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PRACTICE INSPIRED CRITICAL SUCCESS FACTORS FOR “DOING” DIGITAL TRANSFORMATION

Abstract

Purpose:

The pace of Digital Transformation (DT) is accelerating within organisations, and this has blossomed a commentary around what we refer to as “doing” DT. Despite this trend, it is hard to find a collection of Critical Success Factors (CSFs) for DT, from either the academic literature or trade press. For the purposes of this research, we define DT as the strategic use of emergent and emerging technologies to make an organisation more customer-focused, innovative, and efficient, through optimising processes, data, and people, disrupting business and operational models to deliver value to all stakeholders. Therefore, the objective of this theory-building research is to explore the CSFs for DT in a pre-digital organisation.

Design/Methodology/Approach:

For the purposes of this theory-building research we take inspiration from features of the Gioia Methodology. Therefore, we pose the following research question: What are the CSFs for DT that impact positively on the outcome of a DT initiative within a pre-digital organisation? To answer this question we code (following an inductive open, axial and selective coding approach) the stories of 16 key informants (DT leaders). We also survey a further 30 DT leaders to evaluate the importance of our findings (the degree to which each of our nine CSFs for DT are deemed “essential”).

Findings:

We present nine CSFs for DT in a pre-digital organisation as a conceptual model. We also evaluate these CSFs for DT, and this evaluation reveals that seven of our CSFs for DT are deemed essential. Furthermore, our evaluation also reveals three interesting patterns, one of which highlights the importance of three specific CSFs that impact on ‘Culture Change’ when “doing” DT in a pre-digital organisation.

Originality/Value:

This paper is unique in its approach and the CSFs presented can sharpen the DT focus of academia and practice. Our contribution advances the first comprehensive conceptualisation of the “essential” CSFs for DT in a pre-digital organisation, thereby strengthening the relevance for practitioners striving for the best possible DT initiative outcome.

Keywords: Digital Transformation, CSFs, Inductive Coding, Culture Change, Theory Building, Key Informants.

Paper Type: Research Paper

1 Introduction

Despite the growing interest in Digital Transformation (DT), Information Systems (IS) scholars and practitioners continue to “struggle to grasp what [DT] really is” (Wessel et al., 2021, p.102). The complexity of DT is evident in the recurring discussions and misconceptions in both the academic and trade press. For instance, articles in Sloan Management Review with titles like “Five Myths About Digital Transformation” and “The Nine Elements of Digital Transformation” underscore the confusion and challenges faced by organisations undertaking DT initiatives. In fact, a 2019 article published in Harvard Business Review, titled “Digital Transformation is Not About Technology”, considers why

some DT efforts succeed and others fail. Their revealing statistic illustrates that “70% of all DT initiatives do not reach their goals”, and of the \$1.3 trillion spent on DT in 2018, approximately “\$900 billion went to waste” (Tabrizi et al., 2019, p.1). Clearly, achieving a successful DT outcome remains a pressing and widespread concern for both business and IT leaders.

For the purposes of this research we conceptualise DT as occurring within the organisational context and that all organisations are striving to have the level of DT maturity synonymous with being “*Digital Masters*” (Westerman et al., 2011). Furthermore, we define DT as *the strategic use of emergent and emerging technologies to make an organisation more customer-focused, innovative, and efficient, through optimising processes, data, and people, disrupting business and operational models to deliver value to all stakeholders*. Overall, this definition effectively conveys the multifaceted and disruptive nature of DT, emphasising specific priorities, such as strategic intent, customer experience, cultural adaptation, technology adoption, process optimisation, and value creation. Therefore, DT is seen as something that invokes change or creates an evolution in an organisation (Dremel et al., 2017, Hansen and Sia, 2015, Fitzgerald et al., 2014). DT conveys an organisational message of acceptance of a need to find new ways to innovate using technologies. In fact, “*digital transformation is a company-wide phenomenon with broad organisational implications in which, most notably, the core business model of the firm is subject to change, by means of digital technology*” (Verhoef et al., 2021, p.892).

The motivation for exploring DT goes beyond just understanding its complexity; it addresses an urgent need for insights into what makes DT efforts succeed or fail. While research has grown in recent years, significant gaps persist in understanding the nuanced processes and success factors associated with DT. Scholars have called for further investigation into various aspects, including how to sustain DT efforts (Carroll, 2020), organizational readiness (Nguyen et al., 2021), the impact of appointing a Chief Digital Officer (Metzler et al., 2021), the role of middle management (Nadkarni and Prügl, 2021), the attributes of effective DT leadership (Pabst von Ohain, 2019), guidance on the digitalization process (Escobar et al., 2023), and prioritising practitioner activities throughout DT phases (Berghaus and Back, 2017). Yet, comprehensive studies linking these factors to actionable steps for DT leaders remain sparse.

Although DT is considered an emerging area, several studies have proposed different DT process models (Rueckel et al., 2020; Muehlburger et al., 2019). These studies have helped our understanding of the DT concept and in shaping its boundaries. However, more theoretical/empirical studies are needed to explore how organisations can undertake DT in a meaningful way (Mergel et al., 2019). Given that DT initiatives often require transforming organisational structures and business models to improve service to current customers and reach new markets (Haffke et al., 2017; El Sawy et al., 2016), understanding how to navigate this transformation becomes even more critical. Therefore, this research aims to address this gap by exploring the Critical Success Factors (CSFs) for DT. Specifically, we pose the following **Research Question:** *What are the Critical Success Factors (CSFs) for Digital Transformation (DT) that impact positively on the outcome of a DT initiative within a pre-digital organization?* To answer this, we adopt a theory-building research strategy to deepen our understanding of these CSFs within the context of pre-digital organizations.

The remainder of this paper is structured as follows. In the next section we present the theoretical underpinnings for our work, motivating our focus on CSFs. Thereafter, we focus on the two-stage research approach being followed. This is followed by a presentation of our observations gained through coding 16 key informant interviews (those operating as DT leaders in their respective organisations) and analysing the responses of 30 DT leaders to a short online survey (evaluating the importance of each CSF). We also position our grounded theorising work against a subset of ten ‘seminal and highly cited’ research papers (a snapshot of 60+ years of IT-enabled transformation literature), along with two more recent ‘CSFs for DT’ specific papers. Finally, the paper concludes with the implications for both theory and practice, while also providing some opportunities for further research.

2 Theoretical Underpinnings: Why the need for CSFs?

To date, reviews of the literature, focusing on DT, have been conducted (e.g. Senarathna and Wickramarachchi, 2024; McCarthy et al., 2021; Vial, 2019; Morakanyane et al., 2017; Gerster, 2017;

Piccinini et al., 2015; Henriette et al., 2015; Besson and Rowe, 2012)). This emerging scholarly attention positions DT as a *“leading technology-related phenomenon”* (Wessel et al., 2021, p.102). Therefore, extant research on DT presents a comprehensive and multidimensional understanding of a phenomenon which has become a strategic imperative for organizations across different sectors. Like all types of change programmes, DT can be understood as altering the *people, process, technology, and data* components of an organisation (Muehlburger et al., 2019, Matt et al., 2015). Several core themes emerge across these research studies, highlighting the intricacies, challenges, and success factors associated with DT.

For example, one prominent theme is **leadership** as a driving force in DT. Nisioi et al. (2023) emphasize that effective leadership is crucial in navigating the complexities of DT, and they offer insights into the necessary traits and behaviours for successful change. In fact, McCarthy et al. (2021) suggest that there is a relatively small number of empirical research outputs focusing on DT leadership, based on their analysis of 87 empirical studies (from 93 top ranked ‘information management’ journals and 8 major AIS conferences). Therefore, this theme underscores the human dimension of DT, where leadership not only facilitates technological adoption but also inspires organizational culture shifts. However, another recurring theme is the **barriers and challenges** faced in the DT process. For example, Gkrimpizi and Peristeras (2022) specifically investigate barriers faced, categorizing them into contextual, social, technical, and cultural obstacles. Similarly, Edelman et al. (2023) document barriers, including organizational culture and legal frameworks. These barriers are critical to understanding why some organizations struggle to achieve seamless digital integration, indicating that overcoming these obstacles requires a multifaceted approach, including cultural adaptation. Furthermore, Crusoe et al. (2023) highlight the gap in knowledge and preparedness (emphasising the ignorance of DT prerequisites) that must be addressed to enable effective transformation.

Studies, such as those by Senarathna and Wickramarachchi (2024), Chen et al. (2023) and Tamtam et al. (2023), focus on **frameworks and success factors**. Senarathna and Wickramarachchi (2024) synthesize factors like leadership, culture, technology, and customer focus, contributing a coherent framework for implementing DT strategies. Chen et al. (2023) examine the motivations and stages of DT in SMEs, providing insights that can serve as benchmarks for similar organizations. Furthermore, Tamtam et al. (2023) focus on the critical success factors (CSFs) necessary for agile DT, using AI as a key driver in the context of Industry 4.0. Their work illustrates the interplay between technology and organizational readiness, offering a structured approach to identifying and prioritizing CSFs. These studies reflect the growing recognition that successful DT requires both technological and organizational agility and underscore the importance of structured frameworks and strategic planning. In summary, these research studies collectively underscore that DT is a multifaceted journey influenced by leadership, organizational culture, and technological infrastructure. Furthermore, as DT continues to shape organizational landscapes, these themes represent the current conversations and areas of focus within the academic and practitioner discourse. However, despite this growing research focus, it is hard to find a well established set of CSFs for DT, particularly grounded in practice, in a pre-digital organisational context. Furthermore, where CSFs for DT have been identified recently (c.f. Al Maazmi et al., 2024; Zhong et al., 2024; Alojail et al., 2023) they are focused specifically on the public sector and do not examine the connections between the CSFs (which is the ambition of this work).

For the purposes of this research CSFs are defined 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 IS research and practice over the last three decades in order to make sense of problems by identifying the factors that could influence business activities and outcomes (Tamtam et al., 2023; Alhassan et al., 2019; Shah et al., 2007; Butler and Fitzgerald, 1999; Jensen 1986). 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 (Alhassan et al., 2019). In essence, their continuing popularity is linked to their most valued characteristic of simplicity, as a statement of focus and action for key stakeholders. 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 (c.f. Tamtam et al., 2023; Alhassan et al., 2019; Sammon and

Adam, 2008; Butler and Fitzgerald, 1999). One IS topic, synonymous with ITOT (IS/IT-enabled organisational transformation) (Wessel et al., 2021), is the *Transformation Investment* (Ross and Beath, 2002) in ERP (Enterprise Resource Planning) systems that defined much of the 1990's and 2000's for organisations globally. In particular, this ITOT body of literature provides significant coverage of the CSFs for ERP project/programme implementations. However, there appears to be a lack of CSF coverage for the current wave of organisational DT initiatives. Therefore, we argue that understanding the CSFs for DT could lead to a more successful DT outcome within an organisation, specifically when appreciating the associated actions of DT leaders, and given the large percentage of DT initiatives that do not reach their desired goals. In fact, research shows that “failure rates” for the introduction of IS initiatives still remain high (O'Neill, 2019; Cecez-Kecmanovic et al., 2014). 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).

We believe that our work shifts the frontier of knowledge on DT and presents a new way of conceptualising DT. We set about understanding the CSFs for DT in a pre-digital organisation in a unique way, using a grounded approach. We believe that our approach strengthens the *importance* (c.f. Rosemann and Vessey, 2008) of our research outputs for IS practitioners, where the practitioner voices and their lexicon are central to the theorising and the outputs produced. In the next section we present a detailed description of our research approach to building theory.

3 Research Approach

In answering our research question, we embrace a theory building research strategy to develop an understanding of the CSFs for DT in a pre-digital organisation from those “*practitioners currently in the DT trenches*” (i.e. a data-to-theory approach)” (reference withheld for review purposes). Therefore, in operationalising our approach, we design a two-stage research study. In stage one, we generate nine critical success factors (CSFs) for DT in a pre-digital organisation. These CSFs emerge through coding 16 key informant interviews, capturing the unique DT experiences of these DT leaders. In stage two, to further elevate the relevance of our work, we survey a further 30 DT leaders to evaluate the *importance* of each of the nine CSFs (using a high, medium, low rating scale). It is also worth mentioning that the 46 DT leaders involved in this study are/have been affiliated with organisations “*born in the pre-digital age*” and they are conscious that they are balancing “*tensions between the ‘old’ and the ‘new’*” when transforming (Oberlander et al., 2021 p1). Throughout our inductive approach, we have maintained an “*analytical discipline*” in order to produce “*credible interpretations of data*” and conclusions that are both “*plausible and defensible*” (Gioia et al., 2013 p.15). Our theorising efforts at concept development and our making sense of the organisational world, that practitioners live in, affords us with the opportunity to produce the nine CSFs for DT in a pre-digital organisation.

Inspired by features of the Gioia Methodology, which is positioned as a “*systematic inductive approach to concept development*” and assumes that “*the organisational world is socially constructed*” (Gioia et al., 2013 p.17), we aim to conceptualise the practitioner voice and not “*substitute practitioners’ understandings for theory*” (Markus & Rowe, 2021 p.273). Therefore, embracing “*concept development*”, where a concept captures “*qualities that describe or explain a phenomenon of theoretical interest*” (Gioia et al., 2013 p.16), we afford ourselves the opportunity to “*capture the meaning*” from those practitioners “*living the experience*” (leading a DT initiative) and “*theorise about that experience*” (Gioia et al., 2013 p.26). As a result, in data collection there is a need to “*give extraordinary voice to informants, who are treated as knowledgeable agents*”; while in data analysis there is a need to maintain “*the integrity of 1st order (informant-centric) terms*” during initial data coding, and further “*organise 1st-order codes into 2nd-order (theory-centric) themes*” (Gioia et al., 2013 p.26).

3.1 Stage One

In stage one, we select sixteen key informants for interview, based on their organisational perspective (Business or IT) and role (Strategic or Operational). Interviews took place over sixteen months (between November 2018 and February 2020) and ranged in duration from 35 to 75 minutes with an average

interview duration of 60 minutes (see Appendix A for the interview guide used in this research). These key informants (representing eleven organisations) are considered DT leaders within their respective organisations (e.g. CEO/CIO/CTO, Business Transformation Director/Manager, Lead Digital Business Analyst) and their voices reflect those of their industry peers. On average these key informants have 15+ years of industry experience in the area of business/IT transformation (within single and multiple DT initiatives in MNC/SME environments across a variety of sectors, e.g. Technology [6], Higher Education [4], Energy [2], Agriculture [2], and Healthcare [1]). This stratified selection of key informants affords us the opportunity to “*capture the consonance (or dissonance) between plans [strategic] and their implementation [operational]*” (Day et al., 2009 p.641), while also appreciating the alignment (the *digital tapestry*) between IT and business perspectives (c.f. Bendig et al., 2022; Smith & Watson, 2019; Yeow et al., 2018) because the “*impact of DT*” on the “*business*” is “*technology-enabled*” (Porfirio et al., 2021 p.616). In fact, McCarthy et al. (2024, p.413) highlight the numerous mentions in the literature of “*the importance of a well-functioning and collaborative strategic partnership between IT and business leadership for the purpose of change adaptations throughout the DT process*”. Therefore, our approach to key informant selection allows for four types (quadrants) of practitioner voices to be heard (e.g. *Business Strategic, Business Operational, IT Strategic, IT Operational*) as we theorise about the CSFs for DT in a pre-digital organisation (*reference withheld for review purposes*). Each key informant was categorised in one of the practitioner voice quadrants based on an appreciation of the nature of their activities on a DT programme (see Figure 1). The key informants were recruited through (i) prior knowledge of, and working relationships with, practitioners currently active in a DT programme, (ii) speakers at practitioner conferences and webinars, and (iii) LinkedIn connections.

Interviews are considered the most appropriate data gathering technique for collecting rich and detailed data from industry experts (Koh and Tan., 2011) and are a typical data gathering technique with the key informant approach (Whittaker, 2012, Barker et al., 2005). In this study, we conduct a series of semi-structured interviews (four per practitioner voice type), where each key informant reveals their experiences (positive and negative) with “doing” DT. Finally, when using semi-structured interviews as part of the key informant technique, it is not uncommon to have a smaller number of interviewees (e.g. ranging from 6 to 32); however, “*it is more important to have appropriately qualified (quality) individuals participating in a study, over a larger quantity of individuals*” (Alyami et al., 2023, p.117). Therefore, we believe that our use of sixteen key informants is appropriate for stage one of this exploratory research study.

KEY INFORMANTS		ORGANISATIONAL ROLE	
		STRATEGIC	OPERATIONAL
ORGANISATIONAL PERSPECTIVE	IT	- IT Services Director - Chief Information Officer - Global Director of Digital Services Platforms - Senior Software Development Manager	- Senior Digital Solutions Engineering Manager - IT Manager - Chief Technology Officer - Lead Digital MIS Analyst
	BUSINESS	- Chief Executive Officer & VP - Director of Academic Affairs & Digital Services - Chief Information Officer & VP - Senior Global Business Transformation Director	- Business Transformation Officer - Director of Operations of Global Support Services - Business Transformation Director - Business Transformation Manager

Figure 1. The 2x2 matrix of key informants (Source: Authors' own work).

Qualitative data analysis emphasises “sense making” (Bhattacharjee et al., 2012), with coding being a widely used technique for theory building (Buchwald et al., 2014; Tallon et al., 2013). According to (Corbin and Strauss, 1990, p.67), coding “*represents the operations by which data are broken down, conceptualized, and put back together in new ways*”. This research employs an inductive approach using open, axial, and selective coding to generate concepts from field data (Walsham, 2006). *Open coding* identifies key concepts related to the phenomenon of interest, grouping similar concepts into higher-order categories (Bhattacharjee et al., 2012; Corbin and Strauss, 1990). *Axial coding*, performed concurrently with open coding, systematically refines and links these categories into relationships (Dezdar and Sulaiman, 2009; Alhassan et al., 2019). *Selective coding* then identifies a core category, from the related categories that accrued in the axial coding, and reflects back on raw data to construct a coherent narrative and generate grounded theory (Tan et al., 2015; Corbin and Strauss, 1990). Therefore, “*what coding does, above all, is to allow the researcher to communicate and connect with the data to facilitate the comprehension of the emerging phenomena and to generate theory grounded in the data*” (Basit, 2003, p.152).

For this research, the open, axial, and selective coding process took place over a 22-month period (from June 2019 to March 2021). This coding was conducted on three levels, as follows: (i) on each individual transcript (*micro*), (ii) within each quadrant (*meso*), and (iii) across all four quadrants (*macro*). There was also a reflection back to the literature during each of these coding levels. The tempo with which the key informant interviews were completed, dictated the tempo with which the coding of data progressed also. During the coding process, the research team followed ‘*collaborative reflection*’, to offer a “*diversity of perspectives*” and challenge assumptions (c.f. Olmos-Vega et al., 2022, pp.5-6). For each key informant interview, the lead author transcribed the interview and generated a structured transcript, which was then independently coded (reading the transcript sentence-by-sentence and following an inductive open coding approach) by the lead author and the 2nd author. Thereafter, the coding outputs for each structured transcript (*micro*) were compared and consolidated, following discussion. These discussions maintained the ongoing accuracy and consistency of our coding (see Figure 2 for a sample of these working document outputs).

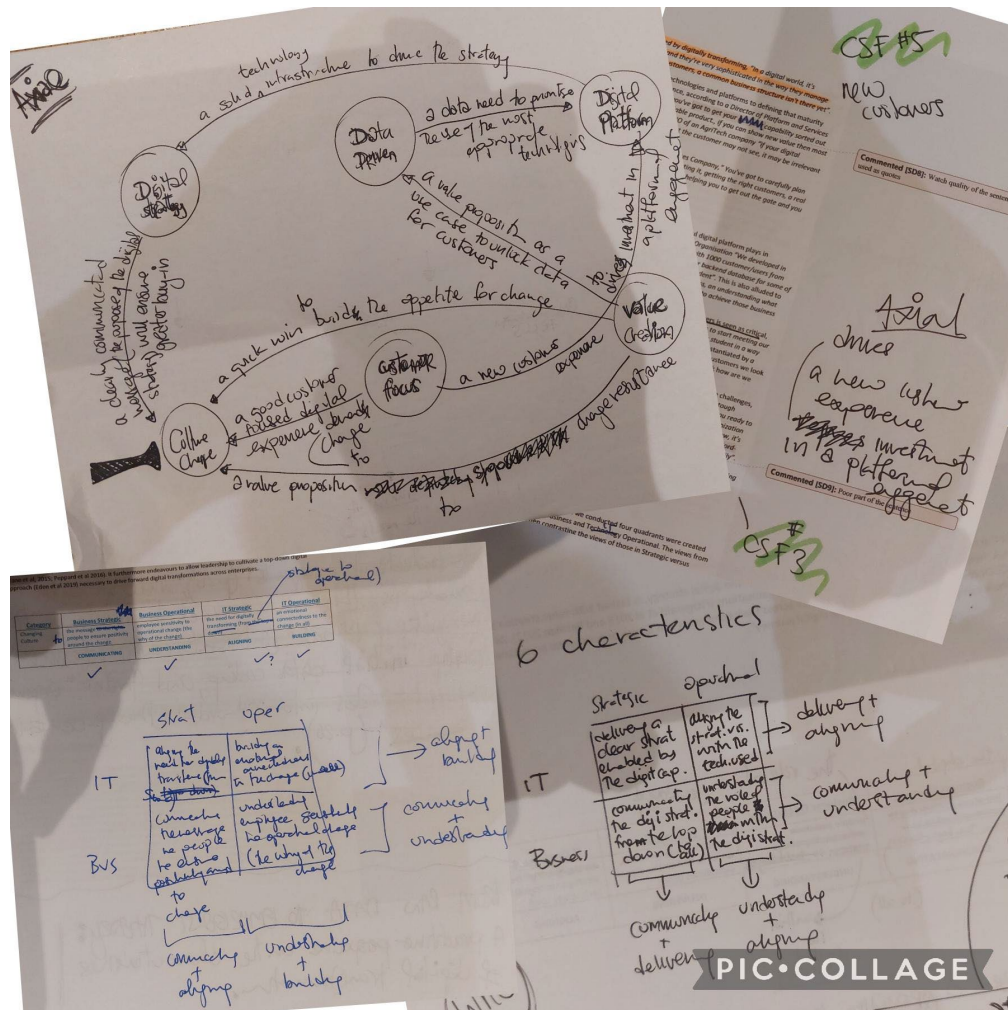


Figure 2. The emergence of the DT characteristics & the relationships (open & axial coding output) (Source: Authors' own work).

Throughout the open coding process, we frequently calculated an inter-coder reliability (ICR) estimate using the simple but “crude” approach of “direct agreements” between coders (specifically the 1st author and 2nd author) (a percentage of agreement between 0% and 100%) (c.f. Burla, et al., 2008, p.114). Our coding similarity score was usually between 75% and 85%, and 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”. Furthermore, when the tempo allowed, the four coded outputs belonging to each quadrant (*meso*) were also analysed by all three research team members. This afforded the opportunity of an external challenge (given the somewhat more ‘objective’ view of the 3rd author – having not been “in the weeds” coding each interview transcript). Finally, our constant comparative analysis efforts culminated in an analysis of all four practitioner voice quadrants (*meso*) towards the end of the 2-year period. In total, approximately 40 rounds of coding conversations took place (averaging one per fortnight) throughout the 22-month period.

During *open coding* we were initially looking for two sides of a key informant’s DT experience, namely the “what” and the “how” of “doing” DT. This simply translates as “what” action they need to take and “how” they enable that action, in their role as a DT leader. These actions are in the context of the key informant striving for the best possible outcome in a DT initiative. The output from our open coding produced 95 concepts from 348 key informant excerpts. After coding the first two interviews, *axial*

coding (the second reading of the data) was commenced in an iterative manner (as categories started to emerge) in order to identify and clarify the relationships between the emerging categories. During this iterative process, similarities and differences among the categories emerged thus reducing the number of categories to 14 (emerging from the 95 concepts). For the purposes of this paper, we leverage the six most frequently occurring categories (DT characteristics), as follows: *Digital Strategy*, *Customer Focus*, *Culture Change*, *Digital Platform*, *Data Driven*, and *Value Creation* (see Figure 3). A more detailed discussion on these DT characteristics is provided in (*reference withheld for review purposes*).

As part of axial coding, we explore the relationships and connections between the categories emerging from open coding. Therefore, we identified nine relationships of significance between the six most frequently occurring categories (DT characteristics) emerging from open coding. See Table 1 for an illustration of our axial coding supporting the emergence of CSF#1 (the relationship between '*Digital Strategy*' and '*Culture Change*'). These six categories and the nine relationships between them are shaped by all four practitioner voice quadrants.

KI	Key Informant Coded Excerpt	Concept	Category	Relationship
BS	you have a vision of what your future digital capabilities are going to be like as is outlined in your digital strategy	underpin the strategy with digital capabilities	Digital Strategy	A Clearly Communicated Message (the Purpose of the Strategy) to Ensure Buy-In (CSF#1)
ITS	you've got to underpin the digital capabilities that will make that happen, that's obviously a function that the business must carry			
BO	an understanding of what you need in place to implement your digital strategy requires the support from those in operations so that it will be successful			
ITO	an acknowledgement of what they want to transform and how they feel transforming grows the company by using digital capabilities			
BS	it thrives on support from the top of the company to create the vision and the mission of its digital future	acquire top level sponsorship for cultural change	Culture Change	
ITS	digital transformation needs executive level sponsorship for it to be successful to get through to the ranks of the organisation			
BO	you need to empower people to be bold, I think that's key as well, we're all afraid of transformation and ultimately everybody's afraid of change			
ITO	so I think it has to be a partnership, where it works, really well is where we have leadership from IT and leadership from the business coming together to set-out how the transformation will be implemented			
Business Strategic (BS), IT Strategic (ITS), Business Operational (BO), IT Operational (ITO)				

Table 1. Sample coding of the relationship between the categories for CSF#1 (axial coding) (Source: Authors' own work)

Finally, our efforts at *selective coding* allows us to tell a compelling theorising story around the outputs (the nine CSFs for DT in a pre-digital organisation – see Figure 4). As part of selective coding, we identified the 'core category' (the category with the most relationships – in our case that is '*Culture Change*') and also justified the rationale behind its selection (where the other categories

directly/indirectly influence and are influenced by the core category). Once the conceptual model (Figure 4) of the CSFs for DT in a pre-digital organisation was in a '*fit for consumption*' state, it was shared with some of the 16 key informants, involved in stage one, who expressed an interest. The sharing of these grounded theorising outputs also led to a number of follow on conversations, with a number of these key informants, where the *importance* (c.f. Rosemann and Vessey, 2008) of the outputs was high (relative to their current efforts on their respective DT initiatives). We view this research output sharing as a form of member checking, thereby, enabling key informants to review and potentially confirm or challenge the interpretations made, enhancing the credibility and trustworthiness of the findings. Furthermore, sharing the outputs demonstrates respect for each key informant's time and stories. It fulfills an ethical obligation to reciprocate by involving them in understanding how their experiences have contributed to the grounded theorising outputs and the overall research project. In the next section we present stage two of our exploratory research approach.

3.2 Stage Two

We undertake stage two of this research to corroborate 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 the "*trustworthiness*", "*interpretability*" and "*meaningfulness*" of our results (Greene et al., 1989, p. 259). In stage two of this exploratory research study, we adopt a 'request for comment' (RFC) process (c.f. Chen, et al., 2013) to evaluate the value of the grounded theorising output. This is in line with other grounded theorising studies, for example, Sammon et al. (2024) use the RFC process to examine the plausibility of a ChatGPT4-generated coding output, while Alyami et al. (2024) use the RFC process to evaluate the ranked importance of their eleven CSFs for SETA programme effectiveness. We adopt a similar approach to Alyami et al. (2024) and Nah et al. (2001) by rolling out a short simple survey questionnaire to facilitate the evaluation of our CSFs, and "*how the perceived importance of these factors may differ*" among respondents (Nah et al., 2001, p. 295). Therefore, to further elevate the relevance of our work, we also evaluate the *importance* (c.f. Rosemann and Vessey, 2008) of each of the nine CSFs through engaging with 30 DT leaders across 10 different organisations. These 30 DT leaders are subject matter experts (SMEs) representing practitioners who have lead DT initiatives.

It is argued that online surveys are an effective way "*to elicit feedback from a wide range of participants in a scalable way*" (Lo, et al 2015, p.416). In fact, surveying practitioners (using short simple surveys) to determine (i) their confidence in academic outputs or (ii) their perception of research relevance is a common practice (c.f. Kitchenham and Pfleeger, 2008). However, it is important to design these surveys such that participants require "*as little effort as possible to complete it*" (Lo, et al 2015, p.416). To achieve this, we designed a short 9-question survey (1 question per CSF using an ordinal scale of high (*essential*)/medium (*useful*)/low (*not necessary*); there was also an optional open-ended question) to independently gather practitioner perspectives on the ranked importance of each of the **CSFs for DT in a pre-digital organisation** (stated as follows: *please rank the importance of this CSF*) based on their experiences to date (see Appendix B for a sample survey question). Therefore, we limited our response type to numerical (ordinal scale) but subjective data, capturing the respondent's preferences (c.f. Kitchenham and Pfleeger, 2008, p. 67).

In effect, we viewed the short survey as a data gathering instrument that would provide numerical descriptions of the importance of each CSF (based on respondent experiences to date). In our survey, a respondent was required to answer all nine questions to submit a valid survey response (an optional free-text question was also provided). This requirement ensured that each respondent evaluated each one of the nine CSFs. The survey responses were gathered over an 11-month period (from June 2022 to April 2023). The survey was designed on MS Forms and was distributed electronically to practitioners (DT leaders). These practitioners were initially invited by email, and if they agreed to participate were then sent the link to the survey. None of the 16 key informants from stage one were invited to participate in stage two. Once the survey was closed and the data were downloaded to MS Excel, the number indicating '*essential*' for each CSF was determined. Leveraging the insights from the 30 DT leaders'

responses, we establish content validity, by calculating Lawshe's content validity ratio (CVR) for each CSF. As a result we produce a ranked list (descending) of CSFs for DT in a pre-digital organisation based on perceived importance (see Table 2).

In this study, the more DT leaders who perceive a CSF to be '*essential*' (e.g. beyond 50%) then the greater the degree of content validity (c.f. Ayre and Scally, 2013). The CVR proposed by Lawshe (1975) "*is a linear transformation of a proportional level of agreement on how many "experts" within a panel rate an item "essential" calculated in the following way:*

$$CVR = \frac{n_e - (N/2)}{N/2}$$

where CVR is the content validity ratio, n_e is the number of panel members indicating an item "*essential*," and N is the number of panel members" (Ayre and Scally, 2013, p.79). Ayre and Scally (2013, p.85) provide a simplified table of CVR critical values (including the number of experts required to agree an item is essential). Using this table, we can establish that with 30 DT leaders, an item achieving a score of .33 or above (e.g. at least 20 DT leaders viewing the CSF as high) can be considered "*essential*". See Appendix C for our calculations.

As with the 16 key informants, the 30 DT leaders represent the four quadrants of practitioner voices (Business Strategic [10], Business Operational [8], IT Strategic [9], and IT Operational [3]). Furthermore, their years of experience are evenly distributed across three ranges ('<5 years' [9], '5-10 years' [10], and '>10 years' [11]) in the area of business/IT transformation across a variety of sectors (e.g. Financial Services [12], Technology [11], Higher Education [5], Aviation [1], and Brewing [1]). When we compare this ranked list of the nine CSFs (based on the evaluation of the 30 DT leaders) to the initial prioritised list (based on our coding of the 16 key informants), we are presented with several interesting observations which further advance the relevance of our work to practice. This prioritised ranking of the CSFs (see Table 2) also affords us the opportunity to evaluate the conceptual model (see Figure 4) and represent CSF#6 and CSF#7 in gray as they are deemed "*not necessary*". This ranking further inspires our thoughts around three key patterns, namely: (i) *Fostering a Change-Ready Culture for DT Success*, (ii) *Building a Robust Digital Platform for Enhanced Customer Experiences*, and (iii) *Integrating Data Insights & Digital Capabilities for Value-Driven Transformation*. These observations are presented and discussed throughout the next section.

DIGITAL STRATEGY		ORGANISATIONAL ROLE	
		STRATEGIC	OPERATIONAL
ORGANISATIONAL PERSPECTIVE	IT	<u>delivering</u> a clear strategy (what) enabled by the digital capabilities (how)	<u>aligning</u> the business / digital strategic visions with the technology used
	BUSINESS	<u>communicating</u> the digital strategy from the top down (to all)	<u>understanding</u> the role of people within the digital strategy

CUSTOMER FOCUS		ORGANISATIONAL ROLE	
		STRATEGIC	OPERATIONAL
ORGANISATIONAL PERSPECTIVE	IT	<u>designing</u> customer-centred services using a suitable digital platform	<u>supporting</u> (effective) customer engagement through a digital platform
	BUSINESS	<u>creating</u> a digital experience for target sets of customers	<u>translating</u> the needs of customers into digital touchpoints

CULTURE CHANGE		ORGANISATIONAL ROLE	
		STRATEGIC	OPERATIONAL
ORGANISATIONAL PERSPECTIVE	IT	<u>aligning</u> the need for transforming digitally (from the top down)	<u>building</u> an emotional connectedness to the change (in all)
	BUSINESS	<u>communicating</u> the message to people to ensure positivity around the change	<u>understanding</u> employee sensitivity to change (the why of the change)

DIGITAL PLATFORM		ORGANISATIONAL ROLE	
		STRATEGIC	OPERATIONAL
ORGANISATIONAL PERSPECTIVE	IT	<u>designing</u> foundations for a digital platform to enhance digital experiences	<u>implementing</u> technologies to solve a defined business problem
	BUSINESS	<u>delivering</u> the business vision using appropriate technologies	<u>improving</u> business operations with the right blend of technology

DATA DRIVEN		ORGANISATIONAL ROLE	
		STRATEGIC	OPERATIONAL
ORGANISATIONAL PERSPECTIVE	IT	<u>building</u> digital capabilities to source purposeful business data	<u>capturing</u> high quality data for business use
	BUSINESS	<u>designing</u> a data strategy to extract value from data use	<u>interpreting</u> what the data is saying from the business context

VALUE CREATION		ORGANISATIONAL ROLE	
		STRATEGIC	OPERATIONAL
ORGANISATIONAL PERSPECTIVE	IT	<u>demonstrating</u> how the exploitation of technology translates data into value	<u>leveraging</u> technology to enable effective ways of working
	BUSINESS	<u>translating</u> data into value propositions (for key stakeholders)	<u>measuring</u> the value delivered to customers (and all stakeholders)

Figure 3. The six defining characteristics of DT in a pre-digital organisation (open coding output)(Source: Authors' own work).

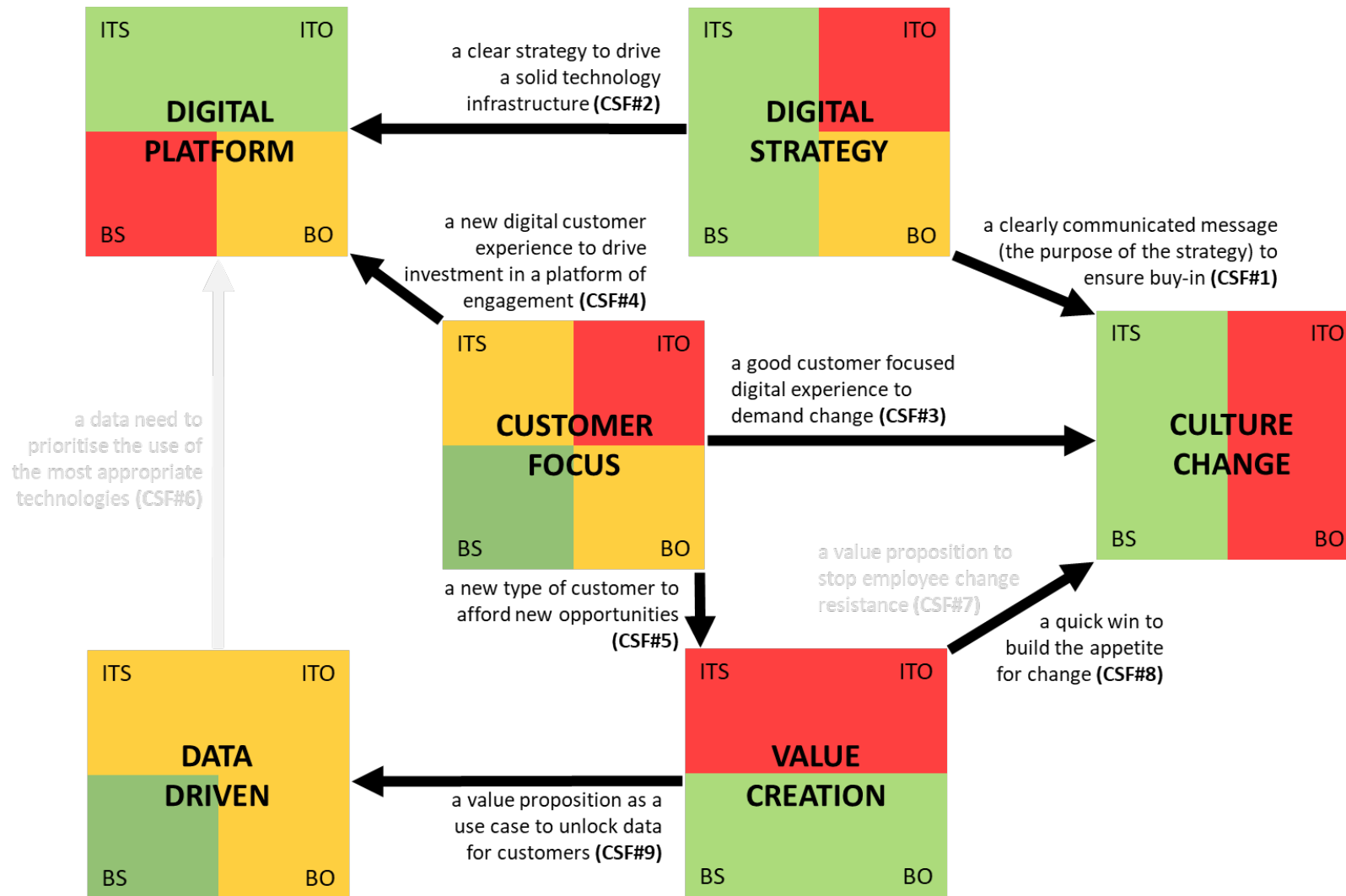


Figure 4. A conceptual model of the CSFs for DT in a pre-digital organisation (selective coding output – post-stage two evaluation) (Source: Authors' own work).

Rank	Critical Success Factor (CSF)		CVR
	Description	Focus	
1	CSF#3: a good customer focused digital experience to demand change	successful DT necessitates prioritising customer-centric digital experiences, requiring organisations to adapt and innovate continuously based on customer needs and feedback	.8
2	CSF#1: a clearly communicated message (the purpose of the strategy) to ensure buy-in	successful DT hinges on integrating a well-defined digital strategy with a cultural willingness to embrace change, supported by leadership that inspires buy-in across all organisational levels	.67
3	CSF#8: a quick win to build the appetite for change	successful DT needs value creation through quick wins in order to foster a culture open to change, requiring clear communication and executive support to align strategic and operational levels	.6
4	CSF#4: a new digital customer experience to drive investment in a platform of engagement	successful DT hinges on creating engaging digital customer experiences through a focused digital platform, fostering closer customer relationships and driving organisational innovation	.53
=5	CSF#2: a clear strategy to drive a solid technology infrastructure	successful DT relies on aligning a strategic digital vision with the development of a robust digital platform, ensuring that technology choices and investments are closely tied to the organisation's overall objectives	.4
=5	CSF#9: a value proposition as a use case to unlock data for customers	successful DT leverages data-driven approaches to unlock and analyse customer data to create customer-focused business value and competitive advantage	.4
7	CSF#5: a new type of customer to afford new opportunities	successful DT prioritises customer focus and value creation by aligning digital capabilities with evolving customer needs and preferences, thereby generating enhanced value and opportunities for both new and existing customers	.33
8	CSF#7: a value proposition to stop employee change resistance	successful DT fundamentally depends on an organisation's ability to foster a culture that embraces change, improvement, and new opportunities, alongside effectively communicating the value proposition to mitigate resistance	.27
9	CSF#6: a data need to prioritise the use of the most appropriate technologies	successful DT leverages the right digital platforms to collect, analyse, and interpret high-quality data, providing essential insights for organisational improvement and decision-making	.13

Table 2: Evaluation of the CSFs for DT in a pre-digital organisation (responses of 30 DT Leaders) (Source: Authors' own work).

4 Findings & Discussion

In this section we present the nine CSFs for DT in a pre-digital organisation. These CSFs are presented in order of importance based on the frequency of mention of the six DT characteristics (*Digital Strategy* [85 coded excerpts], *Customer Focus* [62 coded excerpts], *Culture Change* [46 coded excerpts], *Digital Platform* [38 coded excerpts], *Data Driven* [30 coded excerpts], and *Value Creation* [27 coded excerpts]). These prioritized defining characteristics emerge from our open coding of the sixteen practitioner voices, as presented in (*reference withheld for review purposes*). See Figure 3 for a visual representation of these DT characteristics. To show the distribution of the key informant excerpts (across the practitioner voice quadrants) for each DT characteristic, we use a RAG colour scheme to make it visually obvious. Each colour represents a % of the total coded excerpts for that characteristic (e.g. green >30%; amber <=30% and >15%; red >15%). So, for *Digital Strategy*, with 85 coded excerpts: 28 (33% - green) associated with *Business Strategic* (BS), 27 (32% - green) associated with *IT Strategic* (ITS), 17 (20% - amber) associated with *Business Operational* (BO), and 13 (15% - red) associated with *IT Operational* (ITO).

4.1 The Six Defining Characteristics of “doing” DT

As a result of our open coding efforts, each of the six defining characteristics of DT are described as follows:

1. *Digital Strategy* is concerned with delivering a clear strategy (what) enabled by the digital capabilities (how), communicating the digital strategy from the top down (to all), aligning the business / digital strategic visions with the technology used, and understanding the role of people within the digital strategy.
2. *Customer Focus* is concerned with designing customer-centred services using a suitable digital platform, creating a digital experience for target sets of customers, supporting (effective) customer engagement through a digital platform, and translating the needs of customers into digital touchpoints.
3. *Culture Change* is concerned with aligning the need for transforming digitally (from the top down), communicating the message to people to ensure positivity around the change, building an emotional connectedness to the change (in all), and understanding employee sensitivity to change (the why of the change).
4. *Digital Platform* is concerned with designing foundations for a digital platform to enhance digital experiences, delivering the business vision using appropriate technologies, implementing technologies to solve a defined business problem, and improving business operations with the right blend of technology.
5. *Data Driven* is concerned with building digital capabilities to source purposeful business data, designing a data strategy to extract value from data use, capturing high quality data for business use, and interpreting what the data is saying from the business context.
6. *Value Creation* is concerned with demonstrating how the exploitation of technology translates data into value, translating data into value propositions (for key stakeholders), leveraging technology to enable effective ways of working, and measuring the value delivered to customers (and all stakeholders).

As illustrated in Figure 3, the eight business-oriented practitioner voices dominate the *Value Creation* conversation, whereas the eight IT-oriented practitioner voices dominate the *Digital Platform* conversation. The eight more strategic-oriented practitioner voices dominate the *Digital Strategy* and *Culture Change* conversations. Finally, the Business Strategic quadrant (four practitioner voices) dominate the *Customer Focus* and *Data Driven* conversations.

4.2 The Nine CSFs for DT in a Pre-Digital Organisation

Based on our analysis (driven by our axial coding efforts) some interesting patterns emerge regarding the nature of the relationships between the six DT characteristics. The *Customer Focus* characteristic is the single most important factor (having an impact on three other characteristics). Whereas, the *Culture*

Change characteristic is the most impacted, with four relationships, involving three characteristics, impacting on it. Furthermore, the *Digital Platform* characteristic is also impacted by three other characteristics. Finally, the *Value Creation* characteristic has an impact on two other characteristics; however, more specifically, *Value Creation* has a significant impact on *Culture Change* (with two relationships). We now present the nine CSFs for DT in a pre-digital organisation. Each CSF defines the relationship between two DT characteristics.

4.2.1 CSF#1: A Clearly Communicated Message (the Purpose of the Strategy) to Ensure Buy-In

This CSF defines the relationship between *Digital Strategy* (ranked 1st on coded frequency) and *Culture Change* (ranked 3rd on coded frequency). Ultimately, an understanding of the *Digital Strategy* is critical, as enterprise-wide disruption from “doing” DT can only happen where a willingness to change (*Culture Change*) for the “right vision” exists. The view also exists that getting buy-in when “doing” DT requires leadership, that brings something different, a freshness, new ideas and invigorates the entire organisation (captured in the *Digital Strategy*). For example, a Business Strategic key informant suggests that “*people need to know what they're buying into, they need to know what they're investing in, they need to see a coherent way of putting that together and understand the benefit of doing it*”. While another Business Operational key informant simply states “*companies don't transform, people transform companies, so if the people aren't on board, it's not going to happen, or its going to take a lot longer. People must understand why they're transforming*”. Therefore, while *Culture Change* needs to be sponsored and driven from the executive and senior leadership, it also needs to be conveyed in a manner where buy-in from those in operational roles, who may have reservations about the benefits from DT, will be forthcoming. Therefore, the importance of getting the right type of people for your organisation, so that they positively influence its evolution, is critically important. Furthermore, allowing the message to transcend to people in your organisation also embodies a positive culture. As one of the Business Strategic key informants suggests “*people must fit the culture of your organisation and must be entertained and excited by the change*”.

4.2.2 CSF#2: A Clear Strategy to Drive a Solid Technology Infrastructure

This CSF defines the relationship between *Digital Strategy* (ranked 1st) and *Digital Platform* (ranked 4th). This CSF outlines the importance of creating a clear and coherent *Digital Strategy* to drive a solid technology infrastructure (enabling the choice of the appropriate technologies to be incorporated into a *Digital Platform*) which will be required for successfully “doing” DT. For example, as one of the IT Strategic key informants suggests “*start by aligning the business strategy, then see how digital becomes a key enabler for it*”. Furthermore, according to another IT Strategic key informant “*digital transformation is about painting a vision, getting the leaders of the organisation bought into the vision, thereby helping them to manage, to change, and to get the full value from technology*”. While the IT Strategic key informants speak of DT as beginning with designing the “right” *Digital Strategy*; they do so in order to understand what digital capability investments and initiatives are needed to deliver the transformation. From an IT Strategic perspective, identifying how your digital capabilities can deliver your strategic digital vision is fundamental. They also emphasise that aligning the business strategy and digital strategy (at both strategic and operational levels within the organisation) is a must when “doing” DT. Therefore, for Strategic key informants, investing in the “right” technologies and aligning these technologies and innovations with the organisation’s objectives (*Digital Strategy*) are seen as key to a reliable and resilient *Digital Platform*. As commented by one of the IT Strategic key informants “*so we're building huge capability where we're transforming our operational backbone to make ourselves fit for purpose in a digital sense*”. Furthermore, intrinsically important in a *Digital Strategy* is having a strategic vision, as highlighted by an IT Strategic key informant “*I would say you have to have a vision of what your future digital capability is going to be; furthermore, digital strategy enables the appropriate technology to be incorporated to deliver a successful digital transformation*”.

4.2.3 CSF#3: A Good Customer Focused Digital Experience to Demand Change

This CSF defines the relationship between *Customer Focus* (ranked 2nd) and *Culture Change* (ranked 3rd). This CSF outlines how a good customer focused digital experience to demand change is important for successfully “doing” DT. The focus on the customer should be clear and evident before an organisation decides on “what they need to change” as part of their transformation. For example, one of the Business Strategic key informants suggests that “*organisations must be customer driven, to the degree that you need to continually and formally measure where people are in terms of the transformation*”. The importance of being able to create and build a digital experience for the customer is further outlined by a Business Strategic key informant, suggesting “*we expect our customers to praise us because of the good job we do and the strong relationship we have that helps the customer to buy more; but, to create this digital experience that the customer desires, you have to be continuously innovative with your existing products for your present customer needs*”. Therefore, creating new digital channels of engagement with customers, strengthening relationships and enhancing the customer digital experience, while also expanding customer segments and ensuring customer prioritisation, are all critical elements of DT. This is supported by one of the Business Operational key informants stating that “*we are trying to be more agile in our approach, using various customer touchpoints and understanding what the customer wants, and we operate in two-week sprint cycles to adjust to the needs of the customer*”. Furthermore, as commented by one of the IT Operational key informants “*creating that digital experience means changing the ways you approach your customers*”.

4.2.4 CSF#4: A New Digital Customer Experience to Drive Investment in a Platform of Engagement

This CSF defines the relationship between *Customer Focus* (ranked 2nd) and *Digital Platform* (ranked 4th). This CSF outlines how a new digital customer experience to drive investment in a platform of engagement is core to the success of “doing” DT. When “doing” DT, the importance of being customer-oriented (*Customer Focus*) and providing a digital customer experience is significant if the organisation wants the customer to engage with them and embrace the digital outputs (*Digital Platform*) as it takes shape. For example, an IT Strategic key informant states that “*organisations will have to setup internal innovation teams to build platforms, and this will be conducive to securing incremental gains over time, through getting closer to their customers*”. Furthermore, a Business Strategic key informant highlights “*to get complete context and situational awareness that you can manage, build collaboration and communication tools that allow you to manage the engagement, whatever it might be; so, you know who's doing what, who's communicating to whom, who's collaborating on it, and who needs to know about what the status of it is*”. In fact, these strategic practitioner voices also suggest trialing the digital outputs (*Digital Platform*) with the most trusted customers, so that the organisation has an “early adopter customer advocate” that will act as a catalyst and point of reference for other customers. In effect, showcasing a positive digital experience to customers will increase buy-in to what the organisation is doing. For example, as commented by one of the IT Operational key informants “*we're more focused on understanding what customers are trying to do within their businesses and how we can use technology to help them to achieve those business objectives*”. Furthermore, IT Operational key informants highlight the emergence of the ‘cloud customer’ and how the importance of digitalization and creating a *Digital Platform* will facilitate a more substantive engagement with this customer base (*Customer Focus*). As stated by one of the IT Operational key informants “*when we looked at transforming significantly from standard systems to what I would call ‘cloud systems’, we now call them ‘cloud customers’*”.

4.2.5 CSF#5: A New Type of Customer to Afford New Opportunities

This CSF defines the relationship between *Customer Focus* (ranked 2nd) and *Value Creation* (ranked 6th). The importance of being customer-oriented (*Customer Focus*) and providing a digital experience, where the benefits to the customer (*Value Creation*) are increased through digital capabilities is key when “doing” DT. This CSF outlines how DT brings new opportunities from new customer engagement;

therefore, creating value for customers, new and old, needs an alignment between *Customer Focus* and *Value Creation*. For example, a Business Strategic key informant states that “*our customer needs are changing very rapidly, and we, as an organisation, need to be able to respond to those. So, we need to consider how we actually hear and gather our customer requirements, and also how we respond to those and how we deliver on what they're looking for*”. Considering how DT affects customers requires an understanding of the diversity of the customer base and the changing needs of these customers. The key informants refer to being agile in approach, using various touchpoints in getting a greater understanding of what it is the customer wants and adjusting to the needs of the customer. While IT Operational key informants highlight the emergence of the ‘cloud customer’ and how the importance of digitalization and creating a *Digital Platform* will facilitate a more substantive engagement with the customer base and will afford the customers the opportunity to see the *Value Creation*. Being customer centric means not only having “an understanding of” but having the where with all to “respond to” the changing needs of customers. Key for the customer is how an organisation can create new value and opportunities - provide them with a “value proposition”. For example, IT Strategic and Business Operational key informants refer most often to the “*younger generation*” or “*digital natives*” as the “*new customer type*”. One IT Strategic key informant suggests that this new customer type is “*very sophisticated in the way they manage their relationships through online channels (interacting using digital platforms)*”. Furthermore, a Business Operational key informant states that “*we need to be aware that customers are now open to digital engagement. Engagement relationships are changing with the younger generation, the ‘new customer’. They want to engage with pharmacies/ doctors in the same way they engage with 4 Star Pizza (e.g. use an app to do an e-prescription straight to the pharmacy)*”.

4.2.6 CSF#6: A Data Need to Prioritise the Use of the Most Appropriate Technologies

This CSF defines the relationship between *Data Driven* (ranked 5th) and *Digital Platform* (ranked 4th). This CSF presents data as a pointer or a compass (an illustrator of how the organisation is performing). Being able to capture data from sources that present themselves to the organisation is a key feature when “doing” DT. The importance of using the “right” technologies (*Digital Platform*) to capture, analyse and interpret ‘high quality’ data, in order to provide insights (*Data Driven*) on the current state of the organisation and how it can be improved, is at the core of DT. For example, an IT Strategic key informant highlights that “*at the end of the day, data is the real measurement of what you got right or wrong, and so without data, you're blind*”. Furthermore, an IT Operational key informant states that “*all kinds of technology generate data, and digital platforms give us the means to capture the data, also deep dive into the data and interpret the data properly*”. Therefore, there is a need to tell the story with data. These key informants view the purpose of what the organisation wants from the data and where the organisation are getting the data from as key; while also focusing on using the most appropriate technologies to ensure that the data are secure and always available to organisational business units. There is also significant support for the importance of the timeliness of data gathering and analysis. As an IT Strategic key informant highlights “*you can spend your life creating dashboards, creating reports, etc., but, you know, people are wanting real time data and they're only looking at it once a week, so it's got to be informative and giving them what they want*”. Another IT Strategic key informant suggests that “*IT will be trying to lobby for good data and identifying sources to provide it, from good business process practices, so you get good data which will be used to drive your decision outputs*”.

4.2.7 CSF#7: A Value Proposition to Stop Employee Change Resistance

This CSF defines the relationship between *Value Creation* (ranked 6th) and *Culture Change* (ranked 3rd). This CSF outlines that how organisations embrace new cultural and behavioral changes is core to successfully “doing” DT. In effect, a key factor in being able to implement a successful DT, is the organisations ability to strive for improvement and to embrace new opportunities and to be ready to attract new talent. The importance of stating a value proposition (*Value Creation*) for stakeholders across the organisation and especially in functional areas that struggle to see the benefits of DT is critical, as it can stop some of the change resistance (*Culture Change*) that DT may create in an organisation. For example, a Business Strategic key informant states that “*people must fit the culture of your organisation*”.

and must be oriented to evolving it". Therefore, going through the process of changing an organisation's culture so that it assists the implementation of DT is core to that transformation journey and is seen as a critical determining factor as to whether it is successful or not. As commented by one of the Business Operational key informants *"you need to empower people to be bold, I think that's key as well, we're all afraid of transformation and ultimately everybody's afraid of change"*. While another Business Operational key informant comments that *"every employee in the organisation needs to emotionally connect with the transformation, not just understand the need, but are actually excited by doing it"*.

4.2.8 CSF#8: A Quick Win to Build the Appetite for Change

This CSF defines the relationship between *Value Creation* (ranked 6th) and *Culture Change* (ranked 3rd). Being able to demonstrate "the how" of *Value Creation*, through achieving *quick wins*, is of critical importance when "doing" DT as it fosters an appetite or willingness for change (*Culture Change*). Changing the culture requires creating an openness to ensure that there is connectedness between management and employees alike. This requires both support and sponsorship from the executive level so that it can transcend from the strategic level to the operational level. For example, a Business Strategic key informant states that *"you've got to be able to distil the messages that people can consume and latch onto, and understand the kind of mission that they're on"*. However, the IT strategic key informants also highlight that *Value Creation* can be achieved by creating revenue opportunities through technology-enabled organisational change (*Digital Platform* and *Culture Change*). As commented by one of the IT Strategic key informants *"you can create a true demonstration of what a transformation means, the value of it, through quick wins and showing them what other companies are doing"*. Indeed, the IT Strategic and Operational key informants refer most often to finding *"low hanging fruits"* or *"quick wins"* and their importance to *"build credibility"* and *"feed into long-term plans"*. For example, one IT Strategic key informant provides an example of a 'quick win' where they were *"building an online portal to handle payments for transcript requests, turning a 4/5 week wait into 2/3 days"*. However, an IT Operational key informant warns that *"quick wins, where you paint lipstick on the pig, or do window dressing, are not desirable; 'quick wins' must provide momentum"*.

4.2.9 CSF#9: A Value Proposition as a Use Case to Unlock Data for Customers

This CSF defines the relationship between *Value Creation* (ranked 6th) and *Data Driven* (ranked 5th). Being able to unlock data for customers, through purposeful and compliant analysis, (*Data Driven*) will deliver customer-focused business value (*Value Creation*); therefore, this CSF highlights the organisational imperative to be data-driven when "doing" DT. This entails identifying the appropriate technologies required to gather, analyse, and measure the data in a meaningful way so that it can be presented to decision makers in order to extract value for the organisation: [1] in how it can guide the DT initiative, and [2] in how it can create a competitive advantage. For example, one Business Strategic key informant highlights that being data driven is difficult and is based on an assumption *"that you can get at the data, and you've got some ingestion methodology to extract value from the data, for your digital transformation"*. In fact, one of the IT Strategic key informants also suggests that *"it's the holy grail of what you want, to unlock data for customers and translate that into a value proposition, as they tend to see the value very quickly"*. However, another IT Strategic key informant states that *"90% of data is still not in the cloud. It's still stuck in 'on premise' systems within companies, so there is a long way to go yet to unlock data"*. Furthermore, the importance of using data to extract value for the organisation, when "doing" DT, is also highlighted by a Business Strategic key informant who suggests that *"you need to gather your data, analyze it and make efficient use of it in real time. As one of our experts once said, you wouldn't put a query into Google today and wait until Monday for the answer. So you want to extract business value from it quickly in a compliant way"*. In essence, how organisations engage with customers, through their data, to improve their own competitive advantage, and to create a viable value proposition for their customer base, through enhancing their customer experience, expanding their customer segments, and ensuring customer prioritisation, is core to this CSF.

4.3 Evaluating the Conceptual Model of CSFs for DT

Examining Table 2, we can identify a number of differences in the the prioritised/ranked order of the CSFs for DT, emerging from a comparison of stage one (16 DT leaders) and stage two (30 DT leaders). Of most interest is the importance placed on **CSF#8** (*a quick win to build the appetite for change*) and **CSF#9** (*a value proposition as a use case to unlock data for customers*) by the 30 DT leaders surveyed in stage two. Furthermore, building on our selective coding efforts and incorporating the evaluation of the nine CFSs by the 30 DT leaders (to further elevate the *relevance* of our work), we now present three key patterns informed by our generation and evaluation of the conceptual model (Figure 4). These patterns are as follows: (i) *fostering a change-ready culture for DT success* (**CSF#3**, **CSF#1**, **CSF#8**), (ii) *building a robust digital platform for enhanced customer experiences* (**CSF#2**, **CSF#4**), and (iii) *integrating data insights & digital capabilities for value-driven transformation* (**CSF#9**, **CSF#5**).

4.3.1 Fostering a Change-Ready Culture for DT Success

As highlighted in the conceptual model (Figure 4), the ‘Culture Change’ required for successful DT within pre-digital organisations is heavily influenced by three pivotal strategies: prioritising customer-centric digital experiences (**CSF#3**), integrating digital strategy with a willingness to embrace change (**CSF#1**), and fostering value creation through quick wins (**CSF#8**). Strategising around these CSFs underscores the importance of aligning organisational efforts towards a digital-first mindset that is responsive to customer needs and feedback. By centering the digital experience around the customer, organisations can drive a culture that is continually adaptive and innovative, ensuring that digital initiatives are not only relevant but also deeply connected to the evolving expectations of their customer base. Furthermore, integrating a well-defined digital strategy with an organisational culture that is open to change necessitates leadership that can inspire and garner buy-in at all levels. This approach to DT emphasises the critical role of leadership in communicating the vision and benefits of digital initiatives, thereby building a sense of purpose and urgency around the need for transformation. Such leadership acts as a catalyst for culture change, bridging the gap between strategic objectives and the collective willingness of the organisation to move in a new digital direction. Moreover, the emphasis on achieving quick wins as a means of demonstrating value creation plays a crucial role in fostering an organisational culture that is receptive to change. By delivering tangible results early in the transformation journey, organisations can build credibility and engender trust amongst employees. This strategy not only aligns the strategic and operational aspects of DT but also addresses the emotional and psychological aspects of culture change. It ensures that employees understand the rationale behind the transformation, see the immediate benefits of change efforts, and feel emotionally connected to the organisation’s digital evolution. As a result, strategising around these three CSFs forms a comprehensive approach to managing culture change, ensuring that it is not just a byproduct of DT but a deliberate and integral part of the journey towards becoming a digitally mature organisation.

4.3.2 Building a Robust Digital Platform for Enhanced Customer Experiences

As highlighted in the conceptual model (Figure 4), the strategic alignment of the ‘Digital Strategy’ and the ‘Digital Platform’ is crucial, as it ensures that technology choices and investments are not made in isolation but are directly linked to the organisation's core objectives and strategic ambitions. The influence of this alignment on the concept of ‘Digital Platform’ is profound, as it emphasises the need for designing digital foundations that not only enhance digital experiences (**CSF#4**) but also deliver on the business vision (**CSF#2**). The successful leveraging of the right ‘Digital Platform’ to collect, analyse, and interpret high-quality data not only facilitates the enhancement of digital experiences but also supports the delivery of the business vision. By focusing on the implementation of technologies that address specific business problems, organisations can create a digital platform that acts as a cornerstone for innovation and operational excellence. Moreover, the critical role of a digital platform in creating engaging digital customer experiences underscores the importance of fostering closer customer relationships and driving organisational innovation. This focus highlights the need for a digital platform to be customer-centric, ensuring that every technological enhancement or introduction serves to improve

the customer journey, increase engagement, and solidify customer loyalty. In this context, the digital platform transcends its role as a mere technological infrastructure to become a dynamic ecosystem that supports continuous innovation, adapts to changing customer needs, and provides actionable insights for further improvement. Finally, in essence, the influence of aligning the strategic digital vision with the development of the digital platform shapes the foundation for a future-ready organisation. It demands a thoughtful consideration of how technologies are selected and implemented, ensuring they contribute to solving business challenges and enhancing operational efficiency. The focus on creating compelling digital customer experiences further amplifies the value of the digital platform, making it a pivotal element in achieving a sustainable DT and driving forward the organisation's innovation agenda.

4.3.3 Integrating Data Insights & Digital Capabilities for Value-Driven Transformation

As highlighted in the conceptual model (Figure 4), the interconnectedness of customer focus, value creation, and digital capabilities forms the backbone of a successful DT. For example, in a successful DT, digital capabilities not only meet the evolving customer needs and preferences but also enhance value and opportunities for both new and existing customers (CSF#5). This approach underlines the essence of 'Value Creation' in the digital era, showcasing how the strategic exploitation of technology and data translates into compelling value propositions for stakeholders. It emphasises the need for organisations to leverage technology not just for efficiency but as a means to deliver measurable value to customers, thereby creating a competitive edge and fostering loyalty (CSF#9). Simultaneously, the emphasis on leveraging 'Data-Driven' approaches to unlock and analyse customer data highlights the necessity for organisations to build robust digital capabilities that enable the sourcing of purposeful business data. Designing a data strategy that extracts meaningful value from this data becomes a cornerstone of DT, enabling businesses to capture high-quality data and interpret it in a way that informs strategic decision-making and operational improvements. Overall, these influences collectively underscore the intricate relationship between 'Value Creation' and 'Digital Platform' in the context of DT. They illustrate how a strategic focus on customer-centricity and data analysis can drive an organisation towards achieving significant improvements, competitive advantage, and sustainable growth.

4.4 Positioning the Conceptual Model of CSFs for DT

The evolution from IT-enabled transformation to digitalization has significantly influenced how organisations change and adapt. The evolution from previous IT-enabled transformation eras (1960s-2000s) to the digitalization era (2010s-2020s) has continually reshaped how organisations adapt and transform. To position our conceptual model of CSFs for DT in a pre-digital organisation we reflect our work onto the conversation in a subset of 'seminal and highly cited' research papers (over the past 60+ years). As presented in Table 3, we position each of our nine CSFs against a subset of ten 'seminal and highly cited' research papers (we identify two research papers per era). This affords us the opportunity to provide a snapshot of the uniqueness of our grounded theorising work, for example, (i) the relevance of two specific CSFs across all of the IT-enabled transformation eras (1960s-2020s), and (ii) the relevance of two specific CSFs in the digitalization era (2010s-2020s). Furthermore, as presented in Table 3, there is good support in the literature for our CSFs (our emerging categories) across the eras. However, these studies discuss some, but not all, of these CSFs for DT in a pre-digital organisation. As a result of this reflection on a snapshot of 'seminal and highly cited' research papers, the uniqueness of this study (the conceptual model of CSFs for DT) still holds and represents the most comprehensive coverage (in a single research study) of the factors critical to the success of a DT initiative in a pre-digital organisation.

The late 1960s and 1970s marked a pivotal era for technology in organisations, beginning with the adoption of Mainframe Systems. These systems were instrumental in aligning IT with strategic business objectives, emphasising IT as a strategic resource to facilitate change. The emphasis on building an effective IT Strategy was critical, and was designed to enhance IT performance, reduce costs, and improve operational efficiencies, while also positioning IT as a key enabler of business success (King,

1978; Gorry & Scott Morton, 1971). Organisations aimed to leverage these Mainframe Systems to transform and gain a competitive edge. Thereafter, the 1980s marked a significant shift in IT's role, evolving from a leverage mandate to a more transformative function within organisations. The emergence of end user computing (EUC), particularly with the advent of personal computers, revolutionised the work environment, making technology more accessible and dynamic. The distributed IT architecture provided a robust technological foundation, enabling employees to leverage a wider range of applications and improved connectivity. Again, success required a balanced and well-aligned Business and IT strategy. This alignment ensured that appropriate technologies supported business goals, enhancing the value and variety of services. As a result, organisations achieved cost savings and delivered greater value propositions (Porter & Millar, 1985; Ward, 1987). These advancements laid the groundwork for integrating IT capabilities with strategic business transformation.

The 1990s marked a period of accelerated organisational transformation driven by rapid technological advancements and greater integration of applications, infrastructure, and processes. The rise of the ICT sector, coupled with widespread adoption of innovations, such as Enterprise Resource Planning (ERP) and Data Warehousing, enabled the development of robust, IT-enabled platforms. These platforms were supported by Client/Server technology, representing a significant departure from the 1980s. During this decade, IT continued to play a critical role in achieving strategic business objectives and gaining competitive advantage. The 1990s also highlighted the strategic importance of data, and organisations leveraged advancements like ERP and Data Warehousing to capture and analyse data, driving informed decision-making and increasing organisational agility. This data-driven approach allowed for improved customer relationships and value creation (Henderson & Venkatraman, 1999; Rockart, 1986).

The 2000s marked the adoption of service-oriented architecture (SOA), positioning IT applications and services as strategic enablers for organisational transformation. Business process reengineering through digitization became a core objective, requiring a digital strategy that all stakeholders could understand and support. During this period, Business and IT alignment matured, with advancements like cloud computing enhancing infrastructure. Organisations also shifted toward customer-centric approaches, where improved IT architecture enabled better customer engagement, driving value through agile methods and technological innovations. The decade also highlighted data as a critical enabler of transformation, with a focus on data usability and informed decision-making. As customer-centricity grew, delivering products and services with a clear competitive advantage became vital. This era underscored the importance of adapting behaviours to maximise technological improvements and leverage agile approaches for transformative value delivery (Gal-Or et al., 2008; Kim et al., 2007).

The transition to the current period of digitalization and digitally transforming (2010s-2020s) marks the rise of digitally enabled organisations, characterised by DT involving big data, analytics, cloud computing, mobile technologies, and social media to enhance customer offerings. A clear and cohesive digital strategy, supported by emerging technologies, is crucial. Like prior IT-enabled transformations, success depends on aligning technology, processes, data, and people, with strategic goals communicated throughout the organisation. Again, this era of transformation focuses on delivering a superior customer experience, where improved digital platforms created new engagement channels. This approach opens opportunities, creating value and unlocking data-driven benefits. Such organisational change requires widespread enthusiasm and cultural adaptation, to foster a digital culture and prioritise data-driven strategies. Therefore, a well-designed data architecture enables informed decision-making, enhancing customer needs and strategic outcomes (Piccinini et al. 2015; Vial 2019). This period also highlights the ongoing rising levels of maturity of digitalization in organisations (from 2020 onwards) focusing on the emergence of key relationships forged between technology, strategy and organisational structures, presenting a holistic view of DT (Escobar et al., 2023). Furthermore these relationships illustrate the necessity of good governance, efficient resource allocation, and data quality (for data-driven decision-making), in driving a successful DT initiative (Gurcan et al. 2023, Kraus et al. 2021).

Time Period Era	1960s -1970s		1980s		1990s		2000s		2010s - 2020s			
	Mainframe Systems		End User Computing		Client/Server Architecture		Web Oriented Architecture		Digitalization & Digital Transformation			
	Gorry & Scott Morton (1971)	King (1978)	Porter & Millar (1985)	Ward (1987)	Rockart et al. (1996)	Henderson & Venkatraman (1999)	Kim et al. (2007)	Gal-Or et al. (2008)	Vial (2019)	Piccinini & Hanelt (2015)	Alojail et al. (2023)	Al Maazmi et al. (2024)
CSF												
CSF#1 A Clearly Communicated Message (the Purpose of the Strategy) to Ensure Buy-In.			X		X		X		X	X	X	X
CSF#2 A Clear Strategy to Drive a Solid Technology Infrastructure	X	X		X		X		X	X	X	X	X
CSF#3 A Good Customer Focused Digital Experience to Demand Change							X		X		X	X
CSF#4 A New Digital Customer Experience to Drive Investment in a Platform of Engagement										X	X	X
CSF#5 A New Type of Customer to Afford New Opportunities					X	X		X	X	X	X	X
CSF#6 A Data Need to Prioritise the Use of the Most Appropriate Technologies (<i>not essential</i>)						X		X	X	X	X	X
CSF#7 A Value Proposition to Stop Employee Change Resistance (<i>not essential</i>)								X	X		X	X
CSF#8 A Quick Win to Build the Appetite for Change										X	X	X
CSF#9 A Value Proposition as a Use Case to Unlock Data for Customers	X		X			X		X	X	X	X	X

Table 3: CSFs for DT in a pre-digital organisaiton across the IT-enabled transformation eras (Source: Authors' own work)

4.4.1 CSFs across the IT-Enabled Transformation Eras (1960s-2020s)

Based on the positioning of our CSFs across the eras, we identify two CSFs that are present in each era and closely aligned throughout, namely: (CSF#2: *a clear strategy to drive a solid technology infrastructure*) and (CSF#9: *a value proposition as a use case to unlock data for customers*). These CSFs underscore the importance of aligning strategic objectives with the right technology while delivering compelling value propositions.

During the early IT-enabled transformation eras (1960s-2000s), the emphasis was on using IT to enhance operational efficiency and align technology with business goals (Henderson & Venkatraman, 1993; Gorry & Scott Morton, 1971). This alignment boosted the variety and value of IT services, contributing to cost savings and stakeholder benefits (Porter & Millar, 1985; Ward, 1987). As Rockart et al. (1996, p.12) suggest “*the value of any infrastructure depends on management's strategic vision... the design of the infrastructure and the amount invested into it*”. IT thus evolved from a supporting function to a strategic enabler, facilitating organisational transformation and improving customer value.

The ongoing digitalization era (2010s-2020s) builds on these earlier foundations, where CSF#2 (*a clear strategy to drive a solid technology infrastructure*) underpins this strategic vision. Furthermore, as Vial (2019, p.7) suggest “*digital business strategy is organizational strategy formulated and executed by leveraging digital resources to create differential value*”. Therefore, CSF#9 (*a value proposition as a use case to unlock data for customers*) emphasises continuous transformation and customer-centricity, requiring organisations to adapt and innovate through agile, technology-driven approaches (Gal-Or et al., 2008; Kim et al., 2006). As a result, the digitalization era (2010s-2020s) advances the role of customer-centricity in transforming an organisation. This era further highlights the need for all parts of the organisation to be enthusiastic about be willing to change functionally or enterprise wide through the “*exploiting new digital technologies to innovate consumer experience and create more value for the organization*” (Piccinini 2015, p.11).

4.4.2 CSFs in the Digitalization Era (2010s-2020s)

Our research has identified two specific CSFs that are particularly relevant in the digitalization era (2010s-2020s), namely: (CSF#4: *a new digital customer experience to drive investment in a platform of engagement*) and (CSF#8: *a quick win to build the appetite for change*).

The digitalization era emphasises enhanced customer engagement through integrated technology platforms, offering more flexible and diverse connection points. CSF#4 (*a new digital customer experience to drive investment in a platform of engagement*) emerges as crucial, given the profound impact of digital technologies on consumer behaviour. For example, as stated by (Vial 2019, p.122) “*digital technologies have a profound impact on the behaviour of consumers who have ubiquitous access to information and communication capabilities*”. Therefore, consumers, with ubiquitous access to information, demand higher service standards and are no longer captive to traditional firm-customer dynamics (Vial, 2019). Given this “*increase in digital density*, consumers have “*greater access to information through digital channels*” and “*are more informed about different products and services*” (Piccinini 2015, p.1641). As a result, organisations must select emerging technologies carefully to build platforms that deliver valuable and engaging experiences, inspiring a new type of customer interaction to create the value propositions for these customers.

CSF#8 (*a quick win to build the appetite for change*) is essential, where initial and sustained support from stakeholders’ hinges on demonstrating tangible benefits early in the DT journey. This involves creating visible value propositions for all stakeholders, including employees, to foster buy-in. The research underscores the importance of aligning digital technologies with organisational culture and mitigating resistance by clarifying the potential benefits. For example, as stated by Vial (2019, p.130) “*resistance can also be explained by a lack of visibility on the potential benefits of digital technologies*”. Ultimately, a shared enthusiasm for change, reinforced by quick wins, energises employees and leadership, aligning their commitment with the strategic digital vision.

5 Conclusions: Implications & Recommendations

Reflecting on our analysis, and in answering the RQ posed in this paper, we present nine CSFs (seven of which are deemed “essential”) for DT in a pre-digital organisation in order to enhance organisational DT outcomes. We advance the first comprehensive conceptualisation of the CSFs for DT in such a pre-digital context (see Figure 4), through finding patterns, across the four types of practitioner voices, in what appear to be disparate accounts of “doing” DT. This model is the “*product of a long engagement with data*” (Hammond, 2018, p.5) and showcases our theorising process by “*abstracting something from the data in order to explain what is happening*” (Hammond, 2018, p.4).

These research findings contribute to IS theory development by adding to our current understanding of DT and illustrating the usefulness of CSFs when evaluating such initiatives. This research also provides managers with a “*CSF-based recipe*” (see Figure 2) for achieving “*transformation investment outcomes*” which will also “*increase the perceived usefulness of CSFs to managers in general*” (Sammon and Adam, 2008, p.13). While these CSFs may appear generic or obvious in-and-of-themselves, it is the relationships between the CSFs and their combined impact, which organisations must understand and focus upon. As argued by (Sammon and Adam, 2008) this is particularly important if an organisation is “*striving to produce outcomes in-line with those expected from a transformation investment*”. Therefore, we view this work as an important first step towards the creation of a set of conceptual elements that can inspire the community of practice in DT. To conclude, it is hoped that this research will promote a *focal awareness* versus a *subsidiary awareness* (c.f. Hammond, 2018, p.6) amongst scholars and practitioners with regards to what is important when “doing” DT in a pre-digital organisation. It is also hoped that it will help practitioners to avoid the hidden traps in their decision making (e.g. *status quo trap*, *sunk-cost trap*, *overconfidence trap*, etc.) (Hammond et al., 1998) and keep focus on the CSFs that will increase the likelihood of a successful DT outcome.

So, what does our work mean for DT in a pre-digital organisation? We propose that for DT leaders, it’s trying to get the composition of the DT process right; finding a balance so that DT delivers a successful outcome across the organisation. We appreciate that Digital Transformation (DT) is difficult in practice as it involves ‘getting the idea’ of what DT is all about packaged together, and communicated to all levels of the organisation, so that the benefits and value are apparent and visible to all. Furthermore, DT leaders must consider the importance of a digital culture, seeing it as a significant part in the enablement of the digital strategy, and also key in demonstrating value creation to employees and customers alike. Therefore, getting the necessary buy-in that comes from an ‘enthusiasm’ and a ‘willingness’ from employees across the organisation is a top priority for DT leaders. Finally, DT leaders need to build out a digital architecture and create a digital platform that will provide the foundation for achieve a successful DT outcome.

5.1 Implication for Theory & Practice

Similar to (Rosemann and Vessey, 2008, p.3) 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 argue, given our methodological approach to this research, that the CSFs for DT in a pre-digital organisation are provided “by practitioners, 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 DT efforts. There is no doubt that DT is a current hot topic and a top concern for many practitioners (both business and IT). However, the ability to lead a DT initiative, and be successful in doing so, is an area of IS research not yet well established. Therefore, the work presented in this paper is an effort at addressing this current shortfall. For example, through simply undertaking a self-assessment exercise on the *presence* or *absence* of the CSFs (presented in Figure 4), a DT leaders’ 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 “doing” DT). Finally, to further increase the relevancy of this work (around *accessibility* and *applicability*) the CSFs for DT in a pre-digital organisation are ordered by criticality (based on the outcome of our theorising work). To note, as per (Rosemann and Vessey, 2008, p.3) *accessibility* is understood as “*the research is understandable, readable, and focuses on results*” and *applicability* is understood to be “*whether it provides guidance and/or direction, and whether it provides concrete recommendations*” that are easy to apply in practice.

One key takeaway from the distribution of the *dominant voice* associated with each of the nine CSFs for DT in a pre-digital organisation, is the fact that the *Business Operational* practitioner voice is not perceived to be a *dominant voice* in the emergence of any of the CSFs. That is not to say that the relevance of the *Business Operational* practitioner voice is lessened, but it points to a possible imbalance in the conversation between the strategic and operational business perspective. In this research, we can see how important this alignment of strategic and operational is, when “doing” DT. So, simply stated, when it comes to “doing” DT, are we confident as IS scholars and DT leaders that we are hearing the voices of those employees classified as *Business Operational*. In particular, **CSF#7** highlights that the *Business Operational* key informants in this research make reference to everyone being afraid of change, and employees needing to be emotionally connected to the transformation. Therefore, these practitioner voices require further investigation in the context of “doing” DT. This is also interesting given that **CSF#7** (*a value proposition to stop employee change resistance*) is not deemed “essential” by the 30 DT leaders in stage two of this research.

5.2 Recommendations for Future Research

We imagine that the foundations are laid, through proposing the nine CSFs in this study, to further progress this line of enquiry by either qualitative, quantitative or a mixed method approach. In fact, there is an opportunity to look more closely at the differences in the CSFs and evaluate if they are transferable to other organisational contexts (e.g. digital start-ups). Finally, while our work presents a breadth of CSFs, more work can now be done to unpack these CSFs and look under the hood of each factor to better appreciate its role when “doing” DT in a pre-digital organisation. For example, further research on **‘fostering a change-ready culture for DT success’** could explore the methodologies and strategies that lead to the successful cultivation of a change-ready culture within organisations embarking on DT. This includes examining case studies of organisations that have effectively managed cultural shifts, identifying best practices in leadership, communication, and employee engagement strategies that foster adaptability and innovation. Additionally, research could delve into the psychological and sociological aspects of change resistance, providing insights into how organisations can better prepare their workforce for the inevitable disruptions brought about by DT. Furthermore, research on **‘building a robust digital platform for enhanced customer experiences’** could investigate the critical elements in designing and implementing digital platforms that not only support but enhance customer experiences. For example, taking account the technological, strategic, and operational considerations necessary for developing platforms that are responsive to customer needs, scalable, and secure. Key areas of exploration could include the integration of emerging technologies, the role of data analytics in understanding customer behavior, and strategies for continuous improvement and innovation on digital platforms. Finally, further research on **‘integrating data insights & digital capabilities for value-driven transformation’** could uncover how organisations can effectively integrate data insights with digital capabilities to drive value creation in their DT efforts. This could include studying data collection, analysis, and interpretation processes to inform strategic decision-making, enhance customer experiences, and achieve operational efficiencies. Further investigation could explore the challenges and best practices in aligning data strategies with business objectives, the role of technology in enabling data-driven decision-making, and measuring the impact of data insights on business outcomes and competitive advantage.

Finally, now that we have identified a number of relationships (CSFs) between the six defining characteristics of “doing” DT, there is a need to examine the “*conjunctural*” (Ragin, 1987) nature of

these characteristics and their effects on the outcome of a DT initiative. Such an appreciation would further improve our understanding regarding the complexity of DT. Moving beyond single factor analysis and away from the embryonic mindset of simple lists and classifications of CSFs would be a positive development. Being able to “chain” CSFs for “doing” DT “over time” would provide a “what led to what” (c.f. Hubberman and Miles, 1994, p.146) appreciation which would lend itself to the development of a CSFs process model of DT.

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Appendix A: Stage One – DT Leadership Interview Guide

The purpose of the interview with the key informant (DT leader) is to identify the characteristics of DT leadership required to deliver a successful DT initiative.

As part of the interview it is important to gather the following from each key informant (in their own words):

- their understanding of DT and why it's important for organisations
- their experiences in a DT role (single or multiple experiences)
- their experiences of the things that need to be done (the what & how) to deliver (as a DT leader) and a justified prioritisation of these things
- their sense of difference between strategic & operational / business & IT DT leader perspectives on DT
- their sense of the role of *people*, *process*, *technology*, and *data* within DT

Appendix B: Stage Two – Ranking CSFs Survey Questions (Source: Authors' own work)

Each of the nine CSF survey questions followed the format below (using CSF#1 as an example).

CSFs for Digital Transformation

In this section we would like to appreciate your perception of the Critical Success Factors (CSFs) for Digital Transformation (DT). In each question you will be asked to rank the importance of the CSF based on your experiences.

This section contains 9 **required** questions and 1 **optional** question.

30. **CSF#1:** a clearly communicated message (the purpose of the strategy) to ensure buy-in

CSF Focus: an understanding of the digital strategy is critical, as enterprise-wide disruption from “doing” DT can only happen where a willingness to change for the *'right vision'* exists. The view also exists that getting buy-in when “doing” DT requires leadership that brings something different, a freshness, new ideas and invigorates the entire organization (captured in the digital strategy)

Please rank the importance of this CSF *

- ☐ High
- ☐ Medium
- ☐ Low

This is the format of the optional question also.

39. **OPTIONAL QUESTION:** Based on your experiences, please provide any further information that you deem relevant around the CSFs for DT presented in this section.

Enter your answer

Appendix C: Stage Two – Lawshe Content Validity Ratio (CVR) (Source: Authors' own work)

	CSF#1: a clearly communicated message (the purpose of the strategy) to ensure buy-in	CSF#2: a clear strategy to drive a solid technology infrastructure	CSF#3: a good customer focused digital experience to demand change	CSF#4: a new digital customer experience to drive investment in a platform of engagement	CSF#5: a new type of customer to afford new opportunities	CSF#6: a data need to prioritise the use of the most appropriate technologies	CSF#7: a value proposition to stop employee change resistance	CSF#8: a quick win to build the appetite for change	CSF#9: a value proposition as a use case to unlock data for customers
high	25	21	27	23	20	17	19	24	21
medium	5	8	2	4	6	13	10	6	8
low	0	1	1	3	4	0	1	0	1
CVR	0.67	0.4	0.8	0.53	0.33	0.13	0.27	0.6	0.4
rank	2	5	1	4	7	9	8	3	5