managing cross-functional teams, fostering a data-driven culture, and aligning analytical initiatives with business objectives. Furthermore, the study highlights the organisational structures and support systems necessary to optimise the impact of BA leadership, enabling organisations to leverage BA capabilities as a source of competitive advantage in an increasingly data-centric world.

Recipe

Despite significant investments in BA technologies, many organisations still struggle to realise the full potential of their data due to fragmented processes, misaligned priorities, and lack of a cohesive BA strategy. The inner layer of this thesis looks at how organisations can successfully build their BA capability. In addition to guidance in the form of the BAR, Papers 2 & 3 also study the critical success factors for BA success and illustrate how the Data Value Map can be utilised to ensure alignment between the BA strategy and the teams executing the strategy. The Business Analytics Recipe (BAR) outlined in this thesis formed the basis of how I approached the BA capability building, not only the Ireland OpCo (where it was developed based on experience) but also at the regional level in AME, where it has also been proved to be effective. The key to the BAR is that it offers a holistic approach to BA, comprising four critical pillars of: *Actionable Business Value*, *Data Skills & Processes*, *Solid Data & Technology Foundation*, and a *Data-Driven Organisational Culture*. By emphasising both the technical and human dimensions of BA, the recipe helps guide BA leaders to overcome common challenges, such as insufficient skills, access to sufficient data, and resistance to change, while providing a roadmap for scaling BA initiatives. This holistic approach is essential for enabling organisations to unlock actionable insights, drive innovation, and create sustainable business value in an increasingly complex and data-rich environment.

Contribution to Theory

This thesis advances the theoretical understanding of how organisations build BA capabilities by presenting a holistic framework—the Business Analytics Recipe—which integrates four critical pillars: *Actionable Business Value*, *Data Skills & Processes*, *Solid Data & Technology Foundation*, and a *Data-Driven Organisational Culture*. Through the theoretical development of *the* new and refined BA framework, the research provides a

structured approach to implementing BA processes that bridge the gap between business strategy, operations, and technology. Furthermore, the research contributes to theory by examining how innovative BA strategies propagate within and across organisations, identifying the enablers and barriers that influence their adoption. This thesis enriches the BA literature by offering an integrated, dynamic perspective on how the organisation's BA capabilities evolve, emphasising the critical interplay between technical data infrastructure, human capital, and organisational cultural transformation. Adopting a holistic approach and by addressing the interconnectedness of these pillars, the research provides fresh theoretical insights into BA capability-building and its role in driving innovation and value creation by transforming the organisation from gut-driven to data-driven.

Contribution to Practice

From a practical perspective, this thesis delivers actionable tools and insights for organisations to build, scale, and sustain their BA capabilities by leveraging the Business Analytics Recipe framework. By outlining the four pillars, this research identifies best practices for scalable analytics, offering guidelines and real-world examples of successful strategies that can be adapted not just in the beverage industry but can be applicable across industries and organisational (particularly traditional) contexts. An example of this in practice is the adoption of the BAR by the HEINEKEN Asia Pacific (APAC) Region as their Data & Analytics strategy (see Figure 32). In addition, the research illustrates BA maturity models that enable organisations to assess their current state of BA readiness, identify gaps, and prioritise targeted improvements to achieve greater maturity and impact. Along with the BAR, the practical tools such as the critical success factors in Paper 2 or the Data Value Map analysis in Paper 3, equip leaders and practitioners with a structured roadmap to align their BA investments with the organisation's strategic objectives, optimise resource allocation, and develop a culture of data-driven decision-making. By combining technical, strategic, and cultural considerations, this research supports organisations in transforming from gut-driven to data-driven by developing BA capabilities which are a scalable and sustainable source of competitive advantage.

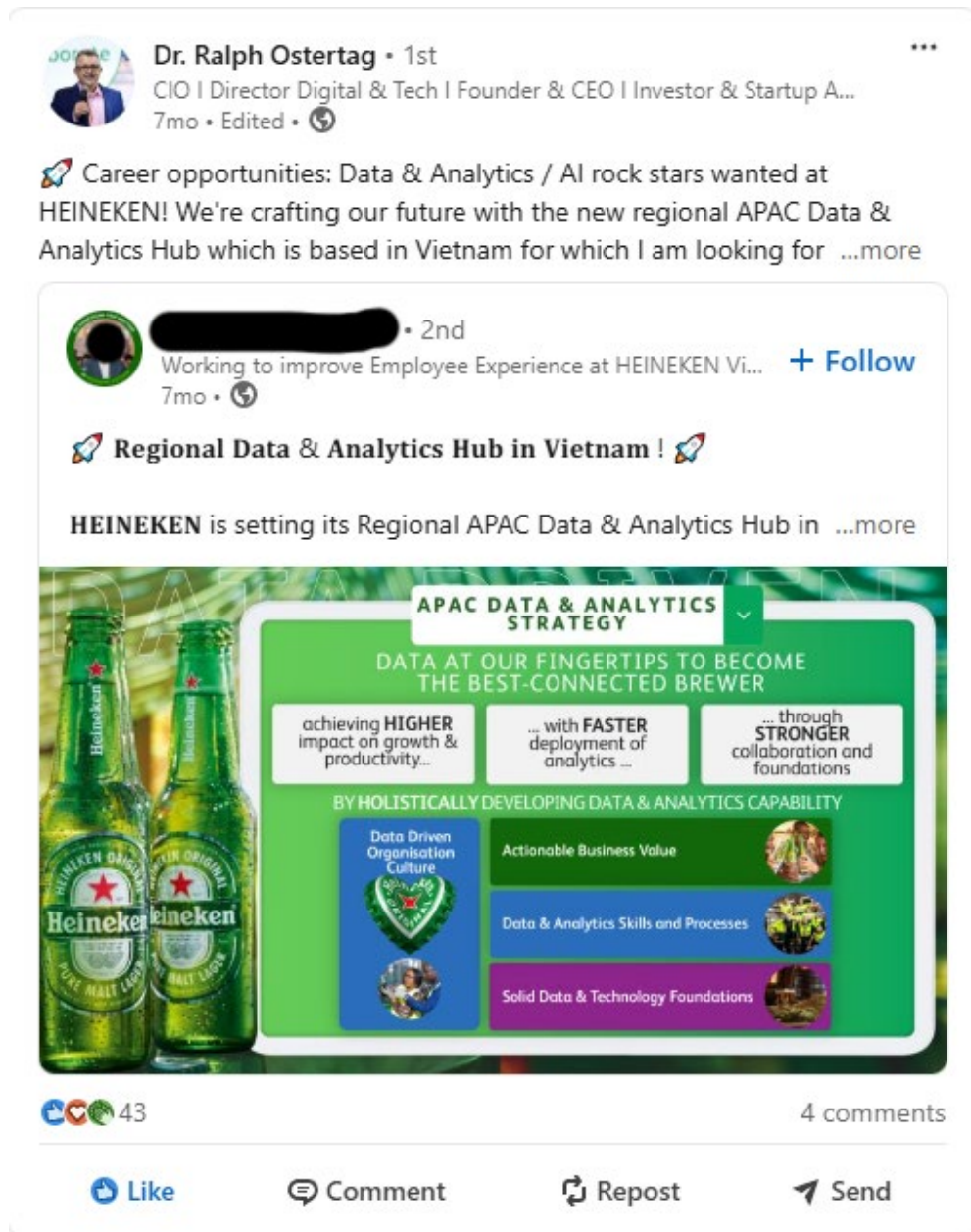


Figure 32: LinkedIn post from HEINEKEN APAC Digital & Technology Director in support of recruitment campaign, showing the APAC Data & Analytics strategy based on BAR

Bakery

The outer layer of this thesis focuses on the organisational context of the BA transformation. Paper 1 outlined the progression of organisational BA maturity in HEINEKEN Ireland through four eras of maturity and assessed the BA capability through the DELTA framework. While the BA leader is at the centre of this thesis, leading and guiding the actions as outlined in the inner layer, the ultimate intention is to effect the

change at the outer organisation layer and ensure that the organisation transforms to become data-driven.

Contribution to Theory

This research advances organisational theory by exploring how organisational structures, processes, and cultures influence an organisation's ability to build and leverage BA capabilities. The thesis highlights how factors such as BA leadership behaviours, team dynamics, and organisational norms can either facilitate or hinder the adoption of BA as a strategic capability. Furthermore, the research provides theoretical insights into strategic alignment, examining how organisations can integrate BA capabilities with the organisation's overarching business goals to ensure that data-driven initiatives are impactful and deliver measurable value. This contributes to existing strategy literature by demonstrating the importance of harmonising technical and cultural dimensions of BA transformation, offering a more holistic perspective on how organisations adapt and thrive in data-rich environments.

Contribution to Practice

From a practical perspective, this thesis provides actionable guidance for organisations seeking to structure their teams, processes, and technologies to optimise BA delivery. By addressing organisational design for BA, the thesis outlines strategies for developing cross-functional teams, establishing governance frameworks, and aligning data processes with business priorities to enable seamless collaboration and BA integration. Additionally, the research offers practical insights into change management, emphasising the importance of managing cultural and behavioural change to drive successful adoption of advanced analytics. This includes strategies for fostering leadership buy-in, overcoming resistance to change, and cultivating a data-driven mindset across the organisation. Together, these contributions provide a roadmap for leaders and practitioners to design adaptable and resilient organisational structures that support BA transformation, ensuring that organisations can unlock the full potential of their data assets while navigating the complexities of change.

An overview of the contributions to theory and contributions to practice of the four papers which make up this thesis is provided in Table 19 below.

Paper	'Bake the Cake' Element	Contribution to theory	Contribution to practice
Paper 1 - How a Traditional Organisation Matured a Business Analytics Capability	Bakery	Contributes to the theoretical understanding of how organisations mature their BA capabilities by providing a detailed examination of the HEINEKEN Ireland journey. By applying the DELTA model, this research highlights the dynamic, context-dependent nature of BA maturation.	Key watchouts be considered by BA leader practitioners in other similar organisations as they embark on their own journeys to become "Analytical Competitors".
Paper 2 - Bake the Cake: How a Traditional Organisation Delivers Impactful Analytics	Recipe (in Small Bakery)	Conceptualisation of the CSFs to deliver impactful BA in a traditional organisation. Advances understanding of BA maturity development by identifying not only the elements necessary for success but also the interactions between these elements, organised in the BAR (Business Analytics Recipe)	Puts forward 12 Critical Success Factors as a tool for practitioners to evaluate their respective efforts in delivering impactful BA by undertaking a self-assessment exercise on the presence or absence of the CSFs documented in the paper.
Paper 3 -Unpacking the 'Black Boxes' of Analytics: A Data Value Map Analysis	Recipe (in Big Bakery)	Contributes to organisational theory by providing a structured method to diagnose and address the gaps between D&A strategy and execution in a traditional organisation. Uncovers insight that execution gaps are not static but evolve with shifts in organisational capacity, reinforcing the need for flexible and adaptive strategies in BA transformations.	Offers a pragmatic approach for organisations struggling with the execution of their D&A strategies. By diagnosing the implementation gaps and adjusting the focus from scalability to feasibility, this research provides a roadmap for more effective and sustainable strategy execution.
Paper 4 - Bridging the Analytics Strategy-Execution Gap: An Analytics Leader's Story	Baker	Application of innovative abductive "human-in-the-loop" approach which contributes to the theoretical understanding of leadership in transformative BA environments and bridges the gap between BA leadership theory and practice, particularly on how leadership shapes and drives technological and cultural transformations in traditional organisations.	Practical guide for organisational leadership and BA leaders seeking to understand the role and remit of BA leadership to ensure that the right BA leadership is in place to deliver the organisation's data-driven transformation.

Table 19: Overview of Paper Contributions

Decision Dynamics Matrix

From Gut-Driven to Data-Driven

As I have previously discussed, it is critical for organisations to develop an effective Business Analytics (BA) capability to remain competitive and adaptable in today's rapidly evolving business environment. Organisations pursue BA capability building to facilitate data-driven decision making—the process of using data insights to guide actions and ultimately improve business performance. However, as found over the course of the research, this transformation is neither immediate nor linear. Building an organisational BA capability requires a holistic, multi-faceted approach, integrating Business Value, People & Processes, Data & Technology Foundations, and Organisational Culture & Mindset.

The impact of building BA capabilities often unfolds gradually. For example, implementing a new technology solution rarely delivers immediate benefits; these emerge only after the solution is integrated into business processes, widely adopted, and supported by a data-literate workforce. Likewise, when organisations transition from intuition-based to data-informed decision-making, decision-makers need time to build confidence in data-driven insights and sharpen their analytical competencies.

At its core, a data-driven organisation is one that optimises the use of data to maximize the effectiveness of business decisions. This does not imply a blind reliance on data; in many cases, the best outcomes emerge from the integration of BA insights with human intuition and experience—a phenomenon I define as data-informed decision making. While pure data-driven decisions may not always be feasible (due to cost, data limitations, or contextual complexity), the goal is to reach a point where data significantly influences decisions, even when it challenges gut instincts. This pattern of progression in the use of data for data decision making is something I have observed repeatedly amongst different groups of business stakeholders from different business functions in both my time in the Ireland OpCo and in the AME Region.

Progression from Gut to Data in practice

Several examples of the progression in the use of data for data decision making are included in this thesis, such as Story Ten: “You have Reached Your Destination” which

was analysed in Paper 4 (page 174 / full story page 257). A concise and discrete example which illustrates the progression from gut-based to data-driven decision making was the use of data for forecasting in HEINEKEN Ireland during the COVID-19 pandemic. While I normally observed business decision makers progressing from gut-driven to data-driven over a period of a few months or even years, in this example, (which featured in Paper 1 - see Era4: Leveraging, 2019 - 2020, page 73), the progression of key stakeholders such as the OpCo Managing Director, Commercial Director and Finance Director was much more rapid, taking place over a short period of only a few weeks.

In 2020 the COVID-19 pandemic impacted economies around the world and the Irish On-Trade market was completely closed for prolonged periods, which was unprecedented. Accurate sales forecasting had always been important for the purposes of effective production, operations and financial planning, but it became even more critical during the COVID-19 period as the market was suddenly much more unpredictable and key decisions needed to be taken, such as when to restart production, how many employees to retain, and how to manage cashflow. As this was impacting HEINEKEN on a global scale, HEINEKEN Ireland, along with all other OpCos was required to submit revised projections to Head Office on a monthly basis. Initially, in the absence of any datapoints, these projections were totally based on intuition and informed only by the opinions of others (such as consultants or looking at what the other OpCos around Europe were submitting). As new data sources and analysis were brought on stream, the projections were still based on intuition but now informed by some data. The BA Team then began deploying more advanced models to provide projections, but these projections tended to be significantly different to the senior leaders' intuition. While the BA was used as an input to inform, ultimately the intuition projections were the ones submitted to Head Office. After experiencing a few iterations of monthly forecasting, where the ever-improving BA was almost always much more accurate than their own intuition, the senior leaders began to submit the BA model forecasts – even when their own intuition disagreed significantly with the analytics outputs. This was a big shift and was difficult for the senior OpCo leaders because the Ireland projection tended to be very different from those of other similar OpCos such as

the UK. Therefore, the Ireland Senior Leaders were challenged hard by their superiors in Amsterdam on why their projections were so different. However, by the end of 2020, rather than being challenged HEINEKEN Ireland was being lauded for its superior forecasting accuracy and in-depth understanding of the local market in such an uncertain environment.

The Decision Dynamics Matrix

Based on my learnings and observations throughout the entire course of this research, I developed the **Decision Dynamics Matrix** to better understand and articulate the progression of decision-making behaviours within the organisation. This matrix (as can be seen in Figure 33) highlights four types of actions decision-makers may take based on the interplay between their intuition (gut feeling) and data-driven insights:

1. Forced Actions

Forced actions occur when decisions are imposed on the decision-maker, irrespective of both data insights and gut feeling. These typically arise due to external factors such as legislation, regulatory compliance, or organisational mandates. While necessary, such decisions do not reflect an organisation's analytical maturity.

Covid-19 Forecasting Example: While not directly comparable, submitting a zero forecast when the market is closed due to governmental order.

2. Gut-Driven Actions

Gut-driven actions occur when decision-makers prioritise their intuition over data. While there may be valid reasons for this—such as incomplete data, poor data quality, or mistrust in the analytics approach—it often reflects a reluctance to fully embrace data-driven decision making. In traditional organisations where intuition has historically delivered success, this behaviour can be particularly prevalent.

Covid-19 Forecasting Example: Early projections which used descriptive analytics, expert opinion and own experience to inform own opinion, but projections determined by intuition.

3. **Data-Informed Actions**

Data-informed actions represent an important step toward analytical maturity. Here, the decision-maker's intuition and the data insights align, providing validation and confidence to act faster, commit more to the decision (invest more), or fine-tune their actions. While these decisions may appear to confirm existing instincts, the presence of data accelerates decision-making and reduces uncertainty, thereby delivering measurable business value.

Covid-19 Forecasting Example: Using outputs of the analytics models to be more precise and have more confidence in the projections, which the senior leaders intuitively agreed with.

4. **Data-Driven Actions**

Data-driven actions reflect the pinnacle of analytical maturity, where decision-makers trust and act on data insights even when they challenge their gut instincts. This marks a fundamental shift in mindset and demonstrates true transformation to a data-driven organisation. It is in these moments—when data conflicts with intuition but prevails—that the greatest business impact can be realised.

Covid-19 Forecasting Example: Senior leaders submitting projections to Head Office, which they did not intuitively agree with or fully understand but had confidence in the analytics approach and in the knowledge that the analytics models had access to much greater quantities and more recent data than they personally had.

Action Taken based on Data or Gut Feel

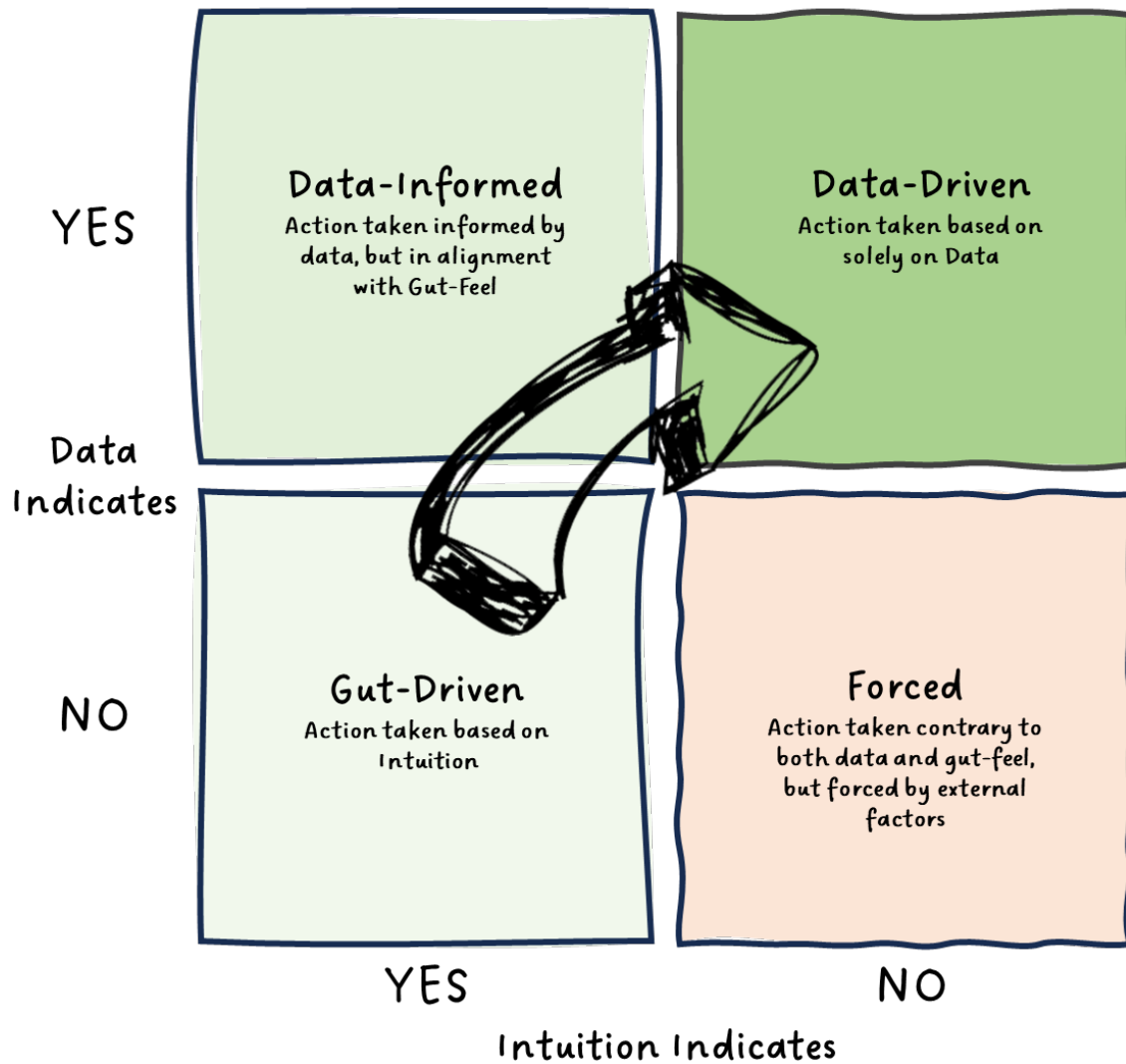


Figure 33: Decision Dynamics Matrix

The *Decision Dynamics Matrix* provides a conceptual framework to evaluate the maturity and effectiveness of an organisation's decision-making processes as it progresses toward data-driven decision making. It highlights the importance of *data-informed decision making* as a critical transitional phase, while positioning *data-driven decision making* as the ultimate goal.

The transitional journey from gut-driven to data-driven decision making (following the path of the arrow in Figure 33: Decision Dynamics Matrix), is something which I

consistently observed as the BA capability was matured in both the Ireland OpCo context and across the AME Region. As the BAR was brought to life and business decision makers were exposed to more data insights, they first became comfortable with data-informed decision making and then advanced into the realm of data-driven decision making. Rarely, if ever, did I observe a business decision maker move from predominately intuition decision making to embracing data-driven decision making.

Contribution to Theory

The introduction of the **Decision Dynamics Matrix** makes several contributions to theory:

1. Framework for Decision-Making Evolution

The matrix provides a structured model to analyse and categorise decision-making behaviours based on the interplay between intuition and data. This fills a gap in existing research, which often treats BA adoption as binary—data-driven versus not data-driven—without recognising the nuances of progression.

2. Bridging Human Intuition and Data Insights

By highlighting *data-informed decision making* as a critical transitional stage, the matrix advances our understanding of how organisations integrate human experience with data insights. This hybrid approach challenges the false dichotomy between gut-based and data-based decision making, providing a more realistic and actionable framework.

3. Linking Analytics Capability to Behavioural Outcomes

The matrix connects the development of organisational BA capabilities to observable changes in decision-making behaviours. This linkage enhances existing theoretical models of BA adoption by emphasising *behavioural transformation*—from gut-driven to data-driven—as the ultimate measure of success.

Contribution to Practice

The *Decision Dynamics Matrix* offers significant practical value for organisations striving to build BA capabilities and improve decision-making processes:

1. **Diagnostic Tool for Analytics Maturity**

Practitioners can use the matrix to assess their organisation's current decision-making behaviours and identify areas for improvement. By pinpointing where decisions fall within the four quadrants, leaders can evaluate progress and prioritise initiatives that drive movement toward data-driven decision making.

2. **Guidance for Change Management**

The matrix highlights the challenges of transitioning from gut-driven to data-driven decisions, emphasising the importance of *data-informed decision making* as a realistic and valuable intermediate step. This insight can guide change management strategies, helping leaders understand resistance to data insights and design targeted interventions to build trust and confidence in analytics.

3. **Benchmarking Success of BA Investments**

Organisations can use the matrix to measure the impact of BA capability-building efforts over time. Movement along the matrix—from forced and gut-driven actions to data-informed and ultimately data-driven actions—serves as a tangible indicator of progress.

4. **Promoting a Data-Driven Culture**

By articulating the conditions under which data and intuition interact, the matrix helps leaders foster a culture that values both human expertise and analytical rigor. It encourages decision-makers to view data not as a replacement for their judgment but as a powerful tool to enhance and refine their decisions.

This research has demonstrated that building a successful BA capability requires a holistic approach and a focus on behavioural change. The *Decision Dynamics Matrix* provides a robust framework to evaluate and accelerate this transformation.

Critically, this data-driven transformation does not happen uniformly across the organisation. Early adopters pave the way, but broad cultural change requires time, trust in data, and demonstrated success. By advancing the understanding of how analytics capabilities translate into behavioural outcomes, this research empowers organisations to unlock the full potential of data-driven decision making.

Ultimately, the impact of BA capability-building efforts must be evaluated by the degree to which an organisation progresses toward data-driven decisions. It is at this point—when decision-makers act on data despite their gut instincts—that organisations achieve meaningful, sustained improvements in business performance.

Limitations

While this research offers significant contributions, it is not without limitations. Firstly, the findings are derived from a single, in-depth case study of HEINEKEN, which, while rich in detail, limits the generalisability of the results to other organisations, particularly those operating in different industries or regions. Secondly, the research adopts an analytic auto-ethnographic research approach, which relies heavily on my own experiences as a BA leader. While this offers unique, practitioner-driven insights, it introduces the potential risk of bias. Additionally, the longitudinal nature of the study focuses on a specific timeframe (2011–2024), and the rapidly evolving technological and data landscape may introduce new future challenges and opportunities that were not captured. Lastly, while the Decision Dynamics Matrix provides a conceptual lens for evaluating decision-making evolution, its practical application and effectiveness in other organisational contexts require further empirical validation.

Recommendations for Future Work

Building on the contributions of this research, several avenues for future work are recommended to deepen and expand the findings. Specifically, there are opportunities to further develop the '*Bake the Cake*' analogy, further validate the Decision Dynamics Matrix, define metrics for data-driven transformation and address evolving challenges in business analytics (BA):

1. **Stretching the '*Bake the Cake*' Analogy:**

While the '*Bake the Cake*' analogy has proven to be a useful and accessible way of explaining the holistic requirements for building BA capability, future research

could refine and stretch the analogy to capture more advanced dimensions of BA.

- **Incorporating ‘Recipe Variations’:** As organisations operate in diverse industries and contexts, future work could explore how the BA ‘recipe’ might require adaptation for different levels of BA maturity, organisational cultures, or business challenges. For example, some organisations might need a ‘simplified recipe’ to establish foundational analytics, while others could explore ‘advanced recipes’ with more sophisticated elements.
- **Exploring ‘Baking at Scale’:** The analogy could be extended to address the scalability of BA. Notwithstanding that this research explored the scaling of the BAR from an individual OpCo (Ireland) to a regional context, future work might investigate how more diverse organisations can move from baking a “single cake” (small-scale analytics success) to operating a “bakery chain” where analytics practices and success are consistently scaled across multiple diverse business units, teams, or geographies.
- **The Role of ‘Ingredients Innovation’:** As analytics technologies and tools rapidly evolve, future research could study how organisations continuously innovate their “ingredients” (data sources, tools, and methods) to stay competitive. This might include emerging data trends like real-time streaming data, external data integration, or leveraging AI-powered analytics.

2. **Broader Empirical Validation of the *Decision Dynamics Matrix*:**

While the *Decision Dynamics Matrix* provides a theoretical framework for understanding decision-making evolution, future research should focus on validating its applicability across industries, organisational sizes, and cultural contexts. This could include:

- Testing the matrix in technology-driven startups, where decisions might more quickly evolve to *Data-Driven* due to agile structures.

- Exploring whether certain industries (e.g., finance, healthcare) experience unique challenges or accelerators in moving from gut-driven to data-driven decision-making.
- Longitudinal studies that track decision dynamics over extended periods to assess how organisations sustain and evolve data-driven practices amidst leadership changes or market disruptions.

3. **The Role of AI and Emerging Technologies in Decision Dynamics:**

Future work should investigate how Emerging Technologies such as GenAI, Machine Learning, and automation influence decision-making dynamics within organisations. Specifically:

- How can AI-powered decision support tools enhance or even replace certain stages in the *Decision Dynamics Matrix*? For example, will AI accelerate the shift from gut-driven to data-driven by offering robust, real-time recommendations that are easier to trust?
- How do organisations balance human intuition and AI recommendations, ensuring that trust in BA remains high while maintaining critical human oversight?

4. **Defining Metrics for Data-Driven Transformation Success:**

While this thesis identified twelve critical success factors (CSFs) for delivering impactful business analytics (BA) in a traditional organisation, future research should focus on defining and validating metrics to track progress against these factors in real time. As the transformation analysed in Paper 2 had already occurred, performance systems were not in place to measure these CSFs contemporaneously. Building on the hypothetical KPIs proposed in Table 12, future work can contribute by operationalising these indicators and assessing their effectiveness across diverse organisational settings. Doing so would enable BA leaders to better monitor, evaluate, and steer data-driven transformations in practice.

5. Long-Term Business Impact Measurement:

Future research should focus on developing robust methods to measure the sustained impact of BA on business performance. This could include frameworks for assessing ROI from data-driven initiatives, monitoring improvements in decision speed and quality, and evaluating cultural shifts toward data-driven mindsets.

By expanding the '*Bake the Cake*' analogy, investigating the impact of emerging technologies on BA adoption, and validating the *Decision Dynamics Matrix* across broader contexts, future work can extend the theoretical and practical contributions of this thesis. These areas provide exciting opportunities to enhance how organisations conceptualise, build, and sustain their BA capabilities while fostering engagement, innovation, and measurable value creation.

Summary

This research has advanced both theoretical understanding and practical knowledge of how organisations build and leverage Business Analytics (BA) capabilities to transform decision-making practices and improve business performance. At the core of this study lies the *Bake the Cake* analogy, which demystifies the BA transformation journey by emphasising the interplay between leadership (the Baker), strategic frameworks (the Recipe), and organisational context (the Bakery).

The introduction of the *Decision Dynamics Matrix* represents a critical overarching contribution, offering a structured way to understand and evaluate the progression from gut-driven to data-driven decision-making. By identifying four distinct decision types—*Forced*, *Gut-Driven*, *Data-Informed*, and *Data-Driven*—this matrix provides both a theoretical lens and a practical guide for organisations seeking to measure and accelerate their data-driven transformation.

Contributions to **theory** include advancements in BA leadership theory, BA capability-building frameworks, and organisational transformation literature. Contributions to **practice** provide actionable guidance for BA leaders, strategies for holistic BA capability-building, and practical tools for aligning data initiatives with business outcomes.

Ultimately, this thesis underscores that the journey to becoming a data-driven organisation is iterative and multi-faceted. Success requires not only technical investments but also leadership excellence, cultural transformation, and organisational adaptability. By providing both a conceptual understanding and practical tools, this research equips organisations and other BA leaders with the insights needed to unlock the full potential of their BA capabilities and thrive in an increasingly data-driven world.

REFERENCES

- Adams, T. E., Ellis, C., & Jones, S. H. (2017). Autoethnography. *The international encyclopedia of communication research methods*, 1-11.
- Akhtar, P., Frynas, J. G., Mellahi, K., & Ullah, S. (2019). Big Data-Savvy Teams' Skills, Big Data-Driven Actions and Business Performance. *British journal of management*, 30(2), 252-271. <https://doi.org/10.1111/1467-8551.12333>
- Alharahsheh, H. H., & Pius, A. (2020). A review of key paradigms: Positivism VS interpretivism. *Global Academic Journal of Humanities and Social Sciences*, 2(3), 39-43.
- Alhassan, I., Sammon, D., & Daly, M. (2019). Critical success factors for data governance: a telecommunications case study. *Journal of decision systems*, 28(1), 41-61. <https://doi.org/10.1080/12460125.2019.1633226>
- Alyami, A., Sammon, D., Neville, K., & Mahony, C. (2023). The critical success factors for Security Education, Training and Awareness (SETA) program effectiveness: a lifecycle model. *Information technology & people (West Linn, Or.)*, 36(8), 94-125. <https://doi.org/10.1108/ITP-07-2022-0515>
- Amankwah-Amoah, J., Abdalla, S., Mogaji, E., Elbanna, A., & Dwivedi, Y. K. (2024). The impending disruption of creative industries by generative AI: Opportunities, challenges, and research agenda. *International journal of information management*, 79, 102759. <https://doi.org/10.1016/j.ijinfomgt.2024.102759>
- Anderson, L. (2006). Analytic Autoethnography. *Journal of contemporary ethnography*, 35(4), 373-395. <https://doi.org/10.1177/0891241605280449>
- Angevine, C., Keomany, J., Thomsen, J., & Zimmel, R. (2021). Implementing a digital transformation at industrial companies. *McKinsey Insights*. <https://go.exlibris.link/bDDx2nqr>
- Baecker, J., Böttcher, T. P., & Weking, J. (2021). How Companies Create Value From Data—A Taxonomy on Data, Approaches, and Resulting Business Value. *ECIS 2021 Research Papers*, 124.
- Baesens, B., Bapna, R., Marsden, J. R., Vanthienen, J., & Zhao, J. L. (2016). Transformational Issues of Big Data and Analytics in Networked Business. *MIS quarterly*, 40(4), 807-818. <https://doi.org/10.25300/MISQ/2016/40:4.03>
- Barbot, N., Miclet, L., & Prade, H. (2019). Analogy between concepts. *Artificial intelligence*, 275, 487-539. <https://doi.org/10.1016/j.artint.2019.06.008>
- Baskerville, R. L. (1999). Investigating information systems with action research. *Communications of the AIS*, 2(3es), 4.
- Baskerville, R. L., & Wood-Harper, A. T. (1996). A critical perspective on action research as a method for information systems research. *Journal of Information Technology*, 11(3), 235-246.
- Benavides, L., Khanam, R., Lovera-Perez, O., & Lefort, F. (2017). Playing catch-up in advanced analytics. *McKinsey Insights*. <https://go.exlibris.link/187QRMVg>
- Benbasat, I., Goldstein, D. K., & Mead, M. (1987). The Case Research Strategy in Studies of Information Systems. *MIS quarterly*, 11(3), 369-386. <https://doi.org/10.2307/248684>
- Berente, N., Seidel, S., & Safadi, H. (2019). Research Commentary—Data-Driven Computationally Intensive Theory Development. *Information systems research*, 30(1), 50-64. <https://doi.org/10.1287/isre.2018.0774>
- Birks, M., Hoare, K., & Mills, J. (2019). Grounded Theory: The FAQs. *International journal of qualitative methods*, 18. <https://doi.org/10.1177/1609406919882535>
- Bonchek, M. (2017). Is execution where good strategies go to die. *Harvard Business Review*, 7.
- Brown, T., & Katz, B. (2011). Change by Design. *The Journal of product innovation management*, 28(3), 381-383. <https://doi.org/10.1111/j.1540-5885.2011.00806.x>

- Bumblauskas, D., Nold, H., Bumblauskas, P., & Igou, A. (2017). Big data analytics: transforming data to action. *Business process management journal*, 23(3), 703-720. <https://doi.org/10.1108/BPMJ-03-2016-0056>
- Burla, L., Knierim, B., Barth, J., Liewald, K., Duetz, M., & Abel, T. (2008). From Text to Codings: Intercoder Reliability Assessment in Qualitative Content Analysis. *Nursing research (New York)*, 57(2), 113-117. <https://doi.org/10.1097/01.NNR.0000313482.33917.7d>
- Butler, T., & Fitzgerald, B. (1999). Unpacking the systems development process: an empirical application of the CSF concept in a research context. *The journal of strategic information systems*, 8(4), 351-371. [https://doi.org/10.1016/S0963-8687\(00\)00027-5](https://doi.org/10.1016/S0963-8687(00)00027-5)
- Campbell, D. T. (1955). The Informant in Quantitative Research. *The American journal of sociology*, 60(4), 339-342. <https://doi.org/10.1086/221565>
- Canon Moreno, J. M., & Van Maanen, J. (2017). Leading data analytics transformations [Doctoral dissertation].
- Cao, G., & Duan, Y. (2017). How do top- and bottom-performing companies differ in using business analytics? *Journal of enterprise information management*, 30(6), 874-892. <https://doi.org/10.1108/JEIM-04-2016-0080>
- Carillo, K. D. A. (2017). Let's stop trying to be "sexy" – preparing managers for the (big) data-driven business era. *Business process management journal*, 23(3), 598-622. <https://doi.org/10.1108/BPMJ-09-2016-0188>
- Carillo, K. D. A., Galy, N., Guthrie, C., & Vanhems, A. (2019). How to turn managers into data-driven decision makers: Measuring attitudes towards business analytics. *Business process management journal*, 25(3), 553-578. <https://doi.org/10.1108/BPMJ-11-2017-0331>
- Cecez-Kecmanovic, D., Kautz, K., Abrahall, R., University of New South, W., & University of, W. (2014). Reframing Success and Failure of Information Systems: A Performative Perspective. *MIS quarterly*, 38(2), 561-588. <https://doi.org/10.25300/MISQ/2014/38.2.11>
- Chen, L., & Nath, R. (2018). Business analytics maturity of firms: an examination of the relationships between managerial perception of IT, business analytics maturity and success. *Information systems management*, 35(1), 62-77. <https://doi.org/10.1080/10580530.2017.1416948>
- Chiasson, M., Germonprez, M., & Mathiassen, L. (2009). Pluralist action research: a review of the information systems literature [Article]. *Information Systems Journal*, 19(1), 31-54. <https://doi.org/10.1111/j.1365-2575.2008.00297.x>
- Chongwatpol, J. (2020). Operationalizing Design Thinking in Business Intelligence and Analytics Projects. *Decision sciences journal of innovative education*, 18(3), 409-434. <https://doi.org/10.1111/dsji.12217>
- Chowdhury, M. F. (2014). Interpretivism in aiding our understanding of the contemporary social world. *Open Journal of Philosophy*, 2014.
- Chuah, M.-H., & Wong, K.-L. (2011). A review of business intelligence and its maturity models. *African journal of business management*, 5(9), 3424-3428.
- Chun Tie, Y., Birks, M., & Francis, K. (2019). Grounded theory research: A design framework for novice researchers. *SAGE open medicine*, 7, 2050312118822927-2050312118822927. <https://doi.org/10.1177/2050312118822927>
- Collier, K. (2012). *Agile analytics: A value-driven approach to business intelligence and data warehousing*. Addison-Wesley.
- Cosic, R., Shanks, G., & Maynard, S. B. (2015). A business analytics capability framework. *Australasian Journal of Information Systems*, 19.
- Creswell, J. W., & Poth, C. N. (2016). *Qualitative inquiry and research design: Choosing among five approaches*. Sage publications.
- Daniel, D. R. (1961). Management Information Crisis. 39(5), 111. <https://go.exlibris.link/74Fc7thZ>

- Davenport, T. (2015). Why data storytelling is so important—and why we're so bad at it. *Deloitte Insights*. <https://www2.deloitte.com/us/en/insights/topics/analytics/data-driven-storytelling.html>
- Davenport, T. (2018). DELTA Plus Model & five stages of analytics maturity: A primer. *International Institute for Analytics*, 1-12.
- Davenport, T., Bean, R., & King, J. (2021). Why do chief data officers have such short tenures. *Harvard Business Review*(8).
- Davenport, T., & Harris, J. (2017). *Competing on analytics: Updated, with a new introduction: The new science of winning*. Harvard Business Press.
- Davenport, T. H. (2006). COMPETING ON ANALYTICS [Article]. *Harvard Business Review*, 84(1), 98-107.
- Davenport, T. H. (2013). Analytics 3.0 [Article]. *Harvard Business Review*, 91(12), 64-72.
- Davenport, T. H., Harris, J. G., Jones, G. L., Lemon, K. N., Norton, D., & McCallister, M. B. (2007). The Dark Side of Customer Analytics [Article]. *Harvard Business Review*, 85(5), 37-48.
- Davenport, T. H., & Redman, T. C. (2020). Digital transformation comes down to talent in 4 key areas. *Harvard Business Review*, 21.
- Davison, R. M., Chughtai, H., Nielsen, P., Marabelli, M., Iannacci, F., Offenbeek, M.,...Panteli, N. (2024). The ethics of using generative AI for qualitative data analysis. *Information systems journal (Oxford, England)*, 34(5), 1433-1439. <https://doi.org/10.1111/isj.12504>
- Delen, D., & Ram, S. (2018). Research challenges and opportunities in business analytics. *Journal of Business Analytics*, 1(1), 2-12.
- Eisenhardt, K. M. (1989). Building Theories from Case Study Research. *The Academy of Management review*, 14(4), 532-550. <https://doi.org/10.2307/258557>
- Ellis, C., Adams, T. E., & Bochner, A. P. (2011). Autoethnography: An Overview. *Forum, qualitative social research* U6 - ctx_ver=Z39.88-2004&ctx_enc=info:ofi/enc:UTF-8&rft_id=info:sid/summon.serialssolutions.com&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&rft.genre=article&rft.atitle=Autoethnography:+An+Overview&rft.jtitle=Forum,+qualitative+social+research&rft.au=Carolyn+Ellis&rft.au=Tony+E+Adams&rft.au=Arthur+P+Bochner&rft.date=2011-01-01&rft.pub=Freie+Universität+Berlin&rft.eissn=1438-5627&rft.volume=12&rft.issue=1&rft.externalDocID=2368071671¶mdict=en-US U7 - Journal Article, 12(1).
- Ellis, C. S., & Bochner, A. P. (2006). Analyzing Analytic Autoethnography: An Autopsy. *Journal of contemporary ethnography*, 35(4), 429-449. <https://doi.org/10.1177/0891241606286979>
- Evered, R., & Louis, M. R. (1981). Alternative Perspectives in the Organizational Sciences: "Inquiry from the inside" and "Inquiry from the outside". *The Academy of Management review*, 6(3), 385-395. <https://doi.org/10.2307/257374>
- Finlay, L. (2012). 'Writing the pain': engaging first-person phenomenological accounts. *Indo-Pacific Journal of Phenomenology*, 12(sup2), 1-9. <https://doi.org/https://doi.org/10.2989/IPJP.2012.12.1.5.1113>
- Flick, U. (2018). *Doing Grounded Theory*. SAGE Publications Ltd. <https://doi.org/10.4135/9781529716658>
- Galpin, T. J. (2023). The strategist's view needs to extend beyond planning to execution. *Strategy & leadership*, 51(4), 3-11. <https://doi.org/10.1108/SL-04-2023-0038>
- Gartner. (2023). *Gartner Survey Reveals Less Than Half of Data and Analytics Teams Effectively Provide Value to the Organization*. <https://www.gartner.com/en/newsroom/press-releases/03-21-2023-gartner-survey-reveals-less-than-half-of-data-and-analytics-teams-effectively-provide-value-to-the-organization>
- Gioia, D. A., Corley, K. G., & Hamilton, A. L. (2013). Seeking Qualitative Rigor in Inductive Research: Notes on the Gioia Methodology. *Organizational research methods*, 16(1), 15-31. <https://doi.org/10.1177/1094428112452151>

- Glaser, B. G. (2017). *Discovery of Grounded Theory: Strategies for Qualitative Research* (1;1st; ed.). Routledge. <https://doi.org/10.4324/9780203793206>
- Goldkuhl, G. (2012). Pragmatism vs interpretivism in qualitative information systems research. *European journal of information systems*, 21(2), 135-146.
- Goulding, C. (2005). Grounded theory, ethnography and phenomenology: A comparative analysis of three qualitative strategies for marketing research. *European journal of marketing*, 39(3/4), 294-308. <https://doi.org/10.1108/03090560510581782>
- Greene, J. C., Caracelli, V. J., & Graham, W. F. (1989). Toward a Conceptual Framework for Mixed-Method Evaluation Designs. *Educational evaluation and policy analysis*, 11(3), 255-274. <https://doi.org/10.2307/1163620>
- Grønsund, T., & Aanestad, M. (2020). Augmenting the algorithm: Emerging human-in-the-loop work configurations. *The journal of strategic information systems*, 29(2), 101614. <https://doi.org/10.1016/j.jsis.2020.101614>
- Gust, G., Flath, C. M., Brandt, T., Ströhle, P., & Neumann, D. (2017). How a Traditional Company Seeded New Analytics Capabilities. *MIS quarterly executive*, 16(3), 215-230.
- Halbardier, F., Henstorf, B., Levin, R., & Rosales, A. (2020). Solving the digital and analytics scale-up challenge in consumer goods. In: McKinsey & Company.
- Harris, J. G., & Craig, E. (2012). Developing analytical leadership. *Strategic HR review*, 11(1), 25-30. <https://doi.org/10.1108/14754391211186287>
- HEINEKEN. (2023). HEINEKEN N.V. Annual Report 2022. In. Amsterdam, The Netherlands: Heineken N.V. Global Corporate Affairs.
- Heldke, L. M., & Kellert, S. H. (1995). OBJECTIVITY AS RESPONSIBILITY. *Metaphilosophy*, 26(4), 360-378. <https://doi.org/10.1111/j.1467-9973.1995.tb00582.x>
- Hindle, G., Kunc, M., Mortensen, M., Oztekin, A., & Vidgen, R. (2020). Business analytics: Defining the field and identifying a research agenda. *European journal of operational research*, 281(3), 483-490. <https://doi.org/10.1016/j.ejor.2019.10.001>
- Janssen, M., & Borman, M. (2013). Similarities and Differences in Critical Success Factors across Context and Time: An Examination in the Setting of Shared Services. *E-service journal*, 9(1), 85-105. <https://doi.org/10.2979/eservicej.9.1.85>
- Jarvenpaa, S., Klein, S., University of, M., & University of Texas at, A. (2024). New Frontiers in Information Systems Theorizing: Human-gAI Collaboration. *Journal of the Association for Information Systems*, 25(1), 110-121. <https://doi.org/10.17705/1jais.00868>
- Jaspers, F. (2007). Case study research: Some other applications besides theory building. *Journal of purchasing and supply management*, 13(3), 210-212. <https://doi.org/10.1016/j.pursup.2007.09.012>
- Jenster, P. V. (1986). Firm Performance and Monitoring of Critical Success Factors in Different Strategic Contexts. *Journal of management information systems*, 3(3), 17-33. <https://doi.org/10.1080/07421222.1986.11517768>
- Jones, E. B., & Bartunek, J. M. (2021). TOO CLOSE OR OPTIMALLY POSITIONED? THE VALUE OF PERSONALLY RELEVANT RESEARCH. *Academy of Management perspectives*, 35(3), 335-346. <https://doi.org/10.5465/amp.2018.0009>
- Joshi, M. P., Su, N., Austin, R. D., & Sundaram, A. K. (2021). Why So Many Data Science Projects Fail to Deliver. *MIT Sloan management review*, 62(3), 85-89.
- Kenny, G. (2019). 5 Simple Rules for Strategy Execution. In: Harvard Business Review.
- Ketokivi, M., Mantere, S., & Cornelissen, J. (2017). Reasoning by Analogy and the Progress of Theory. *The Academy of Management review*, 42(4), 637-658. <https://doi.org/10.5465/amr.2015.0322>
- Kiron, D., Prentice, P. K., & Ferguson, R. B. (2014). The Analytics Mandate. *MIT Sloan management review*, 55(4), 1.
- Kiron, D., & Shockley, R. (2011). Creating Business Value with Analytics. *MIT Sloan Management Review*, 53(1), 57-63.

- Klee, S., Janson, A., & Leimeister, J. M. (2021). How Data Analytics Competencies Can Foster Business Value- A Systematic Review and Way Forward. *Information systems management*, 38(3), 200-217. <https://doi.org/10.1080/10580530.2021.1894515>
- Kock, N. (2004). The three threats of action research: a discussion of methodological antidotes in the context of an information systems study [Article]. *Decision Support Systems*, 37(2), 265-286. [https://doi.org/10.1016/s0167-9236\(03\)00022-8](https://doi.org/10.1016/s0167-9236(03)00022-8)
- Korherr, P., Kanbach, D. K., Kraus, S., & Mikalef, P. (2022). From intuitive to data-driven decision-making in digital transformation: A framework of prevalent managerial archetypes. *Digital business (Amsterdam)*, 2(2), 100045. <https://doi.org/10.1016/j.digbus.2022.100045>
- Kumar, V., Bhat, S., & Pedanekar, N. (2014, 2014). Familiarity breeds understanding Recommending explanatory analogies to learners. 2014 IEEE International Conference on Teaching, Assessment and Learning for Engineering (TALE), Wellington, New Zealand.
- Laney, D. B. (2018). *Infomatics*. Gartner Inc.
- LaValle, S., Hopkins, M. S., Lesser, E., Shockley, R., & Kruschwitz, N. (2010). Analytics: The new path to value. *MIT sloan management review*, 52(1), 1-25.
- LaValle, S., Lesser, E., Shockley, R., Hopkins, M. S., & Kruschwitz, N. (2011a). Big data, analytics and the path from insights to value. *MIT sloan management review*, 52(2), 21.
- LaValle, S., Lesser, E., Shockley, R., Hopkins, M. S., & Kruschwitz, N. (2011b). Big data, analytics and the path from insights to value. *Mit Sloan Management Review*, 52(2), 21-31.
- Le Roux, C. S. (2017). Exploring rigour in autoethnographic research. *International journal of social research methodology*, 20(2), 195-207. <https://doi.org/10.1080/13645579.2016.1140965>
- Leinwand, P., Mainardi, C., & Kleinter, A. (2015). Five ways to close the strategy-to-execution gap. *Harvard Business Review*, 22.
- Leuzzi, F., & Ferilli, S. (2017). A multi-strategy approach to structural analogy making. *Journal of intelligent information systems*, 50(1), 1-28. <https://doi.org/10.1007/s10844-017-0447-6>
- Lismont, J., Vanthienen, J., Baesens, B., & Lemahieu, W. (2017). Defining analytics maturity indicators: A survey approach. *International journal of information management*, 37(3), 114-124. <https://doi.org/10.1016/j.ijinfomgt.2016.12.003>
- Lo, D., Nagappan, N., & Zimmermann, T. (2015). How practitioners perceive the relevance of software engineering research. In *ESEC/FSE 2015: Proceedings of the 10th Joint Meeting on Foundations of Software Engineering* (pp. 415-425). Bergamo, Italy: ACM.
- Mankins, M. (2017). 5 ways the best companies close the strategy execution gap. *Harvard Business Review, Digital Articles*, 1-5.
- Markus, M. L., Rowe, F., Nantes, U., & Bentley, U. (2021). Guest Editorial: Theories of Digital Transformation: A Progress Report. *Journal of the Association for Information Systems*, 22(2), 273-280. <https://doi.org/10.17705/1jais.00661>
- Matavire, R., & Brown, I. (2013). Profiling grounded theory approaches in information systems research. *European journal of information systems*, 22(1), 119-129. <https://doi.org/10.1057/ejis.2011.35>
- McCarthy, P., Sammon, D., & Alhassan, I. (2022). 'Doing' digital transformation: theorising the practitioner voice. *Journal of decision systems, ahead-of-print(ahead-of-print)*, 1-21. <https://doi.org/10.1080/12460125.2022.2074650>
- McCarthy, P., Sammon, D., & Alhassan, I. (2024). The characteristics of digital transformation leadership: Theorizing the practitioner voice. *Business horizons*, 67(4), 411-423. <https://doi.org/10.1016/j.bushor.2024.03.005>
- McChesney, K., & Aldridge, J. (2019). Weaving an interpretivist stance throughout mixed methods research. *International journal of research & method in education*, 42(3), 225-238. <https://doi.org/10.1080/1743727X.2019.1590811>

- McIlveen, P. (2008). Autoethnography as a method for reflexive research and practice in vocational psychology. *Australian journal of career development*, 17(2), 13-20. <https://doi.org/10.1177/103841620801700204>
- McKay, J., & Marshall, P. (2001). The dual imperatives of action research. *Information Technology & People*, 14(1), 46-59.
- Mikalef, P., Pappas, I. O., Krogstie, J., & Pavlou, P. A. (2020). Big data and business analytics: A research agenda for realizing business value. *Information & management*, 57(1), 103237. <https://doi.org/10.1016/j.im.2019.103237>
- Miranda, S., Berente, N., Seidel, S., Safadi, H., & Burton-Jones, A. (2022). Computationally Intensive Theory Construction: A Primer for Authors and Reviewers. *MIS quarterly*, 46(2), III.
- Mitchell, M. (2023). Abstraction and analogy in AI. *Annals of the New York Academy of Sciences*, 1524(1), 17-21. <https://doi.org/10.1111/nyas.14995>
- Morgan, D. L. (2014). Pragmatism as a Paradigm for Social Research. *Qualitative inquiry*, 20(8), 1045-1053. <https://doi.org/10.1177/1077800413513733>
- Myers, M. D. (2009). *Qualitative research in business & management*. Sage Publications Ltd.
- Nalchigar, S., & Yu, E. (2020). Designing Business Analytics Solutions: A Model-Driven Approach. *Business & information systems engineering*, 62(1), 61-75. <https://doi.org/10.1007/s12599-018-0555-z>
- Namvar, M., Intezari, A., & Im, G. (2021). Sensegiving in organizations via the use of business analytics. *Information technology & people (West Linn, Or.)*, 34(6), 1615-1638. <https://doi.org/10.1108/ITP-10-2020-0735>
- NewVantagePartners. (2023). *Data and Analytics Leadership Annual Executive Survey 2023 - Executive summary of findings*. https://www.newvantage.com/files/ugd/e5361a_247885043758499ba090f7a5f510cf7c.pdf
- Nie, Y., Talburt, J., Dagtas, S., & Feng, T. (2019). The influence of chief data officer presence on firm performance: does firm size matter? *Industrial management + data systems*, 119(3), 495-520. <https://doi.org/10.1108/IMDS-03-2018-0101>
- O'Driscoll, K., Sammon, D., & Nagle, T. (2023). How a Traditional Organisation Matured a Business Analytics Capability. *UK Academy for Information Systems Conference Proceedings 2023*. <https://aisel.aisnet.org/ukais2023/16>
- O'Neill, B. T. (2019). *Failure rates for analytics, AI, and big data projects = 85% – yikes!* Retrieved May 2021 from <https://designingforanalytics.com/resources/failure-rates-for-analytics-bi-iot-and-big-data-projects-85-yikes/>
- Olmos-Vega, F. M., Stalmeijer, R. E., Varpio, L., & Kahlke, R. (2022). A practical guide to reflexivity in qualitative research: AMEE Guide No. 149. *Medical teacher, ahead-of-print*(ahead-of-print), 1-11. <https://doi.org/10.1080/0142159X.2022.2057287>
- O'Driscoll, K., Sammon, D., & Nagle, T. (2024). Unpacking the 'Black Boxes' of Analytics: A Data Value Map Analysis.
- Palvia, P., Mao, E., Salam, A. F., & Soliman, K. S. (2003). Management Information Systems Research: What's There in a Methodology? *Communications of the Association for Information Systems*, 11, 16. <https://doi.org/10.17705/1CAIS.01116>
- Pan, S. L., Nishant, R., Tuunanen, T., & Nah, F. F.-H. (2023). Literature review in the generative AI era - how to make a compelling contribution. *The journal of strategic information systems*, 32(3), 101788. <https://doi.org/10.1016/j.jsis.2023.101788>
- Partners, N. V. (2023). Data and Analytics Leadership Annual Executive Survey 2023 - Executive summary of findings. In.
- Popović, A., Hackney, R., Coelho, P. S., & Jaklič, J. (2012). Towards business intelligence systems success: Effects of maturity and culture on analytical decision making. *Decision Support Systems*, 54(1), 729-739. <https://doi.org/10.1016/j.dss.2012.08.017>

- Ragab, M. A. F., & Arisha, A. (2017). Research Methodology in Business: A Starter's Guide. *Management and Organizational Studies*, Vol. 5, No. 1. <https://doi.org/doi.org/10.5430/mos.v5n1p1>
- Ransbotham, S., Kiron, D., & Prentice, P. K. (2015a). Minding the analytics gap. *MIT Sloan Management Review*, 56(3), 63.
- Ransbotham, S., Kiron, D., & Prentice, P. K. (2015b). The Talent Dividend. *MIT Sloan management review*, 56(4), 1.
- Ransbotham, S., Kiron, D., & Prentice, P. K. (2016). Beyond the Hype: The Hard Work Behind Analytics Success. *MIT Sloan management review*, 57(3).
- Redman, T. C. (2008). *Data Driven : profiting from your most important business asset*. Harvard Business Press.
- Redman, T. C. (2021). What's Holding Your Data Program Back? *MIT Sloan Management Review*, 63(1), 1-10.
- Redman, T. C. (2022). Your Data Initiatives Can't Just Be for Data Scientists. *Harvard Business Review*. Retrieved August 2022, from <https://hbr.org/2022/03/your-data-initiatives-cant-just-be-for-data-scientists#:~:text=Companies%20need%20to%20design%20projects%20around%20the%20employees%20who%20actually%20use%20them.&text=Regular%20people%2C%20those%20without%20%E2%80%9Cdata,to%20all%20data%2Drelated%20work.>
- Riemer, K., & Peter, S. (2024). Conceptualizing generative AI as style engines: Application archetypes and implications. *International journal of information management*, 79, 102824. <https://doi.org/10.1016/j.ijinfomgt.2024.102824>
- Rockart, J. F. (1979). Chief executives define their own data needs. 57(2), 81-93. <https://go.exlibris.link/58XBq4kv>
- Rosemann, M., & Vessey, I. (2008). Toward improving the relevance of information systems research to practice: The role of applicability checks. *MIS quarterly*, 32(1), 1-22. <https://doi.org/10.2307/25148826>
- Sammon, D., & Adam, F. (2008). Justifying an ERP investment: critical success factors for transformation investments. *ICIS 2008 Proceedings*, 60.
- Sammon, D., McCarthy, S., Thummadi, B. V., Wibisono, A., & Fitzgerald, B. (2024a). Exploring the Potential of Large Language Models (LLMs) for Grounded Theorizing: A Human-in-the-Loop Configuration. Proceedings of the International Conference on Information Systems (ICIS 2024), Bangkok, Thailand.
- Sammon, D., McCarthy, S., Thummadi, B. V., Wibisono, A., & Fitzgerald, B. (2024b). Exploring the Potential of Large Language Models (LLMs) for Grounded Theorizing: A Human-in-the-Loop Configuration. Proceedings of the International Conference on Information Systems (ICIS 2024), Bangkok, Thailand.
- Sammon, D., & Nagle, T. (2013). Fast and Flexible: Exploring Agile Data Analytics. *Cutter Benchmark Review*, 13(2).
- Sammon, D., & Nagle, T. (2017, 2017). The Data Value Map: A framework for developing shared understanding on data initiatives.
- Saunders, M., Lewis, P., Thornhill, A., & Bristow, A. (2019). "Research Methods for Business Students" Chapter 4: Understanding research philosophy and approaches to theory development. In (pp. 128-171).
- Seddon, P. B., Constantinidis, D., Tamm, T., & Dod, H. (2017). How does business analytics contribute to business value? *Information systems journal (Oxford, England)*, 27(3), 237-269. <https://doi.org/10.1111/isj.12101>
- Shah, M. H., Braganza, A., & Morabito, V. (2007). A survey of critical success factors in e-Banking: an organisational perspective. *European journal of information systems*, 16(4), 511-524. <https://doi.org/10.1057/palgrave.ejis.3000693>

- Sharma, R., Mithas, S., & Kankanhalli, A. (2014). Transforming decision-making processes: a research agenda for understanding the impact of business analytics on organisations. In: Taylor & Francis.
- Smith, T., Stiller, B., Guszczka, J., & Davenport, T. (2019). Analytics and AI-driven enterprises thrive in the Age of With. *Deloitte Insights*.
- Someh, I., Shanks, G., & Davern, M. (2019). Reconceptualizing synergy to explain the value of business analytics systems. *Journal of information technology*, 34(4), 371-391. <https://doi.org/10.1177/0268396218816210>
- Stol, K.-J., Ralph, P., & Fitzgerald, B. (2016, 2016). Grounded theory in software engineering research: a critical review and guidelines. *Proceedings of the 38th International Conference on Software Engineering (ICSE '16)*, Austin, Texas, USA.
- Strauss, A. L., & Corbin, J. M. (1990). *Basics of qualitative research: grounded theory procedures and techniques*. Sage.
- Struthers, J. (2014). Analytic autoethnography: one story of the method. In J. Huisman & M. Tight (Eds.), *International Perspectives on Higher Education Research* (Vol. 10, pp. 183-202). Emerald Group Publishing Limited. [https://doi.org/10.1108/S1479-3628\(2014\)0000010015](https://doi.org/10.1108/S1479-3628(2014)0000010015)
- Stubbs, E. (2013). *Delivering business analytics: practical guidelines for best practice*. Wiley. <https://doi.org/10.1002/9781119203674>
- Suddaby, R. (2006). From the Editors: What Grounded Theory is Not. *Academy of Management journal*, 49(4), 633-642. <https://doi.org/10.5465/AMJ.2006.22083020>
- Sull, D. N. (2007). Closing the Gap Between Strategy and Execution. *MIT Sloan management review*, 48(4), 30.
- Susman, G. I., & Evered, R. D. (1978). An Assessment of the Scientific Merits of Action Research [Article]. *Administrative Science Quarterly*, 23(4), 582-603.
- Tabesh, P., Mousavidin, E., & Hasani, S. (2019). Implementing big data strategies: A managerial perspective. *Business Horizons*, 62(3), 347-358. <https://doi.org/https://doi.org/10.1016/j.bushor.2019.02.001>
- Taherdoost, H. (2022). What are Different Research Approaches? Comprehensive Review of Qualitative, Quantitative, and Mixed Method Research, Their Applications, Types, and Limitations. *Journal of Management Science & Engineering Research*, 5(1), 53-63.
- Thummadi, B. V., McCarthy, S., Sammon, D., & Wibisono, A. (2024). Reflections on a 'Human-in-the-Loop' Topic Modelling (HLTM) Approach to Systematic Literature Reviews. *Proceedings of the 32nd European Conference on Information Systems (ECIS 2024)*, Paphos, Cyprus.
- Ulrich, D., & Smallwood, N. (2004). Capitalizing on capabilities. 82(6), 119-138. <https://go.exlibris.link/tvCN86CQ>
- Vidgen, R., Shaw, S., & Grant, D. B. (2017). Management challenges in creating value from business analytics. *European journal of operational research*, 261(2), 626-639. <https://doi.org/10.1016/j.ejor.2017.02.023>
- Vryan, K. D. (2006). Expanding Analytic Autoethnography and Enhancing Its Potential. *Journal of contemporary ethnography*, 35(4), 405-409. <https://doi.org/10.1177/0891241606286977>
- Wagner, G., Lukyanenko, R., & Paré, G. (2022). Artificial intelligence and the conduct of literature reviews. *Journal of information technology*, 37(2), 209-226. <https://doi.org/10.1177/02683962211048201>
- Wall, S. (2006). An Autoethnography on Learning About Autoethnography. *International journal of qualitative methods*, 5(2), 146-160. <https://doi.org/10.1177/160940690600500205>
- Wiesche, M., Jurisch, M. C., Yetton, P. W., Krcmar, H., City of, M., Deaken, U., & Technische Universität, M. (2017). Grounded Theory Methodology in Information Systems Research. *MIS quarterly*, 41(3), 685-A689. <https://doi.org/10.25300/MISQ/2017/41.3.02>

- Wiita, N., & Leonard, O. (2017). How the most successful teams bridge the strategy execution gap. *Harvard Business Review*, 23.
- Xu, F., Zhan, H., Huang, W., Luo, X. R., & Xu, D. (2016). The value of chief data officer presence on firm performance. PACIS 2016 Proceedings. 213,
- Yanow, D., & Tsoukas, H. (2009). What is Reflection-In-Action? A Phenomenological Account. *Journal of management studies*, 46(8), 1339-1364. <https://doi.org/10.1111/j.1467-6486.2009.00859.x>
- Yin, R. K. (2018). *Case study research and applications: design and methods* (Sixth ed.). SAGE Publications, Inc.
- Yukl, G., Gordon, A., & Taber, T. (2002). A Hierarchical Taxonomy of Leadership Behavior: Integrating a Half Century of Behavior Research. *Journal of leadership & organizational studies*, 9(1), 15-32. <https://doi.org/10.1177/107179190200900102>
- Zamani, E. D., Griva, A., Spanaki, K., O'Raghallaigh, P., & Sammon, D. (2021). Making sense of business analytics in project selection and prioritisation: insights from the start-up trenches. *Information technology & people (West Linn, Or.)*. <https://doi.org/10.1108/ITP-09-2020-0633>

Chapter 7 Appendix

Appendix A: Paper 4 (Bridging the Analytics Strategy-Execution Gap: An Analytics Leader's Story): The 12 stories

This appendix provides the raw stories generated by the analytics leader and analysed as part of the HITL approach. Some sections of these stories are redacted (■■■■) due to (i) the sensitive nature of the text, (ii) the commercial sensitivity of the details of the analytics solution, or (iii) the commercial sensitivity of the brand details.

Story One “Raising the Heineken Profile”

Around 2015, the D&A team in HEINEKEN Ireland was beginning to grow and recruitment to the new roles was by the traditional method of using recruitment agencies. The calibre of candidates was ok but was by no means up to what I would have expected. Of significant concern was that the preferred candidates, upon being offered the position with HEINEKEN often rejected the offer in favour of other roles in organisations such as Paddy Power Betfair or the United Nations. In each case, the candidates ultimately took up positions with lower pay, but they rejected HEINEKEN as they felt that their D&A careers would develop more in these other more data-driven organisations. I took the view that while HEINEKEN might have been well regarded in many areas such as Sales, Marketing and Supply Chain and therefore had no problem attracting top talent in those functions, when it came to D&A, HEINEKEN did not feature as an employer of choice. If HEINEKEN was to have any chance of attracting the required talent to enable it to realise its Business Analytics ambitions, then it needed to raise its profile amongst the D&A community.

I decided it was best to fish where the fish were and target the two local third-level institutions to attract graduates and the analytics professional body to increase exposure amongst the practitioner community. Fortunately, at the time, I had just completed a course at University College Cork and was in the middle of one at Munster Technological University (The two relevant third-level institutions), so I had established contacts that facilitated arranging guest lectures with relevant classes. Each year I made

a point of attending the universities to deliver guest lectures showcasing how HEINEKEN was applying analytics and outlining the development opportunities available.

I had also been actively building up my own network of peers in similar roles in the area and attending meetups, industry gatherings and conferences. In this way, I came across the fledging Analytics Institute of Ireland. I joined as an individual initially to check it out and attended Inspire events hosted by other organisations (mostly in Dublin). In 2018, I decided to join the Analytics Institute as an organisation for two main reasons. Firstly, to provide access to the inspire events and analytics conferences for my team members as I was trying to foster a culture of looking externally amongst them, and secondly to help raise the profile of HEINEKEN amongst the community by attending events and hosting events of our own. We entered the analytics awards in 2019 and were happy to be shortlisted in two categories (analytics team of the year and analytics practitioners of the year) and I was happy with the resultant exposure and also the opportunity to use the awards ceremony as a team building opportunity.

When the Munster Chapter of the Analytics Institute was established in 2019, we took a stand at the launch event and also hosted the first Inspire event in Munster (see Picture 3 on page 81). Our Inspire event was held in our offices in the Ladyswell Brewery and attracted over 50 senior and experienced D&A professionals from all over Ireland. I gave a presentation outlining how the D&A team in HEINEKEN Ireland had developed and the positive impact it was having on the business and outlined our strategy, which was centred on an early version of the BAR. The reaction was very positive, and it clearly had an impact as I received a number of approaches in the subsequent weeks and months from experienced D&A professionals enquiring if there were any opportunities to join the HEINEKEN D&A team.



Lorcan Malone • 1st

Chief Executive at The Analytics Institute
5yr • Edited •

Thanks to everyone who attended our Inspire event in Heineken this morning. What a great venue! A big thanks to **Kieran O'Driscoll** and the analytics team in Heineken for being outstanding hosts.

Kierans presentation was superb.

Also thanks to Brian Sullivan in Ildiro for his insightful presentation.

See you all in November 27th at our National Analytics Summit

The concentrated efforts I was making in the third-level institutions also proved fruitful. For example, in 2017, HEINEKEN Ireland launched an internship programme, and I decided to open an intern position in the D&A team. In 2017, the number and calibre of applicants were very disappointing, and we struggled to fill the role. However, by 2019, after engaging in the profile-raising activity, we had over eighty applicants and the calibre was very impressive. In fact, the intern from that year is still working with HEINEKEN Ireland and performing very well.

[REDACTED]

When I moved to the AME Region, I observed a similar phenomenon. It was proving very difficult to attract talent, particularly in the predominately Muslim countries where only a subset of the population is interested in working for an alcoholic beverage company and in the more developed secular countries such as South Africa, where tech and finance companies dominate the data and analytics space.

I decided to seek out opportunities to raise the profile of HEINEKEN by speaking at conferences and encouraging my team members to do likewise, both for their own development and also to raise the profile of the organisation. For example, in May 2023, I presented at DataCon, the biggest data and analytics conference on the continent, with over three hundred attendees. I spoke about our strategy to become data driven and presented the BAR along with sharing a positive and realistic story of what it is like to work in the data space at HEINEKEN. I also brought ten team members, and through their questions, engagement with panel discussions, and presence at the event, I saw that they made a positive impact. The feedback was very good, and for the remainder of the conference, I had a queue of delegates looking to talk to me at each break.

Subsequently, other team members also spoke at other conferences, and by the end of 2023, we had collectively told HEINEKEN stories at seven data and analytics events. To illustrate the impact, in April 2023, we advertised for the role of AME Regional Data Management Lead, but the recruitment was unsuccessful as we did not attract enough suitable candidates. In October, we re-ran the same recruitment process and received almost 400 applications, and the calibre was very high. Likewise, recruitment campaigns for roles in the Analytics Hub, such as Data Scientists and Data Engineers, now attract hundreds of applicants, which was not the case a year earlier.



Picture 7: Presenting the BAR and sharing the HEINEKEN BA story to the MSc Information Systems for Business performance class at UCC, 2023

Story Two “Show me the Money”

In HEINEKEN Ireland, by 2017, demand for analytics solutions from the business was significantly increasing as the business benefits of data-driven decision-making were constantly being demonstrated. However, senior leadership was still not convinced, so no additional resources were available to the now significantly overstretched D&A team. Use cases were prioritised on the basis of value and alignment with the strategic priorities of the business, but due to the capacity constraints of the team, approximately 60% of business requests were refused due to a lack of team resources. I was very uncomfortable with the high level of saying no to the business. After years of building engagement with business leaders and demonstrating the value to them, it was now incredibly frustrating to refuse them when they came looking for analytics to help them make data-driven decisions. I was worried that the enthusiasm we had built up would be lost. As additional funding for the D&A team was not available, I needed to find another solution.

I decided to offer analytics as a service. When a business leader came with a request that the D&A team was not able to deliver, instead of saying no, I offered them the option of paying for the analytics solution. For example, Trade Marketing had a data collection app for which they were paying a third party. They wanted enhanced reporting that combined internal data with the data from the app. I agreed to take over the app from the third party (as the D&A team had PowerApps capability) and provided Trade Marketing with a holistic solution including a new app and enhanced reporting and analysis, all for a fee which was less than what they paid the external agency for just the app. The eBusiness team looked for a suite of reports and dashboards for their eCommerce solution, and Customer Service requested a new operational dashboard, and so on. In each case, the D&A team estimated the amount of resources required for each request, and we had a rate card (different rates for the different resources) to provide a cost estimate. When presented with the cost, the business owners then decided if they wished to pay for the analytics solution or not. In many cases, they proceeded as the solutions were valuable and provided a clear return on investment, but in some cases, they didn't as they determined that the benefit would not be worth the cost. I used the charges from the

analytics as a service work to increase the size of my team by bringing in contractors on a flexible basis as needed.

In many instances, the work was done by the regular team members, with the contractors backfilling them or doing work that would otherwise have fallen to the regular team. The flexibility of this model also meant that we could increase the size of the team when required and bring in the right type of resource, such as a data engineer or BI developer, as required. The model worked well, although HR did query a number of times what was going on when they noticed the extra team members in the office, so I did need to carefully navigate the narrative to HR, who were keen to ensure that the FTE numbers in the D&A team did not increase beyond plan.

Story Three “Getting AME Back on Track”

In 2022, AME was the region which delivered the greatest value from analytics. As a result, the region had a challenging target of value from analytics in 2023. The determination of the target was not very scientific and was based on high-level assumptions without a detailed bottom-up analysis. This was because the Regional Analytics Hub was still quite immature, and we didn’t yet have a fully developed process for use case selection and roadmap governance. For the first two quarters, the Analytics Hub remained optimistic about hitting the target and provided high-level predictions that we were on track.



However, at the end of Q2, the value actually delivered was quite small in relation to the target, but the Analytics Hub was still optimistic. The high-level estimates seemed credible, but a detailed analysis revealed that the predictions were based more on optimism and unrealistic expectations than on sound predictions. I realised that while everyone in the Hub had been very busy for the first half of the year, they were not on top of the value target (and neither was I), and we had been drifting on a sea of optimism for

the year to date. I instructed the team to prepare a dashboard to track the use case roadmap on a monthly basis, track the value delivered, and provide the latest estimate for the full year.

To my surprise, the team of BI developers and Analytics Product Managers, who were routinely developing excellent reports and dashboards struggled to produce a dashboard to track their own business. After a number of disappointing attempts, I needed to give direction and show them exactly what needed to be tracked, how each measure was to be defined and how the dashboard was to be laid out. As a former sales manager, I had assumed that it was obvious how a KPI such as value delivery should be tracked and measured, but as it turned out, for a team of technical data people it was not so obvious. Once the dashboard was delivered, I set up a monthly review with the global directors (our main stakeholders) and a weekly team review to manage the delivery against the target. With an intense focus on delivery, we managed to achieve the target by year-end, but it was difficult, and we didn't get to the point of exceeding the target until the middle of December. However, AME not only exceeded its value target in 2023, but for the second year in a row, the smallest region delivered the greatest value from Analytics.

Story Four “Trade Census F**K Up”

The Trade Census is a survey of the entire 'On Trade' market in Ireland, which is conducted every two years. It is the only source of competitor performance data at the 'outlet' (pub) level and involves sales reps interviewing pub owners and capturing a full picture of the market, including sales volume and distribution points for every product in every pub. It also captures data such as number and type of venues (nightclub, lounge, restaurant, etc) in each outlet, does it have a beer garden, offer live music, etc. It is a very important source of market information and is relied upon by the marketing and sales teams in the intervening two years.

In 2017 and 2019, I introduced radical transformations to the Trade Census (TC) leveraging new technology such as mobile apps, AI-generated insights, re-engineered processes, etc., but in 2015, the traditional process still applied. The way the trade

census was conducted up to 2015 was: Marketing devised the extensive questionnaire, IT built the survey in the CRM, Sales Reps had a month to visit all their customer to complete the questionnaire in the CRM after which IT made all the survey responses available to the D&A team in a SQL database. The work then began for my team to clean all the data, make the data available to be queried on the management information system and prepare the trade census for the trade census presentation.

The trade census presentation was a full-day event where the results of the trade census were presented by the D&A team to the commercial teams in the form of a 100-slide PowerPoint presentation followed by some breakout sessions where the commercial teams discussed the insights to be obtained. In 2015, the presentation was to be led by a new Commercial Analyst. While the analyst was in the business for 5 months, they always appeared confident, was well respected and liked by senior management, and seemed to get on with the team of colleagues; I [REDACTED]

[REDACTED]

[REDACTED]

As usual, the entire D&A team was focused on the Trade Census analysis in the two weeks leading up to the TC Presentation. With well over a million data points and the limited technology capabilities at the time, this involved working late and over the weekends to get the work done on time. The team was committed to completing this due to the importance of the TC in the OpCo and the high visibility it brought to the D&A team. In the days prior to the presentation, the team was obviously under even more stress than normal and not everybody was getting on. The new commercial analyst was complaining to me that others were not pulling their weight and not putting in the long hours that they and some others were. I had to carefully manage the relationships within the team, prioritise the tasks to be completed and help out with some technical tasks, but the presentation was completed on time.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

I come from a commercial background and have a very good understanding of the market from a commercial perspective – the data is not just numbers to me; I understand what the data represents. In 2011, when the D&A team was two people, I conducted 100% of the TC analysis myself, but in 2013 as the team started to grow, I was still hands-on involved. To me something didn't seem right; in particular, I was suspicious of the market share gains and distribution gains for one particular brand in one part of the country. It was plausible but I didn't fully buy it. The following day, back in the office, I decided to follow my suspicions and review the work of the team. I started with the presentation deck and worked back to the files used to prepare the charts and do the analysis. Everything stacked up until, after two full days of forensic investigation, I found it. At an early stage of the process of bringing the data from the SQL database into an Excel format for analysis, the data administrator made a mistake in a pivot table.

While it was a simple error, the consequences flowed all the way through and ultimately the entire analysis and everything that was presented was wrong. The data administrator was a long-serving member of the team, and it was out of character for her to make such a mistake. There were numerous opportunities for the commercial analyst to pick up on the error when they were subsequently analysing the data, but [REDACTED] the error went unnoticed. The days that followed were what I consider to be the lowest point for the HEINEKEN Ireland D&A team and called for multi-faceted leadership. As the leader of the team, I needed to take responsibility for what had happened.

I immediately spoke to the Sales Manager and the Marketing Manager, apologising, explaining that there had been an error, and all results of the Trade Census needed to be disregarded, and committing to revert to them within a couple of days with a proposal for a way forward. The team, in particular the data administrator, were distraught and upset, conscious of the reputational damage. The Commercial Analyst became more voracious in their criticism of the BI Developer, blaming the developer for the entire affair when he

hadn't made any error. [REDACTED]

[REDACTED] So, as a leader, I was facing a situation of a significant body of work not only not completed, but an incorrect version was released, the reputation of the team was in tatters, team members were distraught, and the team divided and descending into dysfunction. To provide cover to the team members and provide them with space, I took responsibility for the debacle and handled all the stakeholder engagements. I also led the development of a realistic plan with the team to correct the error, redo the analysis and relaunch a corrected Trade Census. Instead of continuing in a state of panic, this provided them with a way forward and clear actions to rectify the situation. I also needed to provide them with some emotional support and reassurance. Separately, while the commercial analyst had not made the original error, their underperformance was addressed [REDACTED]

In the end, the consequences of the Trade Census F**k Up were not too severe. The commercial teams appreciated the honesty of owning up to the error, which I think only enhanced the integrity of the team as we made no attempt to cover it up. A new commercial analyst joined the team, and the team dynamic improved and based on continuing successful outputs, the pride of the team members was restored. By the end of 2015, the analytics team was to be spun out of the support function as a function in its own right, and I, as leader of the team, was promoted to the Commercial Leadership Team.

Story Five “Data Tribe”

As a D&A Leader, my goal is not to deploy the latest data technology stack, create an impressive dashboard, or develop a cutting-edge AI solution. My goal is to lead an organisational transformation and to impact positively and meaningfully on organisational business performance. Achieving such a goal is therefore not just about technical competence, investment in technology or data solutions but is about the organisation, and therefore, D&A is a team sport with players from across the organisation. As time passes, I have noticed that the team players from across the organisation are more and more willing to take their place on the data-driven

organisational team. However, the willingness to become data-driven does not mean knowing or being competent in the steps to do so or how to play their role. Training has a role to play, but it is not enough. People from the various functions need to experience what it is to be data-driven, and the best way to learn is ‘learning by doing’.

In the Ireland OpCo I set up the concept of data champions. These champions were volunteers from each of the sales teams who were interested in working closely with the D&A team to develop solutions and as the SMEs then supported their colleagues in utilising those solutions in the field. The concept worked well and helped to spread by osmosis BA knowledge and the analytical mindset across the organisation. In the Egypt OpCo, we recently appointed an excellent external candidate to the role of OpCo D&A Manager. In just a few months, he transformed the BI reporting stack and has moved data-driven decision-making to a new level by providing business insights from taking business questions and providing insightful and actionable analysis. He has been working very hard to achieve this and has received excellent feedback from the senior leadership team in the OpCo. However, I challenged him on the sustainability of his approach as all the work is being done by himself and one other analyst on his small team. If we scaled data-driven decision-making further, it would require a big increase in the size of the D&A team, which is not practical. Instead of providing the business decision-makers with ‘fish’ we need to teach them ‘how to fish’.



To this end in Egypt, I have supported the local D&A Manager to set up an initiative called Data Tribe. The Data Tribe is made up of sponsors and champions from each business function. The functional leaders such as Sales Director, HR Director, Finance Director, etc have agreed to be the sponsors. This ensures the senior leadership backing for the data Tribe. Champions have been identified and volunteered from each of the respective functions. The idea is that the sponsors and champions receive specific training on D&A to equip them with the knowledge to play their role in the Data Team Sport. Instead of the

central D&A team driving all data-driven decision-making, the Data Tribe is to drive the transformation and, in conjunction with the D&A team, develop analytics solutions, address data challenges, and build an analytical mindset in their own functions. The Data Tribe initiative, which is still in the early stages is what I consider a pilot, and once the formula is refined sufficiently and if it works, I intend to deploy it to the other OpCos in the AME region.

Story Six “What’s New?”

I get bored easily. If we keep doing the same things in the same way, then I get frustrated. This is not always good, and I have received feedback in the past from business stakeholders that I sometimes move so fast to the next new thing that others struggle to keep up and get left behind. I’m also prone to breaking a process that is working perfectly well just to see what would happen and explore if it could be done in an even better way. On the other hand, it does mean that I and the organisation make breakthroughs that lead to significant improvements, sometimes through deploying new technology, sometimes through new processes or sometimes just learning and building knowledge.

Exploring new things and experimenting can be time-consuming and faced with the pressure of delivering against day-to-day demands, experimentation can often be deprioritised by under-pressure D&A teams. That is one of the reasons why I brought interns into the Ireland OpCo D&A team. In addition to connecting with third-level institutes, sourcing new talent, and bringing new ideas to the team, the intern programme was also intended to provide a resource for exploring new things. I gave each of the interns a specific business challenge to explore, which I thought had some potential, such as using NLP to analyse conversations between the call centre and customers or using computer vision to identify brands and tap types on bar counters from photographs sales reps were taking in trade. Some of these proved fruitful and went on to form the basis of analytics solutions while others were less so, but we had the benefit of learning and failing fast without investing much.

Following on in a similar way, I introduced ACE (AME Creative Experimentation) this year. ACE is an initiative where people in the OpCo and Hub teams can apply to work on experimentation, and they are provided the time out of their day jobs to do so. The criteria for ACE is that there must be some potential application across the HEINEKEN value chain, the experimentation must be innovative (lots of Gen AI interest this year), and the experiment is also time-bound as the idea is to create a safe environment to fail fast. There is no requirement or expectation that the experiment will be successful. The only expectation is that we learn something, either as a basis for further research or learn why something doesn't work to help inform future initiatives. I think the benefit of formalising an initiative such as ACE, is that without a formal purpose and leadership sponsorship, the team members get frustrated as they are unable to find the time away from the day job to do something new and miss out on the satisfaction from making a new discovery.

Story Seven “Sowing the Seeds of Glory”

In 2020, HEINEKEN Ireland won the Implementation of AI Award at the national Analytics & AI Awards by the Analytics Institute of Ireland. I was very proud on behalf of the team to have won the award especially as following review by the judging panel, the final award was voted on by industry peers. It is interesting to think that the success of the award can be traced back to my efforts to evangelise data-driven decision-making across the organisation. The award was received for an AI solution which was deployed during COVID-19 to determine which pubs had full and empty kegs to be uplifted in preparation for the re-opening of the trade.



The model was an updated version of a keg census model, which I had coded a year earlier to predict where empty kegs were located. The keg census model was developed in response to a request from my supply chain colleagues to explore if an AI solution could be used to replace the previous keg census process. (The AI models did successfully improve the accuracy and reduce the time, and the cost compared to the

old manual process). While not within my remit at the time, I had given a presentation to the Supply Chain Leadership Team of the Ireland OpCo to showcase the benefits of D&A and how it could deliver value to the organisation. My presentation prompted a request from the distribution manager, who had been grappling with his keg census problem, which led to the development of the keg census AI solution. If I had not been actively evangelising D&A through Lunch&Learns, OpCo Newsletters, sharing Videos, presentations to other teams, then the Keg Census project would not have happened, and we ultimately would not have developed the Award-winning project.

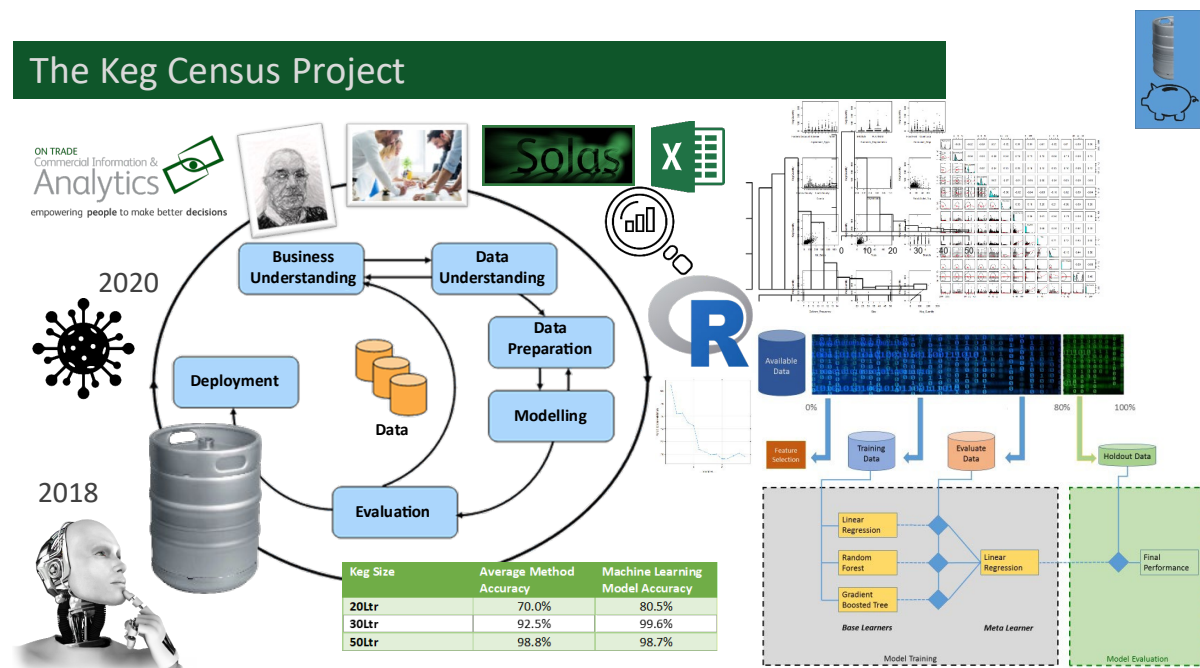


Figure 34: Overview of HEINEKEN Ireland Keg Census Project

Story Eight “It’s Not Me, It’s You!”

When I look back at my biggest successes and jobs well done, the ones that constantly come to the fore and the ones I am most proud of are those that I was not involved in. An example is the Trade Census in Ireland in 2019. The launch event, the presentation, the insights generated, and the self-serve analysis tools delivered were game-changers in the Ireland OpCo, not only in terms of the immediate commercial actions taken but also in the advancement in fostering a data-driven mindset across the organisation. The best part is that I was not involved in generating the insights or the presentation. I just had a

five-minute slot at the opening and the team delivered the rest of the day. As the leader of the team, I took great pride in their success and to see my role as leader to develop the team members so that they can achieve such success without my input.

For example, one of the stars of the Trade Census was team member 'AB'. He had built the Trade Census app, the self-serve analysis tool and had also presented on the day examples of insights that could be generated using the new tool. AB had joined the OpCo D&A team two years earlier. His past experience was as a reporting developer, and in his previous role, he worked as an individual contributor, in a remote location and on his own. He received requirements for the reports and built solutions to those requirements without much interaction with end users. He did also not work as part of a team. When he joined, he initially struggled to fit in with the agile way of working in the D&A team. Instead of getting clear requirements, he was now expected to interact with business users, develop an understanding of their business needs, help them design the solutions, and then iteratively develop the solutions in collaboration with the other team members.

I recognised the friction which his needs were causing in the team, but I also recognised his potential, so I took a multi-faceted approach to developing his capability to reach his potential. Examples included asking the other team members to be patient with him and to support him, setting up weekly 1:1 coaching sessions where I provided him with feedback and guidance on how to handle situations and also giving him responsibility for two projects which involved working closely with business areas. I specifically selected these two projects because I knew the two business owners who were very experienced would be able to provide good mentorship to AB. I had a good relationship with them both and I aligned with them in advance on how their respective projects could be good opportunities for AB's development and asked them to take on an informal mentorship role with AB. The results were excellent as AB delivered excellent solutions (which I knew he would, based on his strong technical skills), and through working with my hand-picked informal mentors, he quickly developed business knowledge and commercial acumen and significantly improved his soft people skills.

Within two years, the new hire who had struggled to fit in was achieving the top performance management grades and was recognised by the senior Management Team members of the OpCo as a valuable and top performer. He also recognised how much he had developed in such a short time and when offered another opportunity, he chose to stay in the D&A team in order to continue his personal development. While this is just an example of one individual, I consider the development of my team members as the most impactful and the most effective things for me as a leader to focus on.

Story Nine “The Consumer (Data) is Not Always Right”

The AME D&A strategy is about delivering higher impact by focusing on activities that deliver actionable business value. Every time the teams need to deliver analytics which are valuable (a return on investment that is worth the effort and solving business problems aligned to business strategy), actionable (end users need to be able to take an action that they otherwise wouldn’t do) and feasible (availability of a solid data foundation). The benefit of a clear strategy is it provides guidance to team members on what they should do, especially at a time when there are conflicting demands on their time.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

While it was a difficult decision to stop the deployment of an important data solution, I noticed amongst the D&A team an appreciation for the clear direction, the action of sticking to the strategy (thereby reinforcing the strategy), and avoiding the confusion and frustration which can happen by flip flopping around and having confusing and contradictory messaging from leadership.

Story Ten “You have Reached Your Destination”

In addition to achieving hard KPIs such as value from Analytics Use cases or improvements in Data Quality, I believe there are many other soft indications that an organisation is successfully transforming to be a data-driven organisation. For example, in HEINEKEN Ireland, one of my BI Developers was awarded employee of the year in 2016 (1 of only 2 years the scheme existed) as voted by the entire organisation for the impact being delivered. In 2020, the Ireland OpCo received external validation, winning an Analytics & AI Award for Implementation of AI as voted by industry peers, many of whom had visited HEINEKEN Ireland offices and seen first-hand how the BAR strategy was transforming the organisation.

Similar examples can be seen in HEINEKEN AME Region; for example, the AME D&A team has won a HEINEKEN Global D&T Award (competing against every D&T Team in HEINEKEN at the Global, Regional and OpCo level) for the last two years in a row. Furthermore, AME as the smallest region has delivered the highest value from analytics for two years in a row, the first to complete major data programmes such as Data Prime and is serving as the template for other regions to follow in terms of building a data capability.

However, to my mind, the greatest indications that the organisation was indeed becoming data-driven came from observing how people behave, and two instances from HEINEKEN Ireland come to mind – evidence of a culture of data decision-making and instances of other senior business leaders making data-driven decisions even when not in agreement with their gut feeling. The OpCo has a monthly commercial strategy implementation meeting attended by the commercial leadership team and amongst other topics, the brand teams come to pitch their proposed marketing and activation plans.



Figure 35: HEINEKEN Ireland Brand Portfolio

At one such meeting in 2019, a brand manager who had just returned from a year away on secondment presented his plans for rolling out additional distribution for BRAND A, along with a targeted list of accounts which he was asking the sales teams to action. He selected the targeted accounts by ranking the nationwide accounts which did not yet have a BRAND A tap installed on the basis of BRAND B sales volume. This was a reasonable approach as BRAND B and BRAND A were in the same product category, but it does not consider the differences in consumer profile and market positioning of the two brands or the characteristics of the individual accounts. Yet, it was the approach to identifying target accounts which had been used in the past. As a member of the Leadership Team, I was in attendance at the meeting, but without me saying a word, both

the national Sales Manager and the Marketing Manager almost immediately and simultaneously shot down the proposal from the Brand Manager. They were adamant that they would not be asking the sales teams to action such a distribution target list because it was not how such decisions were made anymore. The ‘way we do it is to use data and analytics to determine the best new outlets for new distribution of our brands’.

The brand manager was shocked. After giving a non-technical overview of how we use granular account-level data such as distribution and volume performance of other brands, competitor activity, location of the outlet, demographics, and so on, they then turned to me to explain to the brand manager ‘how we do it here now’ and advise him who he needed to contact the BA team to help him proceed. I gave him the name, and about an hour later, after the full meeting had finished, I called my team member to give her the context and let her know to expect a call from the brand manager. She informed me that he had already been in touch, and she was curious to know what had happened because the brand manager had received the message loud and clear that the way to make decisions in this organisation was now the data-driven way.

Story Eleven “Getting into the Trenches”

In 2015 the HEINEKEN Ireland D&A team was already experimenting with advanced analytics and were applying machine learning to business problems. While I had developed a good technical appreciation of BI, data analysis and modelling, it became apparent as advanced analytics techniques became more prevalent, that I needed a greater technical understanding and expertise in the area of advanced analytics. I believed that in order to effectively lead and guide the team, I needed to build my own knowledge of their technical world including an appreciation of the challenges they face and an understanding of the art of the possible.

There had been instances where I challenged the team to consider if an ML solution to a business problem was possible, and the data scientist replied that there was no opportunity. I was not satisfied relying on the qualified data scientists in HEINEKEN Ireland as I suspected that opportunities were being missed as they did not possess the

required overlap of business understanding and analytical thinking to identify opportunities. This is why I went back to college myself and obtained a HDipSc in Data Science. I never intended to work as a data scientist and the purpose was so that I could engage better with my team. As a leader, once I had the advanced analytics skills, I found I was able to challenge and inspire the data scientists with potential opportunities that they could not see on their own. Leading the small team in the OpCo, I was closer to the technical development of solutions, from dashboards to AI models and data infrastructure.

In the AME regional role, I spend less time hands on guiding the building of solutions as I rely on bigger teams of Data Engineers, Data Scientists and Developers but still utilise my own analytics technical skills on a daily basis in order to guide the team direction while also identifying opportunities and managing the expectations of the business.

Story Twelve “Hurry Up – This way to Success”

In general, I am never satisfied with the status quo and always curious to explore a better reality and keen to utilise the latest new technology, or method, which is why analytics is so appealing. However, while this visionary thinking has been recognised by colleagues in both the Ireland OpCo and AME Region, it has not always been smooth sailing. Feedback from business peers on the HEINEKEN Ireland Leadership Team has been that I am always chasing the next shiny new thing and move so fast that they and the rest of the organisation are often left behind.

In AME this has also come up with the AME Supply Chain Director recently saying, “You have just run a marathon, and you are telling us it is easy, but we are still learning how to walk”. This goes not just for the business teams but also my own team. After developing the first iteration of the BAR (Business Analytics Recipe), I noticed that my own team was slow to change their own approach and ways of working. I decided to hold an off-site, spending time away from the office to explore the team’s own purpose and how it was to develop. I started with an exercise questioning the purpose of the team. All the team members provided operational purposes for the team, such as building reports and

dashboards, administering the data systems, answer queries from business stakeholders. I realised that I needed to spend time and effort on change management to bring the team on the journey to understand, buy into and make the Data & Analytics strategy their own.

It was at that point that the Organisational Culture pillar, initially called mindset was added to the BAR. Through a series of off-sites, external visits to conferences etc., and reinforcing ways of working based on the BAR, the team mindset developed to embracing and bringing to life the BAR. The D&A team needed to be pointed in the direction of an ambitious vision and given the support and freedom to achieve it. A practical example of this was the development of a new Trade Census in Ireland in 2018. The Trade Census is a survey of the entire customer base completed by the Sales Reps. The previous version was based on excel integrated with the CRM system. We had an idea to replace it with a PowerApps solution, which would be mobile rather than laptop based and would allow much greater levels of automation and real-time analysis with instant insights provided to the Sales Reps. This was to be the first large-scale PowerApps solution to be developed by the Analytics Team, and there was not enough time to develop both the new and traditional solutions for the 2018 Trade Census. The analytics team were risk-averse, and each member wanted to use the tried and trusted solution. By taking responsibility as the leader and providing the team with a safe space to fail with the new solution, they went on to develop an excellent solution that advanced the data-driven capabilities of the organisation.

Appendix B: Paper 4 ChatGPT Prompts

This appendix provides the ChatGPT4 prompts used as part of the HITL approach.

1. Provide a list of the topics being discussed in this leader's story titled "INSERT STORY NAME". Provide the output in the following format: [topic name] and a brief 1 sentence description of the topic. "STORY BODY TEXT HERE".
2. Yukl (2002) identified three types of behaviours which may be relevant for understanding effective leadership, namely task behaviour, relations behaviour and change behaviour. Task Behaviours involve the following: "Plan short-term activities", "Clarify task objectives and role expectations", "Monitor operations and performance". Yukl (2002) identified three types of behaviours which may be relevant for understanding effective leadership, namely task behaviour, relations behaviour and change behaviour. Relations Behaviours involve the following: "Provide support and encouragement", "Provide recognition for achievements and contributions", "Develop member skill and confidence", "Consult with members when making decisions", "Empower members to take initiative in problem solving". Yukl (2002) identified three types of behaviours which may be relevant for understanding effective leadership, namely task behaviour, relations behaviour and change behaviour. Change Behaviours involve the following: "Monitor the external environment", "Propose an innovative strategy or new vision", "Encourage innovative thinking", "Take risks to promote necessary changes". Do you see any of these three types of behaviours in the "INSERT STORY NAME" leader's story?
3. Can you now map the topics you identified earlier in this conversation onto the three types of behaviours for understanding effective leadership (task behaviour, relations behaviour and change behaviour) identified by Yukl (2002).
4. Korherr et al. (2022) identified four archetypes ("Analytical Thinker", "Coach", "Guide" and "Strategist") prevalent amongst senior organisational leaders transforming organisations to become data-driven. They propose that all the identified archetypes are beneficial and necessary for transforming an organisation to become data-driven. The "Analytical Thinker" is rational, logical, possess good technological understanding of analytics and strives for the implementation of technically optimum analytics models to answer business

questions or issues. They are also keen to share their technical expertise and tend to be well connected, not only within the organisation but also to external analytics specialists (Korherr et al., 2022). The “Coach” archetype possesses strong soft skills such as problem-solving, conflict resolution, communication, patience, and situational awareness. While they contribute less to the design of analytics solutions, the competencies and characteristics which they bring to the data-driven transformation are crucial as they lead the diverse set of data and business specialists across the organisation to collaborate in a constructive way to achieve the common data-driven transformation goal (Korherr et al., 2022). The “Guide” has accumulated long term leadership experience and possesses extensive business expertise including deep knowledge of the market, customers, competitors, and business operations. They represent a large percentage of senior executives in organisations and based on their wealth of knowledge, experience and credibility are solid leaders who can effectively handle difficult situations which is essential especially during turbulent stages of a data-driven transformation (Korherr et al., 2022). With an open mind, the “Strategist” is characterized by strategic visionary thinking with a strong enthusiasm for technical innovations. They provide employees with the space for innovation and encourage their teams to break out of entrenched, rigid thought processes, which especially in well-established organisations, is essential to enable data-driven transformation (Korherr et al., 2022). Do you see evidence of these four archetypes in the “INSERT STORY NAME” leader's story? Position these archetypes chronologically (where possible) and highlight their importance.

5. Can you now map the topics you identified earlier in this conversation onto the four archetypes (“Analytical Thinker”, “Coach”, “Guide” and “Strategist”) that are prevalent amongst senior organisational leaders transforming organisations to become data-driven (identified by Korherr et al. (2022)).
6. Reflecting on your analysis of the “INSERT STORY NAME” leader's story can you now map the four archetypes to the leadership behaviours (provide evidence to support your mapping)?

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empowering **people** to make better **decisions**



Figure 36: From Empowering People to Make Better Decisions in Ireland, to achieving HIGHER impact, with FASTER analytics, through STRONGER collaboration and data foundations, across Africa & Middle East.

