Title: Towards Developing a Holistic Management Framework for Organizational Digital Transformation

Name: Yu, Wing Lok Garry

Supervised by: Dr. Ko, Anthony Chi Keung and Dr. Yu, Eddie

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ABSTRACT

Within the framework of Industry 4.0, the significance of business operations has ascended to a central and pivotal position within the continually evolving sphere of digitalization. This epoch is characterized by the synergistic integration of technologies in novel and unprecedented manners, substantially shaping the course of Organizational Digital Transformation (ODT), frequently guiding it through unforeseeable avenues. The expeditious advancement of ODT has emerged as an imperative strategic mandate for enterprises, notwithstanding the challenges posed by nascent disruptive forces that possess the capacity to upheave traditional industry sectors.

In recent decades, enterprises have progressively adopted digital solutions as a pivotal factor in securing their competitive edge. Nonetheless, a report published by the Boston Consulting Group (BCG) in 2018 underscores a disquieting truth: a notable majority, exceeding 78% of organizations, fell short of attaining their revenue generation objectives. Of particular concern, 73% grappled with deriving discernible business value from their Organizational Digital Transformation (ODT) initiatives. Even with a wealth of research findings linking the mounting incidence of ODT setbacks and complex undertakings to prevailing management methodologies, a more extensive inquiry is imperative to address this intricate undertaking comprehensively.

Yu's 3H framework, comprising the domains of *Heart, Head*, and *Hand*, represents distinct spheres of managerial decision-making that collectively inform the integration of these domains, each exerting varying degrees of influence on organizational performance. The primary aim of this exploratory study is to delve deeply into the nuanced relationship between factors contributing to ODT failures and each of the 3H domains. The data for this research was collected through various literature, focus group interviews and a questionnaire survey. In addressing the research objectives, the study revolves around critical aspects of organizational digital transformation (ODT): understanding ODT failures, identifying key ODT challenges, recognizing significant H domains for ODT, crafting a comprehensive ODT management framework, and effectively

managing the identified domains.

This exploration seeks to elucidate a strategic trajectory conducive to the success of Organizational Digital Transformation (ODT) efforts. This investigation postulates the intricate interdependence among these domains by synthesizing insights derived from extant literature, employing the 3H framework as a theoretical construct. It pinpoints essential pathways for organizations to traverse the intricate hurdles associated with digital transformation adeptly. The result of these findings is the conceptualization of a comprehensive management framework. This framework, structured and informed by the study's insights, empowers organizations with a systematic approach to effectively navigate the intricate landscape of ODT. In turn, it fosters the successful implementation of ODT initiatives and bolsters organizational resilience in the face of evolving technological paradigms and disruptive forces.

RESUBMISSION

DECLARATION

This work has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree.

Signed ..... Yu, Wing Lok Garry ..... (candidate)

Date ..... 23 December 2023 .....

STATEMENT 1

This thesis is the result of my own investigations, except where otherwise stated. Where correction services have been used the extent and nature of the correction is clearly marked in a footnote(s). Other sources are acknowledged by footnotes giving explicit references. A bibliography is appended.

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STATEMENT 2

I hereby give consent for my thesis, if accepted, to be available for deposit in the University's digital repository.

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DEDICATION

I dedicate this thesis to my family for their love and support, my friends, and mentors for their guidance, and in memory of a loved one who inspired me. This work is also dedicated to all those who believe in the power of education to impact the world positively. Thank you for being a part of this journey.

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GLOSSARY

AWS	Amazon Web Services
B2C	Business-to-Consumer
BCG	Boston Consulting Group
BPR	Business Process Reengineering
BSC	Balanced Scorecard
CAGR	Compound Annual Growth Rate
CBV	Competence-based View
CFA	Confirmatory Factor Analysis
CMB	Common Method Bias
CRM	Customer Relationship Management
DBSC	Digital Sustainable Balanced Scorecard
DCV	Dynamic Capability View
DT	Digital Transformation
DTS	Digital Transformation Strategies
DX	Digital Strategy
ERP	Enterprise resource planning
ESG	Environment, Social, and Governance
ESMM	Exploratory Sequential Mixed Method
FPI	Financial Performance Indicator
FTEs	Full Time Employees
HTML	Hypertext Media Links
IoT	Internet of Things
KPIs	Key Performance Indicators
KSFs	Key Success Factors
OCM	Organizational Change Management
ODT	Organizational Digital Transformation

OEQ	Open-ended Question
POS	Point of Sale
RBT	Resource-Based Theory
RBV	Resource-based View
ROI	Return on Investment
SaaS	Software as a Service
SHR	Single Hierarchical Regression
SPSS	Statistical Package for the Social Sciences
S&P	Standard & Poor’s
VMV	Visions, Mission, Values
TSR	Total Shareholder Return
WWW	World Wide Web

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CHAPTER ONE – INTRODUCTION

1.1 Background

In the organizational digital transformation (ODT) realm, the success or failure of such endeavors hinges upon a multitude of interrelated factors that necessitate careful examination. Esteemed scholar George Westerman, Senior Lecturer at the MIT Sloan School of Management, aptly described the transformative potential of ODT by likening it to the metamorphosis of a caterpillar into a butterfly. However, he also warned of the consequences of missteps, highlighting that an ill-executed transformation may result in nothing more than a swift caterpillar.

> *"When digital transformation is done right, it's like a caterpillar turning into a butterfly, but when done wrong, all you have is a fast caterpillar."*

In the face of technological advancements and evolving business landscapes, many organizations find themselves confronted with the need for substantial restructuring, changes, and repositioning of their business models and leadership practices (Burmeister *et al.,* 2016; Hanelt *et al.,* 2021). While organizations embrace digital transformation at varying stages and paces, it is evident that most still have a considerable distance to traverse (Hansen & Sia, 2015; Zhu *et al.,* 2006; Zimmermann *et al.,* 2018). ODT is a constantly evolving process driven by the innovative and unforeseeable combination of technologies that shape its trajectory (Ustundag & Cevikcan, 2017).

The ODT pertains to a comprehensive and strategic undertaking in which an organization capitalizes on digital technologies and capabilities to alter its business operations, models, and culture fundamentally. It encompasses integrating digital tools, technologies, and data-driven methodologies to stimulate innovation, enhance operational efficiency, elevate customer experiences, and attain a competitive advantage in the digital age. Digital

transformation encompasses diverse endeavors, encompassing the adoption of cloud computing, data analytics, artificial intelligence, automation, the Internet of Things (IoT), and other emerging technologies (Hanelt *et al.,* 2021). It surpasses the mere implementation of digital solutions. It necessitates a holistic approach that considers the entirety of the organization, including its processes and interactions with internal and external stakeholders.

In the business environment, organizations view their digital transformation as a *'pre-emptive attack,'* a primary market innovation strategy. This approach requires strategic technology planning under strong leadership to outpace potential industry rivals (Teece *et al.,* 1997, 2016). The goal is to establish a market presence through innovative processes and products, targeting new territories and markets. Strategic management aligns resources and capabilities with objectives to boost efficiency and competitive advantage. ODT is not a one-off project; this ongoing journey demands continual learning, experimentation, and adaptation, which primary objective is to enable organizations to adapt to the rapidly evolving digital landscape, seize new opportunities, and effectively address the challenges posed by digital disruption (Westerman, 2016). This change involves reimagining business models, redefining strategies for engaging customers, optimizing operational processes, cultivating a digital culture, and empowering employees with the requisite digital skills. Ultimately, ODT empowers organizations to transform and flourish in the digital era by harnessing the potential of digital technologies to drive innovation, enhance efficiency, and deliver value to customers (Davenport & Westerman, 2018; Zimmermann *et al.,* 2018).

Historically, organizations have embraced digital solutions, recognizing digital transformation as a significant determinant for gaining a competitive advantage. McKinsey & Company (2018) indicates a success rate of less than thirty percent across various industries. Similarly, the BCG report (2020) reveals that over seventy-eight percent of organizations failed to achieve their revenue generation objectives, while seventy-three percent struggled to deliver business value through ODT. Notably, the COVID-19 pandemic

prompted sixty-seven percent of global businesses to accelerate their digital transformation strategies (DTS), with sixty-three percent increasing financial support for ODT, as outlined in the KPMG report (2021).

Numerous authors have grappled with the complexity and challenges of ODT. Extensive research has been conducted to identify factors contributing to its success. The growing number of failure stories and projects spinning out of control, emphasizing the need for organizations to reconsider this intricate endeavor carefully (Brynjolfsson & Hitt, 2000; Markus, 2004). ODT, as its name suggests, involves the comprehensive transformation of an organization's business models, culture, and operational processes by adopting digital tools and technologies, both internally and externally (Zhu *et al.,* 2006; Hartley & Sawaya, 2019). Successful ODT relies on robust leadership, strategic foresight, organizational alignment, and the capacity to navigate the intricacies associated with technological, cultural, and operational factors, and it serves as an innovation strategy that supports business performance through the adoption of new technologies or strengthening existing ones (Davison, 2002; Hartley & Sawaya, 2019). Notably, internet, analytical, and mobile technologies have been identified as key technological drivers of digital transformation (Zhu *et al.,* 2006; Berman, 2012; Berman & Marshall, 2014). These technologies profoundly transform organizational activities, competencies, processes, and business models, improving performance. Westerman (2016) emphasizes that developing new competencies in ODT revolves around becoming more agile, people-oriented, strategic in planning, and effective in organizational culture and effectiveness, reflecting a holistic transformational journey pursued to create value.

The strategic process of ODT significantly influences the success of organizational change. This process has predictable and preventable failure factors (Allio, 2005; Hrebinia, 2006). Unfortunately, many organizations overlook the holistic significance of initial planning. Common failure factors within ODT encompass insufficient sustained commitment from top

management, inadequate support for ongoing visioning and planning, and diminished team morale and motivation during transformation (Lowe *et al.,* 1996; Miller *et al.,* 2004; Gelfand *et al.,* 2012). Effective ODT requires user involvement, proper training by suitable vendors, and alignment with prevailing organizational culture (Grover *et al.,* 1995; Zimmermann *et al.,* 2018). Teamwork, coaching, and individual competence are vital for successful digital transformation in organizations (Vinzant, 1996; Vial, 2019; Tabrizi *et al.,* 2019). Notably, digital transformation transcends technology, as a people-driven process involving integration across various dimensions like talent retention, top management support, leadership, monitoring, and control (Somers & Nelson, 2001; Hofstede, 2006).

ODT's foundation is a human-intensive process fostering interaction patterns across dimensions, focusing on talent allocation over technological capability (Holland, 1999; Sebastian *et al.,* 2020). Leadership propels business projects and mission performance (Kotter & Schlesinger, 1979; Westerman, 2016). KPMG's global survey *'Going Digital', Faster'* (2021) explores how the digital landscape compels incumbents to adopt new approaches. Organizations must draw insights from diverse dimensions to mitigate risks and enhance overall experiences.

1.2 Study Motivation

Organizational digital transformation is a prevailing global trend, impacting companies across various industries with varying degrees of speed and intensity (Markus, 2004; Fitzgerald *et al.,* 2014). While some organizations encounter initial failures during the early stages of transformation, others experience initial success only to face subsequent challenges. Overall, ODT carries significant implications for organizations engaged in general business practice as technological advancements reshape various aspects of our lives, including how consumers engage with products and services (Bharadwaj *et al.,* 2013).

Many organizations increasingly rely on a transformational mindset to foster natural

business growth, leveraging it to evolve existing systems and business models rather than merely replacing them. (Fitzgerald *et al.,* 2014). Despite the multitude of proposed definitions and strategies for ODT, the failure rate of such initiatives is at most seventy percent. In the 2021 KPMG Global survey, Miriam Hernandez-Kakol, Global Head of Management Consulting, emphasizes the persistent nature of this failure rate for further investigation and research. However, practical implementation often exposes organizations to barriers and consequences rather than offering a readily available solution framework for managing this technological change (Bharadwaj *et al.,* 2013). According to Deloitte's (2018) Global Human Capital Trends report, just 6% of organizations currently possess leaders capable of effectively navigating digital transformation complexities. In contrast, a substantial 70% of survey respondents express a strong desire for leadership development programs aimed at nurturing digital transformation-related skills. These figures underscore digital transformation's critical importance and maturity in contemporary organizations.

The need for a comprehensive management framework for organizational digital transformation is evident in professional advancement. The absence of such a guide in existing literature is a significant gap driving our research initiative. Nevertheless, lacking a tailored management framework creates a void requiring scholarly attention and practical insight. This research is a dedicated response to professional exigency, aiming to rectify disparities and uncertainties in ODT. By examining past experiences, distilling successful methodologies, and learning from failures resulting from a lack of structured guidance, the goal is to provide organizations with a tailored roadmap. Our aim is to fill an existing void in literature and empower professionals and organizations with a transformative compass, fostering resilience and strategic acumen in their digital journey.

This framework should offer actionable guidelines considering diverse factors in each digital transformation archetype. Beyond technology, digital transformation requires substantial organizational structure, processes, and culture shifts. These elements are pivotal drivers

of change and innovation throughout the transformation journey. As highlighted in the Deloitte report, the importance of a holistic management framework is underscored by the stark contrast between the existing scarcity and the high demand for digital transformation. Embracing a practical process built upon such a framework becomes crucial, providing actionable guidelines for successful implementation and ensuring a lasting competitive advantage in the dynamic digital landscape.

1.3 Organizational Change and Organizational Digital Transformation (ODT)

Organizational digital transformation (ODT) involves multifaceted changes in corporate culture, operational procedures, and the overall business model (DeLone & McLean, 1992), spurred by evolving industries and digitalized intelligent systems. Change management and strategic planning are crucial to achieving a successful ODT, encompassing critical phases (DeLone & McLean, 1992; Baer & Frese, 2003; Bharadwaj *et al.,* 2013). ODT entails reevaluating the organization's cultural fabric, embedding technological advancements, and shifting operational methods to agile digital systems (Weick & Quinn, 2004). Simultaneously, the business model transforms to align with the digital age (Brynjolfsson & Hitt, 2000; Sambamurthy *et al.,* 2003; Bharadwaj *et al.,* 2013). This orchestrated process unifies functional units for a cohesive digital transformation.

i. Organizational Change

> *"Every successful organization has to make the transition from a world defined primarily by repetition to one primarily defined by change. This is the biggest transformation in the structure of how humans work together since the Agricultural Revolution."*
> *Bill Drayton (former visiting professor at Harvard University and Stanford University)*

Organizational change within organizational development signifies transitioning from the current to the desired state to enhance efficiency and effectiveness (Fainstein, 2000; Pettigrew *et al.,* 2001; By, 2005), which entails processes like strategic planning, operational methods, structural adjustments, technology, and cultural transformation, influencing the

organization over time (Tsoukas & Chia, 2002; Burnes, 2004). Organizations, akin to living organisms, undergo distinct life cycles: newborn, growth, maturity, and decline (Hannan & Freeman, 1984; By, 2005; Mento *et al.,* 2002). Internal and external factors influence each stage, prompting the need for change (Burnes, 1996; Tsoukas & Chia, 2002). Evolution often demands horizontal and vertical adjustments aligning with market demands (Moran, 2000; Mento *et al.,* 2002).

Amid change, organizations confront reconciling contrasting perspectives among diverse individuals, this dialectical evolution stage highlights value differentiation, goal opposition, misaligned interests, and challenging the status quo (Gustafson *et al.,* 2003). Addressing these tensions involves exploring alternative approaches, accommodating diverse stakeholders (Weick & Quinn, 1999; Gustafson *et al.,* 2003). These dialectical factors can significantly differ from market changes, necessitating varied responses (Tsoukas & Chia, 2002; Gustafson *et al.,* 2003). Regardless of organization specifics, achieving business goals remains consistent (Hannan *et al.,* 2004; Burnes & Jackson, 2011; Ai-Haddad & Kotnour, 2015). Organizational change often begins with assessing the market position, competitive landscape, and performance (Kotter, 2012). The teleological change approach involves goal setting, implementation, evaluation, and modification, driven by stakeholders (Barney, 1991; Crossan *et al.,* 1999; Tsoukas & Chia, 2002). Organizations need clarity on goals to identify necessary actions (Javidan, 1998; Hannan *et al.,* 2003; Hrebiniak, 2006), teleological change's success rests on change agents (Bass *et al.,* 2003; Casadesus-Masanell & Ricart, 2010).

The scope and urgency of strategic goals determine organizational change's nature—gradual or revolutionary (Pettigrew *et al.,* 2001; By, 2005). Kurt Lewin's three-stage model—unfreeze, change, and refreeze—provides insights (Burnes, 2004). Unfreezing motivation change, fostering commitment and momentum, this commitment should span all units, engaging members (Burnes, 2011; Ai-Haddad & Kotnour, 2015). Emotional and normative

commitments support change more effectively than continuing commitment alone. Lack of results, communication, or decision failures can lead to unsupportive attitudes, highlighting the unfreezing phase (Burnes, 2004; By, 2005). Organizations recognize change needs, plan, integrate, and sustain which this change phase involves transitioning through problem-solving or vision-oriented approaches (Pettigrew *et al.,* 2001; Ai-Haddad & Kotnour, 2015). Refreezing establishes a new structure, culture, strategy, and systems involving behaviour (By, 2006; Jacobs *et al.,* 2013).

Organizational change is intricate and dynamic, spanning dimensions, factors, stages, and approaches (Casadesus-Masanell & Ricart, 2010). Gaining insights into corporate life cycles, managing conflicting perspectives, setting objectives, fostering commitment, and navigating phases enable organizations to prosper (Westerman *et al.,* 2012; Legner *et al.,* 2017). Conversely, digital transformation uses technology to reshape business models, processes, and interactions. It reimagines operations, uses data for insights, and creates new value, revenue streams, and advantages (Westerman *et al.,* 2015; Schallmo *et al.,* 2017; Schwarzmüller *et al.,* 2018).

Digital transformation distinctly centers on strategically integrating technologies throughout an organization. It goes beyond technology adoption; it is holistic, considering technology, people, processes, and culture (Legner *et al.,* 2017; Schallmo *et al.,* 2017). Success requires strong leadership, change strategies, cross-functional collaboration, and a culture of innovation (Westerman *et al.,* 2014; Legner *et al.,* 2017). ODT is specific to using digital tech for innovation, efficiency, and stakeholder value (Berman *et al.,* 2014). However, not all organizational change falls under digital transformation. Change can stem from various reasons, including structural, cultural, or strategic transformations (Cash *et al.,* 2003; Hannan *et al.,* 2004; Fitzgerald *et al.,* 2014). It can be triggered by market shifts, disruptions, mergers, leadership changes, or the need to comply with new regulations. Digital transformation encompasses an intricate balance between technological and organizational

aspects, while organizational change extends across diverse reasons and dimensions. Organizational change is an integral element of organizational digital transformation, encompasses a holistic overhaul of dimensions within the organization, integrating digital technologies for fundamental shifts in structures, processes, cultures, skills and change management (Parviainen *et al.,* 2017).

Sambamurthy *et al.* (2003) and Westerman *et al.* (2014) suggest that structural change is crucial in ODT, reconfiguring roles, responsibilities, and reporting lines to align with digital technology's requirements and opportunities. Process change is important too, in redesigning workflows for efficient digital tool use. It involves streamlining and automating processes that integrate solutions for enhanced efficiency and productivity, and cultural change is pivotal in cultivating digital mindsets, innovation, collaboration, and learning (Fitzgerald *et al.,* 2014). Skill development equips employees with digital competencies to navigate and leverage technologies (Baer & Frese, 2003; Vial, 2019, 2021). The effective changes in management practices are crucial too. Strategies encompass planning, communication, stakeholder engagement, and monitoring, ensuring a smooth transition throughout digital transformation (Bharadwaj *et al.,* 2013; Westerman *et al.,* 2014).

ii. Organizational Digital Transformation

Bloomberg (2018) distinguishes digital transformation (DT) from mere digitalization, noting the need to engage technology and retain workers for true transformation. Digital technology's evolution has profoundly impacted society beyond its military origins. In the late 1950s, Jack Kilby invented the microchip, marking the shift from the analogue to the digital age, termed "Digitization" (Berghaus & Back, 2016). Digitization compresses analogue data into bits, enabling limitless information transfer, dematerialization, and costless reproduction (Bloomberg, 2018). Differentiating digitization and digitalization is crucial, while the former converts are analogue to digital, the latter restructure social domains around digital

communication and media (Berghaus & Back, 2016; Bloomberg, 2018). Prior digital transformation literature often focuses on business models (Yoo, 2010; Matt *et al.,* 2015; Parviainen *et al.,* 2017; Schwarzmülle, 2017; Tabrizi *et al.,* 2019; Vial, 2019). However, digital transformation leverages tech for business model shifts, industry change, competition, and core competence sustainability (Loebbecke & Picot, 2015; Hanelt *et al.,* 2021).

Digitalization and digital transformation are closely related but distinct concepts. While both involve IT-enabled transformations leveraging information technologies to create value, digital transformation encompasses multiple dimensions that aim to create a new organizational identity, whereas IT-enabled transformation primarily focuses on supporting existing enhancements (Lucas *et al.,* 2013; Solis & Szymanski, 2017; Wessel *et al.,* 2021). To navigate the digital transformation journey successfully, organizations need to develop a digital mindset, foster a digital culture, acquire relevant skills and knowledge, and cultivate digital capabilities that enable them to effectively incorporate digital technologies and drive performance (Morakanyane *et al.,* 2017; Shaughnessy, 2018; Verhoef *et al.,* 2021). In an era characterized by globalization and evolving social trends, industries face intense competition. Therefore, organizations must accelerate their digital transformation efforts to navigate potential hazards and seize opportunities (Kotter, 2012, pp. 168-169; Hanelt *et al.,* 2021).

ODT is a strategic process where an organization leverages digital tech and capabilities to reshape operations, models, and culture (Schumacher *et al.,* 2016). It integrates tools, technologies, and data methods for innovation, efficiency, customer experience, and competitive edge in the digital era. ODT covers cloud computing, AI, IoT, and more (Kane *et al.,* 2015), surpassing mere solutions to consider processes and stakeholder interactions. Its core objective is adapting to the evolving digital landscape, capturing opportunities, and addressing digital disruption (Sebastian *et al.,* 2020), which involves business model reimagining, customer engagement strategy, process optimization, digital culture, and

upskilling (Catlin *et al.,* 2017; Tabrizl *et al.,* 2019).

Digital tech evolution has spurred innovation, software, and platforms, driving economic growth, societal shifts, and communication advances (Loebbecke & Picot, 2015; Schumacher *et al.,* 2016; Parviainen *et al.,* 2017). The Internet, especially the World Wide Web **(WWW)** in the early 1980s, enables broad access to information and global communication through Hypertext Media Links (HTML) (Berghaus & Back, 2016; Catlin *et al.,* 2017). This evolution interconnects activities, implements tech solutions, and enhances business processes (Catlin *et al.,* 2017). Digital strategy is pivotal in driving innovation, efficiency, and software/platform implementation for production, revenue, and value opportunities (Avgerou, 2001; Berghaus & Beck, 2016; Parvianinen *et al.,* 2017). As organizations embrace next-gen mobile networks, mobile tech becomes a priority, reshaping industries from projects to strategic planning (Loebbecke & Picot, 2015). Over two decades, smartphones disrupted businesses and daily life, merging digital and physical realms (Stieglitz & Brockmann, 2012; Catlin *et al.,* 2017).

Organizations must proactively undergo a digital transformation for long-term competitiveness in a rapidly evolving landscape shaped by tech advancements (Cascio & Montealegre, 2016). KPMG (2021) projects global digital transformation spending to hit $2 trillion, growing over 60% since 2016 at 16.7% CAGR. BCG (2018) finds that 30% of Global 2000 firms allocate 18% of revenue to it. Additionally, 50% prioritize transformed services, products, and experiences in the next decade. KPMG (2021) underscores the critical roles of digital giants like Google, Facebook, etc., in various activities. Digital transformation goes beyond software and systems, it is transitioning to a digital enterprise via new technologies, enabling new models, processes, and value creation (Berman, 2014; Matt *et al.,* 2015; Berghaus & Beck, 2016; Bloomberg, 2018; Sebastian *et al.,* 2020). Literature categorizes it into Process, Domain, Business Model, and Organizational Culture Transformation across industries.

Business process optimization is a pivotal strategy involving the reinvention of processes to bolster cost-effectiveness, cycle time reduction, and overall production enhancement (Berman, 2012; Berghaus & Beck, 2016). Organizations leverage cutting-edge technologies like data analytics, AI, automation, and SaaS (Software as a Service) to streamline their back-end operations, generating substantial value (Bloomberg, 2018; Bryson & Anderson, 2000; Gurbaxani & Dunkle, 2019). A prime example of this digital transformation's impact can be seen in Domino's Pizza; they established a robust IT team dedicated to internal digital innovation through strategic investments in digital capabilities. They introduced groundbreaking features such as the "*Pizza Tracker*," enabling customers to monitor their orders in real-time, and optimized their supply chain management systems to enhance cost management. Over time, Domino's continued to push boundaries. They launched a mobile ordering iPhone application and "*Pizza Anywhere*," a multi-channel ordering system spanning platforms like Google Home, Amazon Echo, and social media channels. Their innovation extended to pioneering drone deliveries in New Zealand, capturing headlines worldwide. The COVID-19 pandemic prompted the *"Domino Carside Delivery Service,"* which ensures a seamless, contactless experience for customers. These transformative efforts bore significant fruit, propelling Domino's growth from a revenue of $1.43 billion in 2008 to an impressive $4.11 billion in 2020 (National Restaurant Association, 2020). This journey underscores how digital transformation, anchored in the business optimization process, can drive remarkable outcomes in today's rapidly evolving landscape.

Amazon is a prime illustration of business scope transformation, evolving from an online retail giant into a global leader in cloud computing and infrastructure services, surpassing industry giants like Microsoft and IBM (Bloomberg, 2018; Solis, 2018). Through the development of Amazon Web Services (AWS) in just four years, Amazon harnessed digital innovation and recognized the pivotal role of data in this metamorphosis. This shift emphasizes organizations' need to grasp how technology reshapes products and services,

blurring traditional business boundaries and ushering in novel business models with considerable financial impact (HBR, 2016; Bloomberg, 2018).

Organizational culture is the bedrock of shared values and behavioural norms within an entity, wielding substantial influence over individual actions and collective attitudes (Hofstede, 2001; Burnes, 2004). It functions as a unifying force, directing behaviour towards common objectives, even amid transformative change (Kotter, 2012, pp. 156). However, when organizations undertake digital transformation, integrating new technologies often inadvertently disrupts the existing culture. This scenario frequently unfolds as new visions collide with long-established cultural norms (Weick & Quinn, 1999; Kotter, 2012). Cultivating a culture conducive to innovation and adaptability is one of the most formidable challenges for organizations, particularly concerning operational efficiency (Holland & Light, 1999; Vakola & Nikolaou, 2005). Adopting new technologies necessitates changes in processes, leadership, and employee behaviours that align with the desired cultural shift (Holland & Light, 1999; Vakola & Nikolaou, 2005). However, achieving culture change requires a collaborative effort involving various stakeholders, encompassing leaders, employees, customers, and vested parties. This collaborative process is deeply rooted in strategy, competency, and shared values, often giving rise to inherent tensions and complexities (Weick & Quinn, 1999; Holt *et al.,* 2007; Jacobs *et al.,* 2013). By embracing and managing these tensions, organizations can navigate the delicate process of cultural transformation during digital upheavals.

Organizational digital transformation represents a paradigm shift in their long-term approach to change, encompassing talent development, capability building, and business process reengineering (Fitzgerald *et al.,* 2014; Ustundag & Cevikcan, 2017). This transformation necessitates flexibility, agility, decentralized decision-making, and a greater reliance on digital technologies to establish a comprehensive business ecosystem (Davison, 2002; Westerman *et al.,* 2011, 2014a; Westerman & Bonnet, 2015; Gurbaxani & Dunkle, 2019).

Embracing digital transformation goes beyond the mere adoption of technology; it entails reshaping mindsets and organizational practices to fully leverage the opportunities presented by the digital age (Smith & Tushman, 2005; Burmeister *et al.,* 2016; Catlin *et al.,* 2017). Such a profound organizational change requires careful attention to cultural dynamics and the alignment of values, ensuring that the transformation is effectively integrated into the organization's fabric. By embracing the challenges of culture change and leveraging digital technologies, organizations can position themselves to thrive in an ever-evolving digital landscape.

Digital transformation involves a profound overhaul of an organization's technology and culture to enhance customer value and reshape the business landscape (Westerman *et al.,* 2014b). This ongoing cycle of digital-driven innovation and operational enhancements extends beyond individual firms to impact entire industry ecosystems (HBR, 2014, 2016). While technology is pivotal, acknowledging that digital transformation is inherently human centered, requiring integration across aspects like talent management, leadership engagement, and top management support (Somers & Nelson, 2001; Westerman *et al.,* 2011; Tabrizi *et al.,* 2019), is crucial. Effectively integrating these elements empowers organizations to harness resources for successful digital transformation initiatives, aiming to embrace the digital landscape and meet customer expectations in the digital era (Solis & Szymanski, 2017).

The organizational management literature on ODT highlights eight key digital technologies that have driven transformative changes: Mobile Internet (APP), Cloud Computing, IoT, AI, Social Networking, Blockchain, Digital Online Marketing, and Robotics Additive Manufacturing (Forth *et al.,* 2020b; Parviainen *et al.,* 2017; Sebastian *et al.,* 2020). By integrating these technologies into their corporate strategy, organizations can adopt flexible business models, from traditional to hybrid or fully integrated approaches, to optimize performance, efficiency, revenue, and stakeholder value (Fitzgerald *et al.,* 2014).

Organizations effectively navigate the digital landscape by leveraging core competencies and implementing functional architectures and value propositions (Westerman *et al.,* 2011; Setia *et al.,* 2013). These technologies empower organizations to adapt, seize opportunities, enhance performance, and establish sustainable competitive advantages. The researcher's conceptual framework of Organization's Digital Transformation illustrates the interplay between technologies, processes, and people (*Figure: 1*).

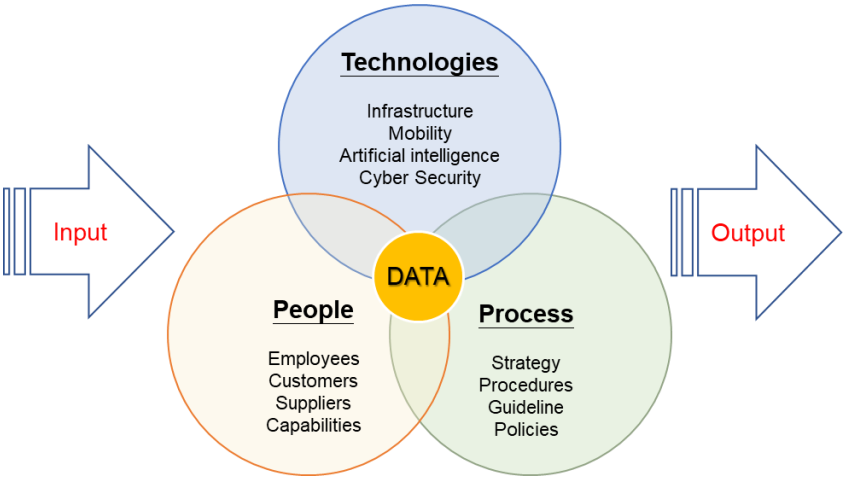

Figure 1: Framework of Organizational Digital Transformation - by author

1.4 Introducing 3H Framework

Navigating organizational change effectively is crucial (Beer *et al.,* 1990; Armenakis *et al.,* 1993; Burnes & Jackson, 2011). Despite the often-disappointing success rates of change initiatives, organizations must acknowledge that in today's landscape of economic pressures, technological advancements, and fierce market competition, the prospect of "unchanged" is equally fraught (Kotter, 2012, pp.68-74). The concept of change management encompasses a range of strategies, modifications, resource allocation, culture shifts, and behaviour adjustments aimed at elevating business performance (Pettigrew *et al.,* 2001; Appelbaum *et al.,* 2012). The Dragon Boat metaphor is a meaningful framework for understanding the dynamics of an organization (Yu, 2020, 2021). The *Heart, Head,* and *Hand* are interconnected and interdependent, much like the elements of a successful Dragon Boat

team (*Figure 2*). Effective leadership fosters a passionate Heart, strategic Head, and skilled Hand, ultimately propelling the organization towards success in the ever-changing business world.

Figure 2: The Dragon Boat as a 3H Framework in Organizational Dynamics - by researcher

Aligned with the 3H holistic management framework theoretical considerations present a comprehensive avenue to guide an organization's journey toward digital transformation. This framework integrates perspectives from leadership, organizational culture, strategic management, technology adoption, and process redesign. Doing so fosters a supportive culture, aligns digital transformation with overarching strategies, and streamlines the effective implementation of digital initiatives. By embracing the holistic framework, organizations can adeptly navigate the multifaceted intricacies of digital transformation and bolster their prospects for achieving successful outcomes.

Heart (H^1) Domain:

The Heart dimension focuses on the human aspect of digital transformation, encompassing elements such as leadership, organizational culture, and change management (Yu, 2020, 2021). Theoretical considerations in this dimension draw on theories of leadership, such as

transformational leadership and servant leadership, which emphasize the role of leaders in inspiring and guiding employees throughout the transformation process. Additionally, organizational culture and change theories, such as the Competing Values Framework (CVF), provide insights into fostering a culture that embraces innovation, collaboration, and adaptability (Yu, 2019). By integrating these theoretical perspectives, the management framework ensures that the Heart dimension is adequately addressed, fostering a supportive environment for successful digital transformation.

Head (H^2) Domain:

The Head dimension centers around the strategic aspects of digital transformation, encompassing elements such as strategic planning, organizational goals, and digital strategy formulation. Theoretical considerations in this dimension draw on strategic management theories, such as the resource-based view (RBV) and dynamic capabilities theory (Yu, 2019). RBV emphasizes leveraging organizational resources and capabilities to gain a competitive advantage through digital transformation. Dynamic capabilities theory highlights the need for organizations to build and enhance their capabilities to adapt to digital disruptions (Zott, 2003; Teece, 2007). By integrating these theoretical perspectives, the management framework ensures that the Head dimension is effectively addressed, aligning digital transformation efforts with organizational strategy and goals.

Hand (H^3) Domain:

The Hand dimension focuses on the practical implementation and execution of digital transformation initiatives. It encompasses technology adoption, process redesign and execution, performance measurement, and core competencies. Theoretical considerations in this dimension draw on technology adoption theories, such as the Technology Acceptance Model (TAM), which provides insights into factors influencing individuals' acceptance and usage of new technologies (Agha *et al.,* 2012; Foss & Saebi, 2017). Additionally, theories of

process redesign, such as Business Process Reengineering (BPR), offer guidance on redesigning processes to leverage digital technologies effectively. By integrating these theoretical perspectives, the management framework ensures that the Hand dimension is adequately addressed, enabling organizations to implement digital transformation initiatives efficiently (Yu, 2019, 2020).

Yu also suggested that the interactions among each H domain can lead the organization to various scenarios, either fulfilling the necessary and sufficient conditions for success or encountering pitfalls that hinder goal achievement. The Heart (H^1) domain emphasizes organizational fundamentals such as commitment and vision. While it interacts with the Head (H^2) domain, which focuses on strategy and management, potential pitfalls include a lack of effective execution (H^4), leading to strategic plans not being implemented correctly.

Furthermore, the interaction between the Heart (H^1) and Hand (H^3) domains can still encounter challenges, even with solid commitment and capability. That is particularly true when there's a lack of comprehensive planning and management (H^3). This situation underscores the significance of aligning enthusiasm and resources with strategic oversight, an important factor in ensuring success.

Additionally, even with well-planned and managed operations, the organization might face issues such as insufficient commitment to support these initiatives (H^2). A robust strategic plan and capable execution alone are not enough. Unwavering organizational support plays a pivotal role in driving these initiatives forward. Yu's 3H Holistic Management Conceptual framework is shown in *Figure 3* below.

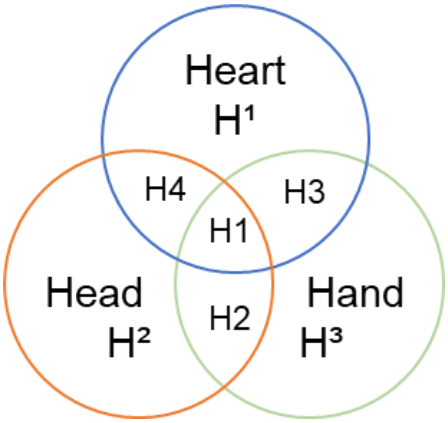

Figure 3: Yu's 3H Holistic Management Conceptual framework

1.4.1 3H Framework in ODT

The strategic significance of digital transformation (DT) lies in its capacity to address disruptive forces that fundamentally reshape traditional industries and redefine competitive landscapes (Ustundag, 2017, pp. 13–25). Organizations must adopt tailored approaches to align with their challenges and opportunities in today's rapidly evolving environment. However, many digital transformation efforts fail due to fragmented or non-holistic approaches, prioritizing isolated aspects such as technological integration or operational processes while neglecting equally critical dimensions like organizational culture, leadership, strategy, and workforce engagement. This narrow focus often results in misaligned initiatives, ineffective implementation, and failure to achieve sustainable transformation.

Existing literature has predominantly evaluated digital transformation success through financial and operational efficiency metrics, often overlooking non-financial factors such as employee engagement, customer experience, innovation capacity, and cultural alignment (Zhu *et al.,* 2006; Berman, 2012; Stone, 2018, pp. 51–74). This limited perspective exacerbates the challenges organizations face when navigating complex transformation initiatives. Organizations confront these challenges (Imran et al., 2021; Hausberg *et al.,* 2019), and a more comprehensive and integrated approach is essential, one that captures

the multifaceted nature of organizational digital transformation (ODT) and its role in achieving sustainable competitive advantage.

ODT involves significant shifts in strategic priorities, technological integration, and human capital management to build long-term resilience and adaptability (Poon & Wagner, 2001; Markus, 2005; Morakanyane *et al.,* 2020). Nevertheless, the ambiguity in defining key concepts such as organizational assets, core capabilities, digital leadership, and structural-cultural dynamics in existing literature has hindered theoretical clarity and practical application (Matt *et al.,* 2015). Many proposed methodologies fail to adequately address the interconnected nature of these dimensions, often resulting in siloed approaches that fragment efforts and increase the risk of failure (Hausberg *et al.,* 2019). Industry analyses underscore that these shortcomings are a major contributor to the high failure rates of ODT initiatives (Hausberg *et al.,* 2019; Westerman *et al.,* 2014).

The 3H framework emerges as a transformative theory to address these gaps. This holistic management approach integrates cultural, strategic, and operational dimensions into a unified framework, enabling organizations to navigate the complexities of digital transformation more effectively (Yu, 2021). The 3H framework is built on three interrelated domains: Heart, which focuses on cultural and motivational drivers; Head, which emphasizes strategic cognition and decision-making; and Hand, which addresses operational execution and resource management. By fostering synergy across these dimensions, the framework ensures that all organizational elements work cohesively, enhancing resilience and adaptability in diverse scenarios.

One of the key weaknesses of non-holistic approaches is their inability to recognize the interplay between these domains. Siloed frameworks often lead to strategic misalignment, leadership deficits, and fragmented change management efforts, undermining the success of ODT initiatives (Imran *et al.*, 2021). For example, prioritizing technology without

addressing workforce engagement or cultural transformation can result in resistance, inefficiencies, and reduced effectiveness. Conversely, the 3H framework's holistic perspective integrates leadership theories, competency management, and practical implementation to bridge these gaps, enabling organizations to cohesively align their strategies, culture, and operations.

This study adopts the 3H framework as its theoretical foundation, leveraging its integrative capacity to provide a structured approach for navigating the complexities of ODT. By offering a multidimensional perspective, the 3H framework addresses critical theoretical and practical gaps in the existing literature. It equips organizations with tools to overcome transformation challenges and achieve sustainable success. In an increasingly digital landscape, the 3H framework provides a roadmap for fostering resilience, adaptability, and long-term competitiveness.

1.5 Research Questions and Objectives

ODT's rapid advancement is critical for organizations, requiring tailored strategies to address disruptive forces in traditional industries (Ustundag & Cevikcan, 2017). Success in ODT is commonly measured through operational efficiency, financial performance, customer engagement, and new value creation (Zhu *et al.,* 2006; Berman, 2012; Stone, 2018). Reports such as McKinsey's Digital Quotient (2015) emphasize the importance of economic and operational assessment, while the BCG report (2018) highlights the role of user engagement and new revenue streams in shaping business performance.

Digital transformation has become essential for competitiveness, yet many ODT initiatives fail (Tabrizi *et al.,* 2019). This study examines key success and failure factors, providing insights into effective strategies. Addressing these gaps contributes to existing knowledge and highlights the need for a holistic management framework to navigate ODT complexities (Sambamurthy *et al.,* 2003). The findings offer practical recommendations to enhance

decision-making, refine ODT strategies, and improve implementation outcomes. Ultimately, this research aims to help organizations manage ODT challenges and achieve sustainable competitive advantage in the digital age. This study seeks to explore the complexities of ODT through four key research questions that address the core aspects of its implementation and challenges:

RQ1: What are the key success/failure factors of organizational digital transformation?

- Identify and analyze the critical success and failure factors of organizational digital transformation.
- Explores how organizations can discern pivotal success drivers, navigate obstacles, and heighten their transformational trajectories.
- Contributes to the knowledge corpus by enriching comprehension of the elements underpinning prosperous digital transformation, enabling organizations to refine their bolster positive outcomes.
- Toward to offer guidance for effective decision-making, strategy development, and execution in digital transformation.

RQ2: What are the key challenges of organizational digital transformation?

- Identify the primary challenges organizations face during digital transformation.
- Explore the obstacles encountered and understand these challenges to develop proactive strategies for managing the ODT process.
- Enhance understanding of these challenges to adopt appropriate change management methods, and risk reduction.

RQ3: What conditions are necessary and sufficient for ODT successes and why?

- Examine the Heart, Head, and Hand domains; investigate how emotion, intellect, and action collectively manage organizational digital transformation (ODT) for a holistic understanding of the digital evolution process.

- Uncover strategies and practices that empower individuals within organizations to align the human dimension – workforce skills, communication, and collaboration, with digital advancements.

- Identify critical factors and conditions that contribute to successful ODT management frameworks, offering structured and unified guidance for navigating transformation ventures.

- Aim to explore actionable insights and comprehensive strategies to enable organizations to anticipate challenges, maximize opportunities, and thrive in the dynamic digital landscape.

RQ4: How to develop an effective holistic ODT management framework?

- Identify the key dimensions and the role of cohesive change management strategies essential for successful ODT.

- Aims to develop a holistic management framework addressing the complexities of ODT and the interplay of the 3H domains.

- actionable strategies, methodologies, and best practices for effective management within the 3H domains.

- Provide organizations with practical management strategies to navigate digital transformation challenges and achieve transformational goals.

1.6 Theoretical Considerations

Integrating Organizational Change Management (OCM) literature enhances understanding of digital transformation through multiple perspectives, including organizational culture, leadership theories, and change management practices (Steelman *et al.,* 2004). This body of knowledge provides insights into the complexities of digital transformation and strategies to overcome challenges, emphasizing the urgency for organizations to adapt for competitive advantage (Berman & Marshall, 2014; Matt *et al.,* 2015). Success requires a robust framework that addresses the multidimensional nature of transformation (Hanelt *et al.,* 2021).

Yu's 3H model, Heart (culture and engagement), Head (strategy and decision-making), and Hand (implementation and resource management), offers a holistic approach to navigating these complexities. This chapter establishes a theoretical foundation by integrating diverse perspectives to shape a comprehensive management framework for digital transformation. By aligning theoretical insights with the 3H framework, the research advances understanding of ODT's multidimensional nature and provides practical guidance for organizations.

1.7 Organization of Thesis

This study of organizational digital transformation investigates the strategic adoption and integration of digital technologies within an organizational context. It explores the impact of digital tools, platforms, and data on organizational change, efficiency, innovation, and adaptation. This research aims to uncover the factors, challenges, and strategies influencing successful digital transformation initiatives, contributing to managerial practices and our understanding of digital technologies' transformative power in organizations. The organization of this thesis is as follows.

Chapter One establishes the foundation for examining organizational digital transformation by contextualizing technology’s expanding role in a competitive business environment. It defines the research problem, objectives, and guiding questions while highlighting gaps in

existing literature and the study's contributions. Additionally, the chapter outlines the thesis structure, previewing subsequent sections. This framework sets the stage for analyzing organizational digital transformation.

Chapter Two presents a comprehensive literature review and theoretical exploration to support the proposed 3H framework in organizational digital transformation. It systematically analyzes each domain, their interconnections, and architectural flow. The chapter also integrates parameters and formulas from relevant models, underscoring this study's unique contributions. It establishes a strong theoretical foundation by critically evaluating existing models and highlighting the framework's innovations. This synthesis of literature and theoretical advancements provides a robust basis for studying organizational digital transformation within the 3H holistic management framework.

Chapter Three outlines the research methodology, detailing the approach, methods, and procedures used in this study on organizational digital transformation. It systematically addresses research questions and objectives to ensure the findings' validity, reliability, and generalizability. The chapter justifies the research design, describes data collection methods, explains analysis techniques, discusses ethical considerations and provides a clear research roadmap. This chapter demonstrates the study's rigor, enabling readers to assess research credibility and robustness.

Chapter Four presents the qualitative analysis of focus group interviews on organizational digital transformation. It outlines the data collection and analysis methodology, including research design, participant selection, interview protocols, and data processing. The chapter details transcription, theme identification, and interpretation, justifying analytical techniques such as thematic analysis or grounded theory. Key findings are supported by illustrative quotes, with in-depth discussions of emerging themes and patterns. These insights are analyzed regarding research objectives, offering a comprehensive understanding of the

phenomenon studied.

Chapter Five details the methodology for collecting and analyzing quantitative data through a survey instrument in this study on organizational digital transformation. It outlines research design, including questionnaire development, target population, and sampling techniques. The chapter describes survey administration, data collection procedures, and measures for ensuring validity and reliability, such as pilot testing. Statistical analysis involves data coding, cleaning, and applying techniques like descriptive and inferential statistics, regression, or correlation analysis. Findings are presented through tables, graphs, and charts, and interpretations of research questions are made. This rigorous approach provides empirical insights, supporting decision-making, policy development, and future research.

Chapter Six presents, analyzes, and interprets research findings, aligning them with the study's objectives and methodology. Key results are examined in relation to research questions, with implications discussed within existing literature and theoretical frameworks. Unexpected or contradictory findings are addressed, and conclusions are drawn based on synthesized evidence. The chapter assesses the achievement of research objectives and proposes recommendations for future studies, acknowledging limitations. This comprehensive analysis provides valuable insights and reinforces a holistic management framework for understanding digital transformation.

1.8 General Limitations of the Research

This study has certain limitations that need to be acknowledged. These include potential issues with generalizability due to the focus on specific industries or contexts and constraints in sample size and selection. The chosen research methodology, whether qualitative or quantitative, may also have inherent limitations, such as reliance on self-reported data or biases. Timeframe and resource constraints can affect the depth and breadth of the research, while limited access to data sources or stakeholders may impact comprehensiveness.

Ethical considerations and data privacy constraints could also have influenced the study. Despite these limitations, the research provides valuable insights and lays the groundwork for future investigations in this field. It is recommended that future studies address these limitations to enhance the overall understanding of organizational digital transformation.

1.9 Chapter One Summary

The introduction chapter of this study focuses on examining the impact of management on organizational change, specifically within the context of digital transformation. The chapter begins by highlighting the significance of digital transformation in today's rapidly evolving business landscape, where organizations strive to enhance their performance and maintain a competitive edge. It introduces Yu's 3H management framework as a valuable tool for understanding and managing digital transformation processes. The chapter emphasizes the importance of aligning business objectives with digital transformation requirements and explores the role of management in driving and guiding successful transformation initiatives. By providing a comprehensive overview of the research scope, objectives, and methodology, the introduction chapter sets the stage for the subsequent chapters, laying a solid foundation for investigating the complexities of an organization's digital transformation and its management implications.

CHAPTER TWO – LITERATURE REVIEW AND MODEL DEVELOPMENT

2.1 Overview of the relevant model and Introduction

This chapter thoroughly synthesizes literature across various disciplines encompassing digital transformation, organizational change, management, leadership, sociology, and psychology. The primary thrust of this examination is the imperative for a comprehensive management framework tailored to adeptly navigate the intricate landscape of organizational digital transformation (ODT). The digital transformation process engenders significant shifts across business models, technological infrastructure, cultural dynamics, strategic paradigms, operational processes, and workforce composition.

The researcher advances the proposition of adopting an interdisciplinary approach to change management, drawing upon insights derived from digital transformation, organizational change, leadership studies, management theory, sociological perspectives, and psychological paradigms. This approach underscores the multifaceted nature of ODT, acknowledging that its successful execution demands a nuanced understanding of a multitude of factors. At its core, an exhaustive comprehension of the intricate aspects contributing to achieving successful ODT is deemed imperative. This chapter serves as a foundational cornerstone for the subsequent chapters within this study, providing a comprehensive exposition of the scholarly literature and theoretical underpinnings that underlie research into organizational digital transformation and the concomitant development of a holistic management framework. The research methodology includes utilizing diverse databases, academic journals, and search engines to systematically identify and incorporate relevant literature. The investigation evaluated pertinent literature and scholarly contributions, as detailed in (*Table 1)* of the relevant key words and (*Table 2)* of the relevant journals.

Key word	
Organizational Digital Transformation Organizational Change Management Strategy Management Resources-based View Organizational Core Competency Organization Competitive Advantage Digital Capability Organizational Culture	Transformational and Transactional Leadership Organization Behavioral Organizational Sustainability Practice Exploratory Sequential Mixed Method Balance Score Card Project Management Innovation Management

Table 1: Relevant Keywords of this study - by author

Field	Literature and Journals
Digital Transformation and Organizational Change	✧ Journal of Enterprise Transformation ✧ International Journal of innovation Management ✧ Journal of Business Strategy ✧ Management Information Systems Quarterly ✧ International Journal of Management Reviews ✧ Strategic Management Journal ✧ IEEE Transactions on Engineering of Management ✧ Journal of Change manager
Leadership and Management	✧ Harvard Business Review (HBR) ✧ Academy of Management Journal/Review ✧ Business Journal of Management ✧ Strategy and Leadership ✧ Management Science ✧ MIT Sloan Management Review ✧ International Journal of Strategic Change Management ✧ International Journal of Operations and Production Management ✧ Journal of Management ✧ Journal of Business Strategy ✧ Journal of Management Studies ✧ Journal of Management Development ✧ Journal of management accounting research ✧ Management Decision ✧ Organization Science
Sociology and Psychology	✧ Journal of Managerial Psychology ✧ Research of Organizational Behavior ✧ Psychological bulletin ✧ The journal of applied behavioral science ✧ Organization Studies ✧ Personnel psychology ✧ Human Relations ✧ Human Resource Management

Table 2: Relevant Literatures & Journals of this study - by researcher

2.1.1 Models and Stages of Organizational Digital Transformation

Digital transformation is multifaceted, encompassing technology, culture, capabilities, strategies, and value creation (Bharadwaj *et al.,* 2013). Integrating digital technologies strategically fosters change beyond expansion (Westerman *et al.,* 2014). It optimizes

operational workflow via technology, demanding strategic work process planning for success (Hickson *et al.,* 2003; Gurumurthy *et al.,* 2020). Digital transformation requires aligning business models with customers, market strategies, and profit goals (Porter & Heppelmann, 2014). Weill and Woerner (2015) presented four digital business models (*Figure 4*) as transformation blueprints. Organizations choose from these models, singularly or in conjunction with related relationships and core capabilities, to align with market dynamics and customer needs.

i. **The Supplier model** involves business through another company, it's characterized by being a low-cost producer and focusing on incremental innovation. Example as on-line insurance brokage.

ii. **The Modular Producer model** such as PayPal, thrives by providing a payment gateway for any online purchase with flexible adaptability to any system.

iii. **The Ecosystem model** exemplified by Amazon establishes a branded platform, enhances customer experiences, plug-and-pay integration, leverages consumer data, and extracts "rents" to foster ecosystem-driven growth.

iv. **The Omnichannel model** in digital transformation encompasses an integrated value chain, offering a multiproduct, multichannel customer experience tailored to life events, and strategically "owns" the customer relationship.

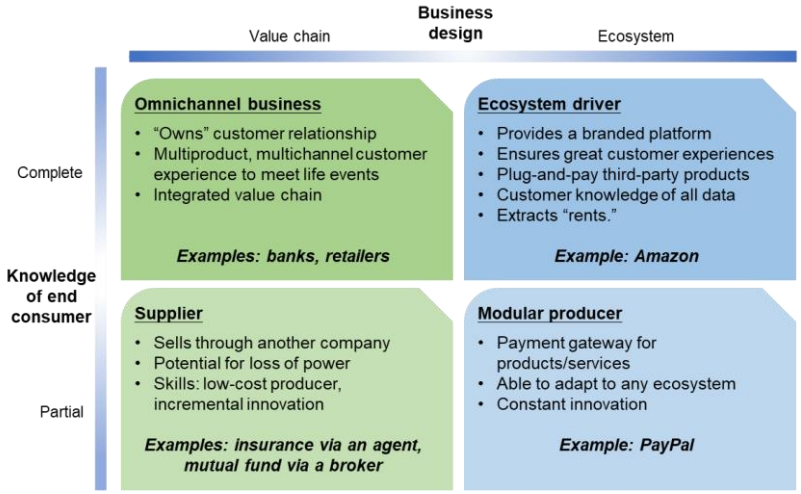

Figure 4: Four Business Models of the Digital Era Source: Weill & Woerner (2015)

ODT progresses through structured stages that align technological advancements with business objectives, fostering adaptability and sustained innovation. Organizations resemble the human body, with architecture as the skeletal system encompassing vision, strategies, rules, products, and processes (Simons, 2000; Waller, 2014). Executives leverage business architecture to guide investment decisions, integrating technology with business needs (Schermerhorn Jr *et al.,* 2002). While technology evolves rapidly, business architecture ensures alignment with value-driven objectives (Westerman *et al.,* 2012; Correani *et al.,* 2020). Digital transformation requires cross-functional collaboration and agile architectural practices (Weill & Woerner, 2013; Waller, 2014). The World Economic Forum (2016) outlines five key stages: *Goal Strategy, Digital Architecting, Planning, Execution,* and *Measurement*, aiding organizations in managing transformation complexities.

1. Goals strategy development

During the goals and strategy development stage of digital transformation, organizations assess their digital maturity, determining whether they are in the digitization or digitalization phase (Waller, 2014). This stage focuses on defining the target business model and fostering strategic discussions among transformation committees (Kyläheiko *et al.,* 2011; Weill & Woerner, 2015). For example, McDonald's CEO Chris Kempczinski implemented a 3D strategy—Digital, Delivery, and Drive-thru—expanding the digital team from 3 to over 100 members in 15 months. The *"Accelerating the Arches"* plan streamlines ordering and adapts to customer preferences, reinforcing McDonald's mission to "Feed and foster communities" (Berghaus & Back, 2016; Bloomberg, 2018). This strategy reflects post-transformation values and a sustained focus on digital innovation.

2. Digital Architect & Re-architecting

Once strategic goals are set, the next step is adapting digital architecture for desired change, creating an actionable view of business architecture to inform stakeholders about

transformation, and defining and transparently sharing process scope and digital changes are essential (Waller, 2014; Weill & Woerner, 2015). Evaluating digital strategy's impact on processes, people, technologies, and the environment is vital (Hemerling *et al.,* 2018; Correani *et al.,* 2020). An organization's internal environment, including structure, workforce, capabilities, and resources, are managed through strategy formulation, identifying strengths, weaknesses, opportunities, and threats (Burnes, 2004; Dayan *et al.,* 2017). Digital transformation leaders define process improvements with appropriate strategies and methodologies, and organizational capabilities are assessed to enhance agility and efficiency, adapting to digital changes (Westerman *et al.,* 2012). Business architects are pivotal in enabling strategy and implementation and act with three key roles: translating strategy, roadmap development, and practice management for transformation (Dayan *et al.,* 2017; Correani *et al.,* 2020).

- ***Digital architecture practice***, the workload is allocated per transformation scope, using an upstream approach to align with business goals (West *et al.,* 2004; Dayan *et al.,* 2017). However, challenges like reduced collaboration among teams and units can arise. Prioritizing upstream planning and execution over project-level focus prevents obstacles, ensuring effective digital transformation (Waller, 2014; Correani *et al.*, 2020).

- Forming a ***Multi-disciplinary Functional Team,*** this diverse group maximizes collective capabilities in executing initiatives, emphasizing alignment and collaboration (Campion *et al.,* 1996; Wolfenden, 2000). This cohesion leverages diverse skills to drive outcomes, uniting complementary expertise toward common goals and achieving desired performances (Dayan *et al.,* 2017; Correani *et al.,* 2020).

- Correani *et al.* (2020) asserted that digital transformation's success hinges on a ***Flexible and Agile Multi-talent Workforce,*** incorporating business architecture for knowledge and procedures. Individuals actively join (Dayan *et al.,* 2017; Simons, 2014, pp.

121-178). The principles and practices spread across functional units, fostering cohesiveness and consistency. Weill & Woerner (2015) stated that flexible, agile workforce enables digital adaptation, leveraging diverse skills and positioning are the right paths for digital transformation success.

3. Plan initiatives

Organizations scope the transformation's scale and develop a top-down approach with guidance, milestones, and integrated initiatives for a strategic roadmap (Kyläheiko *et al.,* 2011; Kontić & Vidicki, 2018). Initial planning outlines the budget, timeline, parties, tech aspects, actions, and chain of command. A contingency plan and measurable metrics are vital, and during initiatives, ongoing assessment is crucial for staying on track (Frankiewicz & Chamorro-Premuzic, 2020; Kyläheiko *et al.,* 2011). The digital architect guides progress assessments and suggests improvements when creating the digital transformation process, aligning capabilities and roles (Frankiewicz & Chamorro-Premuzic, 2020; Li *et al.,* 2021). Centralized teams ensure consistency but can lack alignment and implementation, and the decentralized models foster buy-in and varied solutions but might lead to fragmentation; thus, balance is the key to avoiding any losing focus (Lepak & Snell, 2002; Ilgen *et al.,* 2005; Li *et al.,* 2021).

Combining centralized and decentralized practices, the hybrid approach gains momentum in digital transformation. It leverages the strengths of both models, supported by leading sectors, centralizing process practices and standards while enabling business units to focus on their expertise and agility (Smith & Tushman, 2005; Nah & Delgado, 2006). To implement this hybrid architecture, it is crucial to establish virtual collaboration mechanisms and robust coordination across business units (Somers & Nelson, 2019; Lepak & Snell, 2002). Regardless of the chosen architecture: centralized, decentralized, or hybrid, effective coordination, communication, and transparency are imperative to drive digital transformation.

Refer to *(Figure 5)* of an illustration of the business architecture framework.

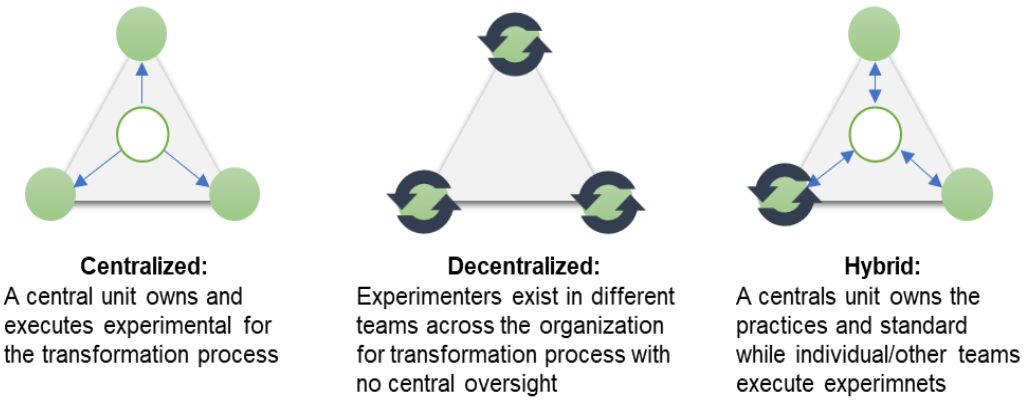

Figure 5: The architecture framework of digital transformation - by Researcher

4. Executional solution

Digital execution quality directly influences organizational transformation, requiring a structured framework for resource alignment and operational integration (Somers & Nelson, 2001, 2003; Spitzer *et al.,* 2013). Effective execution prioritizes initiatives based on impact, complexity, and organizational exposure. High-level execution demands efficient teams, tech-human collaboration, and structured upskilling to enhance adaptability. Leadership-driven action teams ensure strategic alignment, avoiding inefficiencies of bottom-up approaches (Bharadwaj *et al.,* 2013). Cross-functional collaboration, particularly with IT, addresses technological constraints and commitment inconsistencies (Sharpe *et al.,* 2006; Al-Haddad & Kotnour, 2015).

Data consolidation refines decision-making, guiding strategic initiatives through insights for revenue generation and customer engagement (Stone, 2018; Bharadwaj *et al.,* 2013). Structured data integration aids project portfolio management, emphasizing quick wins—low-effort, high-impact tasks that generate momentum and demonstrate early success (Tatum *et al.,* 2003; Frankiewicz & Chamorro-Premuzic, 2020). Long-term transformation, however, relies on high-effort initiatives requiring strategic coordination and resource

investment, driving sustainable competitive advantage (Boutetiere & Reich, 2018). Advanced digital transformation adopts agile methodologies, iterative learning, and knowledge-based interactions. Leaders transition traditional operations into digitalized processes through continuous progress reviews and adaptive strategies. Success depends on system integration, optimized infrastructure, and industry best practices, prioritizing clarity, value-driven execution, and efficiency (Morakanyane *et al.,* 2020).

While secondary tasks refine workflows and optimize collaboration, thankless tasks—high effort, low impact—can strain resources if misaligned with strategic priorities (Westerman & Bonnet, 2015). Organizations must streamline or delegate these tasks to prevent inefficiencies and resource depletion (Frankiewicz & Chamorro-Premuzic, 2020). A structured, proactive approach is essential for digital transformation. Implementing a complexity matrix categorizes tasks by impact, effort, and exposure, ensuring strategic resource allocation (Westerman & Bonnet, 2014, 2015; Buvat *et al.,* 2017). The researcher develops a Digital Transformation Complexity Matrix (Figure 6) to illustrate prioritization, exposure, and execution strategies.

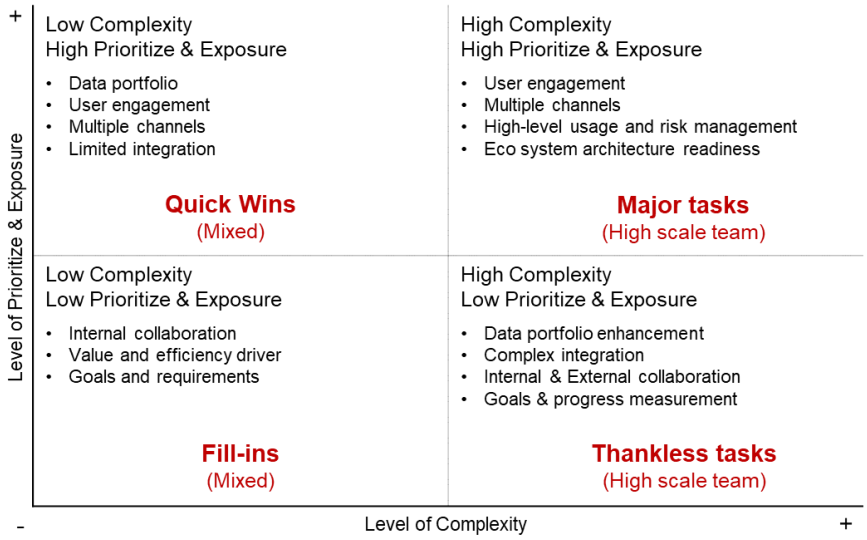

Figure 6: Matrix of digital transformation complexity versus prioritize and exposure – by researcher

5. Progress Measurement & Continuity.

Scholars stress goal-oriented performance measurement in digital transformation discourse,

Miles *et al.* (1978) suggest that a measurement framework aligned with project objectives and transformation principles is crucial. Intrinsic digital transformation attributes shape the measurement framework to enhance performance (Westerman *et al.,* 2012 Spitzer *et al.,* 2013). Each transformation process needs a purpose aligned with strategic initiatives. Evaluating and measuring process efficiency is vital, tied to task alignment and temporal distribution across phases. Performance measurement connects input effectiveness to process output, aiding goal achievement and optimal performance (Kavadias *et al.,* 2016; Bharadwaj *et al.,* 2013).

Efficiency and reliability in transformation processes are evaluated by assessing input capacities for valuable outcomes, such as key performance metrics include process reliability, throughput, first-pass yield, user satisfaction, and value-added ratios (Westerman *et al.,* 2012). Transformative process cost assessment involves budgeting and returns on investment analysis, considering various economic dimensions. Balancing control and lean practices to ensure project success is crucial. Comprehensive process measurement covers third-party standards, regulations, safety protocols, and environmental considerations, along with risk mitigation and process maturity standards (Buvat *et al.,* 2017; Frankiewicz & Chamorro-Premuzic, 2020). Digital leaders drive best-in-class processes, securing a competitive edge for the transformation journey. Monitoring and evaluating process performance empowers leaders to make informed decisions, ensuring transformation success.

2.1.2 Organizational Digital Transformation Challenges

Modern organizations necessitate an integrated business model blending systemic and technological approaches for productive change and heightened performance (Bharadwaj *et al.,* 2013). In the face of current economic challenges, digital transformation has emerged as a viable performance-enhancing solution (Holland & Light, 1999; Parviainen *et al.,* 2017).

Acknowledging its fundamental role, organizations recognize digital transformation's potential to reshape business practices, secure long-term success, attract top talent, capitalize on opportunities, establish industry leadership, and embrace the future (Poon & Wagner, 2001; Matt *et al.,* 2015; Schumacher *et al.,* 2016).

It is crucial to note that digital transformation surpasses technology adoption; it signifies an innovative, dynamic approach to business advancement (Westerman *et al.,* 2014a, 2014b; Schuchmann, & Seufert, 2015; Zimmermann *et al.,* 2018). Irrespective of size, organizations strive to evolve into digitalized entities by prioritizing strategic planning, resource allocation, efficiency enhancement, and peak performance (Catlin *et al.,* 2017; Hemerling *et al.,* 2018). While technological choice matters, it is not the sole determinant of success. The focus must be on executing transformation with strategic planning and leveraging resources efficiently for optimal performance (Bloomberg, 2018).

- **Leadership commitment from executives to middle management and digital culture mindset**

Many organizations struggle with an imitative approach to digital transformation, lacking a goal-aligned strategy (Smith & Tushman, 2005), impeding desired outcomes, and necessitating tools, expertise, and guidance for success (Smith & Lewis, 2011). Some need help keeping pace with rapid change, highlighting the need for careful considerations when undertaking digital transformation (Catlin & Willmott, 2015; Solis & Li, 2018). Commitment is vital; strategic digital initiatives correlate with industry leadership (Baker, 2021). An MIT survey indicates that approximately 70% of organizational digital transformation (ODT) initiatives fail primarily due to insufficient top management support and employee resistance. Furthermore, 62% of respondents perceive digital transformation as the sole responsibility of the CEO, while 87% prioritize digital market expansion as a key transformation objective. Notably, no other identified factor contributed to ODT failure at a rate exceeding 8%,

highlighting the predominant influence of leadership commitment and workforce engagement in driving successful transformation outcomes (Fitzgerald *et al.,* 2014). McKinsey's 2018 report states that over 54% of organizations require a digital transformation strategy, while just 16% of employees comprehend the company's digital transformation objectives. Business leadership drives 72% of digital transformation initiatives, surpassing CIO or CTO influence. Moreover, Boston Consulting Group (BCG) and Capgemini Consulting research reveals only 45% delivering partial value to the business. BCG's insights underscore the necessity of a strategic plan and methodology as foundational for success (Tabrizi *et al.,* 2019). A strategic plan is akin to a vital investment safeguard, enhancing success odds (Beer & Eisenstat, 2000; Birkinshaw *et al.,* 2008; Sousa & Rocha, 2019).

A practical approach to digital transformation requires addressing core challenges and selecting an appropriate methodology (Hannan & Freeman, 1984; Burnes, 2004). While 40% of organizations achieve success through integrated strategies that align technology with business goals and enhance competitiveness (Forth *et al.,* 2020), the remaining 60% encounter obstacles, including talent gaps, financial constraints, and inadequate monitoring systems. Leadership ensures strategic alignment and drives change (Lucas *et al.,* 2013; Kane *et al.,* 2015). Effective planning, resource allocation, and execution are critical to mitigating risks and enhancing transformation success (Fitzgerald *et al.,* 2014).

- **Deploying Talent and High-Caliber Expertise**

While team commitment and executive engagement in organizational change are recognized, middle managers, with power bases and protective instincts over their domains, tend to resist change (Berghaus & Back, 2016; Sebastian *et al.*, 2020). Automation, AI, cloud computing, and Enterprise Resource Planning (ERP) systems amplify labour reduction concerns, particularly for middle management vulnerable to dynamic models requiring

responsive compensation. Digital transformation disrupts traditional models and provokes middle management's resistance to preserving the status quo (Poon & Wagner, 2001; Smith & Tushman, 2005; Yoo, 2010). Successful digital transformation necessitates digitally minded with the skills to execute the transformation strategy (Sousa & Rocha, 2019), and innovation combines adept human resources and technologies, underlining the importance of skilled talents in overcoming transformation challenges (Buchanan *et al.,* 2005; Westerman *et al.,* 2014b). Thus, digital transformation hinges more on people than technology (Dayan *et al.,* 2017; Stone, 2018; Frankie & Chamorro-Premuzic, 2020).

Like soccer coaches seeking persistent athletes dedicated to goals, influential leaders possess pragmatism, critical thinking, resilience, perseverance, teamwork, creativity, learning agility, and emotional intelligence (DeLone & McLean, 1992). Appointing committed, skilled individuals with high potential to lead change processes is critical for digital transformation success (Davenport & Westerman, 2018). Leaders must skillfully assemble digitally literate teams, possibly drawing talent from different functional units (Bryson & Anderson, 2000; Fitzgerald *et al.,* 2004). During digital transformation, management faces time constraints due to sourcing and retaining capabilities, thus, career advancement programs can identify potential leaders among digital natives for the transformation team. Effective team composition involves managing diverse skills for various roles and functionality (Forth *et al.,* 2020).

- **Capital Plan and Budget Constraints**

Senior executives often grapple with tight budgets during the change process (Davenport & Westerman, 2018; Hemerling *et al.,* 2018). This tendency may arise from an incomplete grasp of successful transformation drivers and the misperception that performance improves solely through cost-cutting (Leonard-Barton, 1988; Barney, 1991). Despite acknowledging digital transformation's financial benefits, many organizations need to plan and allocate

funds, resulting in over forty percent of projects falling short (BCG, 2020). Economically, successful digital transformation involves a ***"short-term pain, long-term gain"*** approach, aligning budgets with strategic plans (Matt *et al.,* 2015).

Financial controllers often label digital transformation funding as expenses, limiting resources, and decision-making (Hansen & Sia, 2015; Ustundag & Cevikcan, 2017, pp. 173-176). Addressing budgets requires a mindset shift, viewing digital transformation as an investment, not an expense. Leaders must grasp financial implications, align budgets with long-term goals (Hemerling *et al.,* 2018), and consider tech adoption, talent development, process optimization, and change management (Matt *et al.,* 2015; Stone, 2018). A strategic budget approach enables organizations to overcome constraints (Westerman & Bonnet *et al.,* 2015). Informed resource allocation and effective financial management help navigate digital transformation's complexities.

- **Agile Governance and Monitoring Framework for Continuous Evolution**

Digital transformation failures often stem from inadequate monitoring and a lack of process-driven approaches (Yoo, 2010). Success depends on an agile mindset and strong corporate governance, reinforced through leadership by example (Smith & Tushman, 2005; Kane *et al.,* 2015). Leaders must embed agility across all levels to foster a transformative culture (Solis & Szymanski, 2017; Forth *et al.,* 2020). Kotter (2012) warned against complacency in establishing urgency. While execution teams grasp agility’s value, weak governance hinders operations (Issa *et al.,* 2018; Shaughnessy, 2018). Effective governance and policies are crucial (Westerman, 2016). BCG (2020) found organizations prioritizing these aspects to achieve 90% success, with over half setting KPIs for monitoring. Aligning transformation teams with organizational culture and executive vision enhances transparency and accountability, ensuring strategic progress (Forth *et al.,* 2020).

- **Core Competence and Capabilities for ODT**

Various research studies and surveys have highlighted that core competencies and capabilities remain critical challenges in digital transformation (Ebben & Johnson, 2005; BCG, 2020). Capgemini reports that 77% of organizations lack the necessary skills and knowledge, often relying on vendors or external experts (Westerman *et al.,* 2011). This shortage of IT professionals increases dependence on specialists within transformation teams (Westerman *et al.,* 2014, 2015). To address this, large companies frequently replace outdated technologies rather than invest in long-term human resource development (Ebben & Johnson, 2005; Cray, 2015; Bloomberg, 2018). However, digital transformation success depends on technology and skilled IT professionals capable of effectively integrating and managing these systems (Cray, 2015; Bloomberg, 2018; Baker McKenzie, 2021).

Talent acquisition may often be limited to human resources departments and may hinder effectiveness (Cray, 2015). Outsourcing talent acquisition provides a rapid solution to bridge skill gaps, complementing organic talent growth (Bloomberg, 2018). Organizations must synthesize and integrate insights from various studies (Table 3) to enhance capabilities and improve transformation outcomes.

ODT Challenges	Literature and Journals
Leadership commitment from executives to middle management and digital culture mindset	Hannan & Freeman (1984); Weick & Quinn (1999); Burnes (1996, 2004); Buchanan *et al.* (2005); Smith & Tushman (2005); Birkinshaw et al. (2008); Yoo (2010); Kotter (2012); Fitzgerald *et al.* (2014); Catlin et al. (2015); Matt *et al.* (2015); Solis & Li (2018); Forth et al. (2020)
Deploying Talent and High-Caliber expertises	DeLone & McLean (1992); Stone (2018); Fitzgerald *et al.* (2004); Bryson & Anderson (2000); Bharadwaj *et al.,* (2013); Forth *et al.* (2020); Frankiewicz & Chamorro-Premuzic (2020)
Capital plan and budget constraints	Hannan & Freeman (1984); Leonard-Barton (1988); Barney (1991); Matt *et al.* (2015); Westerman & Bonnet (2014, 2015); Ustundag & Cevikcan (2017); Hemerling *et al.* (2018); Stone (2018)
Agile Governance and monitoring framework for continuous evolution	Smith & Tushman (2005); Yoo (2010); Westerman *et al.* (2011); Kotte (2012); Kane *et al.* (2015); Solis & Szymanski (2017); Frankiewicz & Chamorro-Premuzic (2020); Forth *et al.* (2020);
Core competence and Capabilities for ODT	Allen (1984); Westerman *et al.* (2011); Bharadwaj *et al.* (2013); Fitzgerald *et al.* (2014); Cray (2015); Matt *et al.* (2015); Solis & Li (2018); Baker McKenzie (2021)

Table 3: The Empirical Literatures of the ODT Challenges – by researcher

2.1.3 ODT Barriers

Fitzgerald *et al.* (2014) highlighted that the interaction between digital layers and physical demands in modern business contributes to digital transformation failure. Despite seeking innovative strategies, obstacles hinder transformation success. Overcoming these barriers is crucial for organizations to achieve digital transformation gains (Westerman, 2011, 2014; Buvat *et al.,* 2017). Extensive research identified barriers categorized by complexity and importance, posing future challenges.

Van Wijk *et al.* (2008) delineated that these investigations illuminate diverse obstacles across three impact tiers: ***intra-level, inter-level, and meta-level*** within organizations. Intra-level barriers arise within distinct business processes and units. Inter-level barriers encompass external interactions with competitors, business partners, and supply chain stakeholders. Meta-level barriers involve higher-level entities like government and regulatory bodies and the global climate. Grasping the dynamics and challenges of these interaction levels is crucial for identifying and addressing specific impediments thwarting digital transformation initiatives in organizations (Van Wijk *et al.,* 2008; Bonnet *et al.,* 2015). Recognizing and proactively confronting these barriers empowers organizations to devise effective strategies for maneuvering challenges and elevates the potential of fruitful digital transformation (Bharadwaj *et al.,* 2013; Frankiewicz & Chamorro-Premuzic, 2020).

Digital transformation drives business growth but requires substantial financial investment, often constrained by budget limitations (Westerman *et al.,* 2011; Correani *et al.,* 2020). Internal constraints hinder R&D and innovation, while external constraints, including limited government support and venture capital, create financial uncertainty (Smith & Tushman, 2005; Catlin *et al.,* 2015). Organizations struggle to adapt to rapid digital advancements, relying on outdated methods and legacy systems (Vogelsang *et al.,* 2019; Yoo, 2020). A lack of clear digital vision further impedes transformation, often driven by market pressure rather than strategic commitment (Westerman, 2014). Success requires a well-defined vision, cultural adaptation, and strong leadership (Ustundag & Cevikcan, 2017; Morakanyane *et al.,* 2020). Beyond technology, transformation demands organizational support and cultural change (Loebbecke & Picot, 2015; Vial, 2021). Developing an internal digital culture, fostering collaboration, and aligning leadership with a clear vision are essential for sustainable transformation (Matt *et al.,* 2015; Berghaus, 2016).

Inadequate change management impedes digital innovation due to knowledge gaps and talent shortages (Matt *et al.,* 2015). The competitive market makes acquiring skilled digital

talent challenging, with IT maintenance staff often lacking the required expertise (Schumacher *et al.,* 2016; Ustundag & Cevikcan, 2017; Yoo, 2020). Mindsets, technological proficiency, and human barriers further obstruct transformation efforts (Schwertner, 2017). Talent scarcity affects both organizational performance (intra-level) and market competitiveness (meta-level) (BCG, 2020). Successful digital transformation requires seamless integration of technology, strategy, competencies, and workforce capabilities (Kane *et al.,* 2011). Leadership dissatisfaction significantly hampers innovation, emphasizing the need for active leadership engagement and a culture of continuous learning and adaptation (KPMG Global Survey, 2021; Forth *et al.,* 2020).

External factors, including economic conditions and regulatory constraints, further slow transformation, complicating the execution of strategic initiatives (Parviainen *et al.,* 2017; Forth *et al.,* 2020). Established competitors with complete transformations intensify the challenge of achieving competitive relevance through digital technologies (Delone & McLean, 2003). Organizations must recognize these barriers and implement adaptive strategies to navigate the evolving digital landscape effectively.

Further compounding the complexity, digital transformation initiatives encounter potential disruptions due to fluctuations in market demands, potentially imperiling their successful execution. Regulatory barriers, such as policies and standardization, constrain transformation endeavors, while innovative incentives can potentially expedite progress (Delone & McLean, 2003; Catlin *et al.,* 2017). Organizations often need to be made aware of the need for change in the business environment until it is too late, further exacerbating the challenges of digital transformation (Ustundag & Cevikcan, 2017; Matt *et al.,* 2017; Yoo, 2020). The researcher summarizes empirical research across various domains (*Table 4*).

Categories	Description	Associated Articles and References
Financial	High Investment Budget over-run ROI	DeLone & McLean (1992); Westerman *et al. (*2011); Vogelsang *et al.* (2019) Catlin et al. (2020); Correani *et al.* (2020); Frankiewicz & Chamorro-Premuzic (2020)
Technology	Digital Infrastructure Technological Disruption Legacy System	Smith & Tushman (2005); Westerman & Bonnet (2015); Vogelsang *et al.* (2019); Morakanyane *et al.* (2020); Yoo (2020)
Organization Vision	Digital Vision & Strategy System Design Digital Talents	Holland & Light (1999); Teo & Choo (2001); Westerman *et al.* (2012, 2014); Westerman (2014); Matt *et al.* (2015); Loebbecke & Picot (2015); Berghaus (2016); Ustundag & Cevikcan (2017)
Change Management capability	Implementational Skills Strategic Alignment and Integration Human Factors	Kane *et al.* (2011); Westerman *et al.* (2011); Fitzgerald *et al.* (2014); Matt *et al.* (2015); Schumacher *et al.* (2016); Schwertner (2017); Yoo (2020)
Leadership	Managerial Behavioral Leadership Competence Management Supportive	Kane *et al.* (2011); Westerman *et al.* (2011, 2014); Hansoen & Sia (2015); Ustundag & Cevikcan (2017); Zimmermann *et al.* (2018); Bryson & Anderson (2000); Forth *et al.* (2020)
Regulatory and Environment	Economy Climate Government Policy Industrial Standardization	Delone & Mclean (2003); Van Wijk *et al.* (2008); Parviainen *et al.* (2017);Catlin *et al.* (2017); Zimmermann *et al.* (2018); Forth *et al.* (2020); Yoo (2020)

Table 4: The Empirical Literatures of ODT Barriers - Source: By Researcher

2.1.4 What is Meant by Successful ODT

> *"A successful digital transformation is a substantial effort that reshapes culture, enhances business practices, fosters innovation, facilitates efficient collaboration, and drives greater value with reduced effort,"*

DeLone & McLean (2003) advocated for this transformative concept. While many studies explore digital transformation's success indicators and outcomes, they often focus on specific facets, leaving a comprehensive understanding of success to be explored. Some studies pinpoint success indicators like employee productivity, financial growth, improved customer experiences, and expanded market share (Fitzgerald *et al.,* 2014; Kontic & Vidicki, 2018; Forth *et al.,* 2020). The literature on successful digital transformation spans disciplines, drawing from diverse theories to explore concepts like digital innovation, solutions, applications, and business strategies, all contributing to organizational objectives (Berman,

2012; Solis, 2018; Zimmermann et al., 2018, pp. 116-118). Nevertheless, Westerman and McAfee (2014) contended that digital transformation's link to innovation should be seen as an innovation process fueled by digital innovation, leveraging technology for improvement. Achieving digital transformation success hinges on the internal realization of strategy, employees, competencies, and culture (Markus, 2004; Smith & Tushman, 2005; Gurbaxani & Dunkle, 2019). Digital innovation's maturity derives from transformed value creation, reflecting an organization's digital offerings (Poon & Wagner, 2001; Majchrzak *et al.,* 2016; Parviainen *et al.,* 2017). Literature needs more clarity due to digital transformation's multifaceted, complex nature. It is an ongoing, open-ended process, and while scholars explore macro and micro-level success, measuring tangible and intangible aspects, consensus still needs to be discovered. This lack of agreement necessitates a more precise understanding and measurement approach for digital transformation's success (DeLone & McLean, 1992; Bharadwaj *et al.,* 2013).

Overall Organizational Performance reflects digital transformation's financial and non-financial outcomes, including sales growth, customer base expansion, and brand reputation (Ustundag & Cevikcan, 2017; Berghaus & Back, 2016). Quantitative measures such as stock market value and earnings assess financial impact, while customer satisfaction and public perception highlight broader success (Kontic & Vidicki, 2018). DT enhances performance by integrating technology into operations and, in some cases, replacing traditional models when digital business surpasses core business (Parviainen *et al.,* 2017). Revenue from digital business depends on digital market offerings, with external transformation—market demands, partnerships, and supply chains—being critical for success (Zhu *et al.,* 2006; Yoo, 2010). Failure to generate external outputs leads to poor outcomes, making External Transformation essential in evaluating an organization’s ability to adapt its business model (Parviainen *et al.,* 2017; Solis, 2018). Key measures include innovation count, digital product/service growth, and customer interaction, with satisfaction

indices assessing digitalized customer experiences (Berghaus & Back, 2016; Kontic & Vidicki, 2018). The third and final dimension of ODT is Internal Transformation, addressing internal changes during the process. It uses maturity models and measures success across dimensions (Markus, 2004; Smith & Tushman, 2005). The transformational strategy reflects maturity, vision transparency, and planning (Parviainen *et al.,* 2017). Organizational structure and governance measure the agility of implementation, self-learning teams, and management support the process maturity reflects efficiency, often cost and time (Majchrzak *et al.,* 2016; Ustundag & Cevikcan, 2017). *Table 5* summarizes these dimensions and measurements for a holistic evaluation.

Success Dimension	Factors	Measurement Approaches	Associated Articles and References
Overall Organization Performance	Organization Value	Market Share, Market-to-book data	Delone & McLean (2003); Markus (2004); Zhu *et al.* (2006); Fitzgerald *et al.* (2014); Westerman (2012, 2016); Berghaus & Back (2016); Majchrzak *et al.* (2016); Parviainen *et al.* (2017); Ustundag & Cevikcan (2017); Bloomberg (2018); Forth *et al.* (2020)
	Sales Volume and Customer Base	Business Turnover, market share growth, Customers base	
	Efficiency and Profitability	Operating margin, return on Assets, Earning per Share, Cost Saving	
	Customer Satisfaction and Brand reputation	Index Score, CSI, KPIs, Customer Engagement in Digital Touchpoints	
	Revenue and Profitability from Digital Business	Revenues for Digital Business, Sales Volume and Profitability	
	Relative Important of Digital Business	Digital business contribute to the overall business, Share of Digital Revenue	
Transformation Processes Realization	ODT Strategy	Acceptance and Maturity Level, transparency of Process, digital Vision, Strategy and Objectives	Armenakis *et al.* (1993); Holland & Light (1999); Delone & McLean (2003); Markus (2004); Smith & Tushman (2005); Zhu *et al.* (2006); Gong *et al.* (2013); Matt *et al.* (2015); Majchrzak *et al.* (2016); Westerman (2012, 2016); Parviainen *et al.* (2017); Ustundag & Cevikcan (2017); Solis (2018); Bloomberg (2018); Yoo (2020)
	Organizational Structure and Governance	Team Collaboration & Set-up, Maturity of Organization & IT Structure, team Agility & Management Support	
	Process Implementation	Maturity of Processes, effectiveness & Efficiency, Processing innovation	
	Digital Culture and Leadership	Maturity of Digital Culture & Mindset, Leadership Qualification & Style, Digital Affinity	
	Digital Products & service Innovation	Number of Projects, Products & Services Innovation, Maturity of Quality & Continuity of Digital Development	
	New Digital Business Model	Maturity of New business model and Contingency Plan	

Table 5: The Empirical Literatures of dimensions of successful ODT – By Researcher

Digital culture and leadership are pivotal in assessing innovation mindset and leadership style (Westerman *et al.,* 2012; Parviainen *et al.,* 2017). Knowledge and competencies gauge knowledge management and digital skills (Delone & McLean, 2003; Smith & Tushman, 2005). These domains are vital success factors in digital transformation (Matt *et al.,* 2015; Majchrzak *et al.,* 2016). Successful digital transformation is intricate, spanning diverse dimensions: two key aspects, Organizational Performance and External Transformation, gauge outcomes and external influence (*Figure 7*). The Internal Transformation dimension probes internal shifts during the process, which the systematic review identifies twelve measurements to concretize success across these areas, fostering a comprehensive grasp of digital transformation's achievement (Markus, 2004; Parviainen *et al.,* 2017). The identified dimensions and factors stem from an in-depth analysis of DT literature, aiming to comprehend ODT success, align practical measurements, and bolster this study. In summary, ODT's success is integrating both dimensions. Throughout history, organization-wide triumph signifies effective DT, while transformational processes directly contribute to goals through multidimensional commitment (Delone & Mclean, 2003).

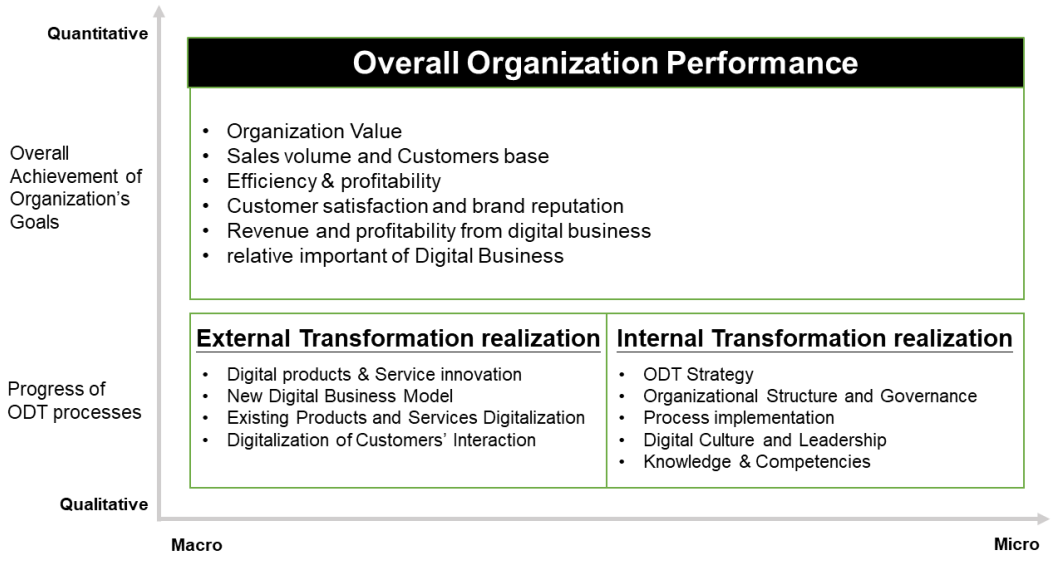

Figure 7: Overall Organization Performance with External & Internal Transformation realization - By Researcher

2.1.5 Framing ODT study with the 3H Framework

Digital transformation extends beyond isolated IT projects (Leonard-Barton, 1988; Kane *et al.,* 2015), emphasizing meaning-making for organizational change (Cornelissen & Werner, 2014). Amid the digital era, navigating this complexity involves organizational traits, affordance, context, tactics, and technology's implications (Yoo *et al.*, 2010). Effective digital transformation management necessitates multidimensional adaptation (Wessel *et al.,* 2021) and advances cognitive development and change literature (Orlikowski & Gash, 1994; Zimmermann *et al.,* 2018). While digitalization, leadership, culture, and more are crucial, scholars stress technology-driven business model change, strategic decisions, and multidimensional skills across the organization (Markus, 2004; Smith & Tushman, 2005; Schwertner, 2017). Understanding this holistic approach empowers organizations to embrace the meaningful transformation encompassing technology, strategy, and people for sustained success in the digital landscape.

The survey of McKinsey & Company emphasizes technology-managed processes for improved performance; it sustains competitive advantage by encompassing culture, strategies, management, competence, and technology. Recognizing the role of meaning-making in guiding transformation is growing, and navigating complexities involves digital culture, context, practices, and affordances (Yoo *et al.,* 2010; Cornelissen & Werner, 2014; Bloomberg, 2018). Integrating insights from management, leadership, sociology, and psychology enriches organizations' understanding of digital transformation. This study explores digital transformation's link to organizational change, leadership, management, and sociocultural influences. Adopt Yu's 3H holistic framework offers a structured approach. This roadmap addresses challenges and opportunities and considers Heart (leadership), Head (strategy), and Hand (implementation), which aid organizations in navigating complexities and attaining successful outcomes.

2.2 The Heart Elements (Leadership and Organizational Culture)

2.2.1 Digital Leadership today

Digital leadership is vital for successful transformation, blending tech expertise with deep organizational insight (Hannan & Baron, 2002; Bloomberg, 2018; Buil & Matute, 2019). Influential digital leaders embody creative thinking and tech proficiency to elevate digital business value (Birkinshaw & Goddard, 2009). They ensure optimal process outcomes for all stakeholders (Berman & Marshall, 2014; Catlin *et al.,* 2015). This leadership's significance spans various research levels, from national to individual (Cortellazzo *et al.,* 2019). Digital leadership encompasses tasks like goal setting, tech support, efficient process design, commitment fostering, resource adaptation, informed decisions, value addition, and shared goal achievement (Hannan & Baron, 2002; Bloomberg, 2018; Buil & Matute, 2019; Kretschmer & Khashabi, 2020). Allio (2005) claimed that addressing social practices like managing conflicts, forging workforce relations, navigating politics, and leveraging diverse traits. This leadership theme guides and embodies organizational structure, influence, innovation, and transformation facilitation (Smith & Tushman, 2005). Solis (2018) agreeed and emphasized its constructs, strategies, relationships, and processes for inspiring digital transformation. Literature highlights digital leadership's significance in organizations, spanning levels and addressing complex social dynamics for a transformative environment.

- **The distinctive digital leadership**

In recent decades, technology's role in organizations has surged, permeating all functions, and demanding tech-savvy digital leaders with a firm business grasp (Smith & Tushman, 2005; Solis, 2018; Kretschmer & Khashabi, 2020). Effective digital leadership means integrating technology seamlessly across levels, fostering collaborations, and considering operational boundaries (Stone, 2018; Ustundag & Cevikcan, 2017). Nevertheless, some digital leaders need help transitioning business strategies due to proficiency gaps in organizational infrastructure and change management (Bryson & Anderson, 2000;

Westerman *et al.,* 2011). Technology's role has surged and permeating all functions, demanding tech-savvy digital leaders with a firm business grasp (Solis, 2018; Kretschmer & Khashabi, 2020). Effective digital leadership means integrating technology across levels, fostering collaborations, and considering operational boundaries (Nambisan *et al.,* 2017; Stone, 2018). Nevertheless, some digital leaders need help transitioning business strategies due to proficiency gaps in organizational infrastructure and change management (Westerman *et al.,* 2011; Cascio & Montealegre, 2016).

- **Digital Leadership versus Traditional**

Digital technologies reshape businesses and cultures, impacting roles and competition; transformations span tech, roles, culture, and competencies for goals (Teo & Choo, 2001; Casadesus-Masanell & Ricart, 2010; Bharadwaj *et al.,* 2013). The World Economic Forum (2016) reported that 82% of firms seek strong digital leadership amid transformation, yet only 11% possess it. Agile structures involving execs, management, and digital teams, replace hierarchies (Bass, 1997; Bennis, 2013). In the rapid digital era, digital leadership aligns functions, culture, and environment (Berman, 2012; Nambisan *et al.,* 2017).

Recognizing digital leadership's importance, organizations must nurture it, shifting from authority-based to collaborative leadership is crucial, and digital leaders demand diverse soft skills for effective team leadership in evolving digital environments, fostering trust and open communication (Westerman *et al.,* 2012; Vogelsang *et al.,* 2018). They differ from traditional leaders, possessing digital vision, tech knowledge, and agility (Kane *et al.,* 2015). Serving as social influencers, they embrace uncertainty and encourage learning (Kane *et al.,* 2015), and transitioning demands process management, diverse perspectives, and change drive (Westerman, 2016). Digital leadership transcends norms, adapting to lead transformations effectively (Cascio & Montealegre, 2016).

2.2.2 Transformational and Transactional Leadership in Digital Era

Successful organizational transformation relies on strategic decisions and effective leadership (Child, 1972; Deci *et al.,* 1999). Leadership parallels a dragon boat's drummer, guiding the team (Yu, 2020). Management styles vary, common ones being transformational or transactional, and leadership traits inspire behaviour to achieve goals (Bass, 1997; Bolden & Gosling, 2006; Westerman *et al.,* 2014). Organizational transformation changes subordinates' style, culture, and behaviour through 'Transformational Leadership' (Avolio *et al.,* 1991; Bass *et al.,* 2003; Birasnav, 2014).

During DT, leaderships face exciting and challenging aspects, navigating unexpected barriers. To counter potential threats, modern digital leaders should discard old paradigms, embracing new ideas to align with transformational goals (Bass *et al.,* 1999, 2003; Bassett-Jones & Lloyd, 2005). Literature has explored leadership traits linked to personality and situational intelligence and adaptive context-based practices have been emphasized, including task-driven and knowledge-based leadership models (Lowe *et al.*, 1996; Javidan, 1998; Kanungo, 2001; Moss & Ritossa, 2007). Emotional intelligence models focus on emotions, motivation, self-awareness, and social skills (Shamir *et al.,* 1993; Zakay *et al.,* 1998; Cavazotte & Hickmann, 2012). Given the tech and change management fusion, studies highlight the leadership models in this complex environment during ODT, including transformational and transactional styles (DeLone & McLean, 2003; Birkinshaw *et al.,* 2008; Gurbaxani & Dunkle, 2019).

Burns (1978) introduced transformational leadership; Bass & Avolio (1985) extended the theory of transactional and transformational leadership coexist, motivating through rewards and inspiration (Lowe *et al.,* 1996). ODT involves multidimensional leadership, driving strategies to meet objectives (Bassett-Jones & Lloyd, 2005; Rowold, 2005; Walumbwa, 2008). Transformational leadership is contextual, inspiring with clear communication, positive vision, and growth opportunities, exceeding expectations (Bass, 1999; Piccolo & Colquitt, 2006). The author concurs with Bass (1985), extending Burns' model, identifying

four key components: Idealized influence, Inspirational motivation, Intellectual stimulation, and Individual consideration, applied to digital transformation. Leaders manage change, acting as charismatic role models, building commitment and self-efficacy (Podsakoff *et al.,* 1990, 2003; Bass & Riggio, 2006, pp. 105-138; Piccolo & Colquitt, 2006). In this complex evolution, leaders' behavior influences ethical decisions (Walumbwa *et al.,* 2008; Weterman, 2016; Zimmermann *et al.,* 2018). Leaders share the organizational vision amid unexpected change, with inspiring influence as a crucial dimension (Schwarzmüller *et al.,* 2018). However, generation gaps and conflicts can arise between tech-savvy younger individuals and experienced elders, leading to skepticism and resistance to change (Purvanova *et al.,* 2009; Zimmermann *et al.,* 2018). Transformational e-leadership inspires and motivates followers to focus on processes over decision-making.

ODT progress mirrors a battle, with missions focused on specific objectives and targets, often under tight constraints. This leadership style prioritizes employee supervision over development and change (Manz & Sims, 1987; Avolio *et al.,* 2000). Transactional digital leadership emphasizes current operational efficiency rather than future innovation, maintaining established processes and progress (Bono & Judge, 2004). Unlike coaching or democratic styles, it leans towards a directive approach, offering stability, and typically seen in established companies and structured projects, it thrives in hierarchical settings (Lowe *et al.,* 1996; Bolden *et al.,* 2003, pp. 78-91). Jung *et al.* (2008) echoed that during DT, it is vital to manage unexpected incidents transparently and confidently (Avolio *et al.,* 2000; Bono & Judge, 2004). Transactional leaders excel in directed, reward-driven environments, overseeing performance and adhering to set time and quality parameters (MacKenzie *et al.,* 2001; Horváth & Szabó, 2019). While subordinates might not favour their demanding style, senior management may have different views. Morakanyane *et al.* (2017) proposed that transactional leadership excels in structured environments, effectively managing projects with repetitive tasks and short-term goals.

Market pressure and technological evolution introduce volatility and complexity into transformation processes, akin to situations in military or police departments where resolute leaders respond adeptly during crises (Horváth & Szabó, 2019; Veina & Titko, 2019; Kretschmer & Khashabi, 2020). Financial rewards significantly motivate IT workers (Leonard-Barton, 1988; Avolio *et al.,* 1999, 2000; Matt *et al.,* 2015), as Neubauer *et al.* (2017) found that over 63% of them to be reward-driven. E-leaders must enhance social and networking skills to foster business collaboration (Jung *et al.,* 2003; Avolio *et al.,* 2014). The *'Virtual e-Leader,'* adept at distant management, is essential as technology facilitates cross-boundary virtual teams (Hambley *et al.,* 2007; Gupta & Pathak, 2018). Such teams are prevalent in multinational organizations (Burke *et al.,* 2006). Multicultural leadership is critical, necessitating geopolitical understanding and building trust amid geographical dispersion (Bartol & Liu, 2002). Clear, direct communication through a formal hierarchical system expedites the transformation process for virtual digital leaders (Hambley *et al.,* 2007).

During the intricate process of ODT, a balanced leadership approach emerges as the most effective, combining the strengths of both transformational and transactional methods (Bono & Judge, 2004; Buil *et al.,* 2019). Bass (1997) emphasizes how transformational leadership fuels innovation and practical problem-solving, a crucial asset for organization. Notably, digital leaders must deftly navigate the complexities of paradoxical situations (Purvanova *et al.,* 2009; Avolio *et al.,* 2014). A compelling synergy between leadership and technology emerges in a reciprocal cycle that shapes organizational culture, structure, and individual behaviour (Cortellazzo *et al.,* 2019; Avolio *et al.,* 2000). Moreover, the motivational style wielded by leaders significantly impacts the assimilation of employees into the organizational fabric. Within established frameworks, transactional leadership shines as an operational linchpin, facilitating efficient processes and seamless transformation (Westerman *et al.,* 2011; Parviainen *et al.,* 2017).

2.2.3 Lao Tzu – Taoism in Business Transformation

“A leader is best when people barely know he exists, when his work is done, his aim fulfilled, they will say: we did it ourselves – (太上，不知有之；其次，親而譽之；其次，畏之；其次，侮之。信不足焉，有不信焉。悠兮，其貴言。功成事遂，百姓皆謂“我自然”). – ***Lao Tzu (Laozi)***

The ancient Chinese philosopher Lao Tzu, from the 6th Century BC, introduced the Taoist leadership theory through his renowned work, *Dao De Ching*. This philosophy centres on Dao, representing the interconnectedness of humans, nature, society, and life. In contrast, Confucians emphasize *'De'* which symbolizes self-realization without external influence. Lao's Taoism reflects an atheistic perspective, emphasizing the innate human nature methodology. Lao Tzu's teachings underscore the significance of reason and dialectical factors in driving change, advocating agility, and flexibility in influencing organizations. Many transformations face challenges, such as unmet objectives or delayed progress. Lao identifies human factors as pivotal for failure and success, making leadership a revered totem in business (Ashton & Lee, 2008). While leadership is often discussed within psychological contexts, Taoism's human-centric paradigm aligns with the overall tenets of Lao's philosophy (Creel, 1956; Lee *et al.,* 2008, 2013; Xing & Sims, 2012). Lao's concept of *'Dao'* parallels an organization's structure, regulations, resources, and culture, akin to the universe's fundamental principles. *'Yin and Yang'* (陰陽) symbolize contradictory interactions and laws' eternal nature, as per Taoism. Lao likens transformation to 'water,' formless and adaptable (Lee *et al.,* 2013). Effective, influential leaders, like rivers and seas, lead and accommodate numerous streams, embodying water's versatility, and strength. Altruism, akin to water's nature, shapes leaders who are both gentle and powerful, adapting to diverse situations. In a broadcast interview, the acclaimed martial arts instructor, actor, film director, and philosopher Bruce Lee expressed his enthusiasm for the water theory and phrase:

> *“Empty your mind, be formless, shapeless – like water. Now you put water into a cup, it becomes the cup, you put water into a bottle, it becomes the bottle, you put it in a teapot, it becomes the teapot. Now water can flow, or it can crash. Be water, my friend.”* ***Bruce Lee***

Bruce Lee asserted that human behaviour should not solely rely on instinct but should harmonize control and spontaneity. He believed that success emerges from a balanced blend of the natural and cultivated aspects of oneself. According to Lee, personal style is a product of continuous growth, crystallizing over time. Lee *et al.* (2013) synthesized research indicating five critical traits of ***'wateristic'*** personality leadership: *altruism and helpfulness, humility and modesty, flexibility and adaptability, transparency and honesty, and persistence and perseverance.* In Taoism, leadership's essence lies more in interpersonal dynamics than authoritative power (Van Knippenberg, 2005; Lee *et al.,* 2008).

Laozi endorsed a set of values that are present in chapter eight of *'Dao De Ching'*: 「上善若水。 水善利萬物而不爭，處衆人之所惡， 故幾於道。 居善地，心善淵，與善仁，言善信，政善治，事善能，動善時。夫唯不爭，故無尤。」The dwelling of goodness leadership involves a heart in motion, displaying benevolence, upholding faith, demonstrating skill, and valuing time management (Lee *et al.,* 2003, 2013). Effective societal leadership requires humility, avoiding arrogance, and embracing self-sacrifice. Modesty is vital for understanding and influencing others. For organizational governance, Lao emphasized leaders' delicate empowerment and avoidance of restlessness, discouraging boastful behaviour (Van Knippenberg, 2005; Purvanova *et al.,* 2009; Lee *et al.,* 2008, 2013).

Leaders must adapt their styles to address unexpected barriers in the dynamic digital transformation landscape, ensuring continuous operations. However, concerns about personal relationships disrupting ethical considerations trouble organizational owners (Bono & Judge, 2004; Ashton & Lee, 2008). The core tenet of Daoist leadership, '*Wu Wei* - 無為**'**, suggests the concept of '*Upward with downstream collaboration* – 上無為而下有為,' which a balanced approach of non-artificial action, aligning with the natural flow (Chan, 1998; Lee, 2003; Xing & Sims, 2012). Laozi advocated allowing spontaneous transformation, nourishing progress through non-offensive, non-manipulative actions (Jung *et al.,* 2003; Lee *et al.,* 2008; Xing & Sims, 2012). Taoism emphasizes inner self-awareness, shaping event

situations through experiences and attitudes (Lee *et al.,* 2009, 2013). Leadership should prioritize progress over immediate results and focus on future impact, not current performance, reflecting the Taoist notion that '重是輕的根基，靜是躁的主 – *the heavy is the root of the light; the still is the lord of the restless*' (Loazi, 1961, pp. 68-72). Wu Wei embodies collective responsibility over personal heroism, facing failure with resilience and leading wisely with psychological well-being (van Knippenberg, 2005; Lee *et al.,* 2008, 2013; Xing & Sims, 2012).

' Wu Wei, ' is central to Taoism, advocating natural, unforced actions. In digital transformation, this aligns with agility, adapting to tech advancements. Taoist-based methods encourage fluid change, humility, and self-reflection, echoing successful digital shifts. Collaborative leadership promotes innovation and trust, empowering teams collectively that resonate with holistic digital transformation and technology and fostering cross-functional collaboration (Lee *et al.,* 2008, 2013). As a Taoism contribution, traits like tolerance, submissiveness, and self-reflection align with *Wu Wei*. Inner growth combined with tech can enable wise leadership in transformation. Clear structure and culture are vital for all units, ensuring alignment with objectives (Hambrick & Mason, 1984; Deci & Ryan, 2000; Purvanova *et al.,* 2009).

2.2.4 The Role of Organizational Culture and Behavior

Organizational culture is pivotal, aligning values and objectives (Child, 1992; Cummings, 2004). Like a theatrical performance, it embodies organizational essence (Lacatus, 2013; Thanomwan & Buncha, 2014). Nike's CEO, Mike Parker, highlighted strong culture's importance, urging self-critique and avoiding complacency. Nike's culture fosters value creation through clear instructions, rules, and VMV – Vision, Mission, Values (Donahoe, 2020). Crafting culture takes time but is crucial for success (Child, 1972; Mathieu & Taylor, 2007). Digital transformation integrates tech across sectors (Bharadwaj *et al.,* 2013; Legner

et al., 2017), necessitating a culture shift and embracing new tech and ideas (Bharadwaj *et al.,* 2013). While not replacing the culture, transformation adapts it to a digital mindset and capabilities, and strong e-culture motivates teams (Bharadwaj *et al.,* 2013; Lacatus, 2013). Scholars link culture, performance, and digital transformation, exploring their interdependence (Globalization practices).

Organizational culture is pivotal for modern business success, impacting financial performance and effectiveness. A Boston Consulting Group (BCG) study by Hemerling *et al*. (2018) revealed that culture-focused companies outperformed others financially. Notably, 79% of culture-emphasizing firms excelled compared to 67% without this focus. Another study on 75 listed companies found that strong culture yielded a total shareholder return (TSR) of 24%, while S&P's average was 12%; weak cultures had a TSR under 10%. These findings emphasized culture's role in financial success (Legner *et al.,* 2017; Hemerling *et al.,* 2018). Digital transformation culture is crucial and involves broader change beyond tech, requiring the adoption of new ideas and resources in a new business landscape. Yet, many need help cultivating e-culture or grasping the digital transformation's essence (Westman *et al.,* 2012). MIT Sloan Management Review explored e-culture, finding that mature organizations embraced five cultural mindsets during transformation (teamwork, risk-taking, leadership, passion, and agility). Only 23% of early-stage firms showed these traits, indicating that different transformation stages yield distinct cultural features (Kiron *et al.,* 2016). Developing or altering a digital culture involves organizational efforts (Janowski, 2015).

Studies reveal a gap between executives and subordinates' views on digital culture, underscoring the need for unified communication (Westman *et al.,* 2012). However, shaping a potent digital culture fostering talent and leaders is challenging. Two key insights emerge from the research: prioritizing data-driven culture for transformation and emphasizing data management and analytics (Janowski, 2015; Horlacher & Hess, 2016). Data-rich

environments enable digital enterprises. A culture of data sharing, transparency, and informed decision-making is pivotal (Bharadwaj *et al.,* 2013; Westerman *et al.,* 2012, 2013). Table 6 illustrates the contrast between traditional and digital organizational cultures.

Traditional Organizational Culture	Digital Organizational Culture (e-Culture)
Hierarchy and Authority with controlling	Flat, Horizonal and Delegation
Focus on Organizational structure	Customer focus and Market Orientation
Change and transform internally	Flexibility and adaptability to the external business environment
Corporate value and Individual behaviour	Innovation, Knowledge and Technologies
Focus on long-term return within the existing industry	Start with small progress and gain short-term win in global strategy
Emphasis on planning	Focus on action
Bureaucracy and Territorially	Transparency and collaboration
Avoid and measuring risks	Embrace and taking risk, build failure tolerance
Happy-go-lucky	Cautionary with agility

Table 6: Traditional organization culture vs Digital organizational culture - By Researcher

Additionally, digital transformation requires cross-functional collaboration and addressing potential conflicts arising from diverse team members' skills and experiences. Organizational e-culture drives creativity and innovation, necessitating adept leadership for co-learning in a supportive environment. E-leaders must manage conflicts, encourage collaboration, and embrace change (Westerman *et al.,* 2013, 2014; Kiron *et al.,* 2016; Legner *et al.,* 2017). Traditional cultures emphasize hierarchy and individual focus, while dynamic digital cultures feature flat structures, collaboration, market orientation, and innovation. Cultivating these traits enhances an organization's ability to thrive in the digital era and navigate transformation (Janowski, 2015; Legner *et al.,* 2017; Goran *et al.,* 2017).

- **Fundamental Principles of Digital Culture**

The bedrock of organizational digital culture comprises three crucial principles, prerequisites

for initiating the digital transformation journey (Birkinshaw *et al.,* 2008):

1. ***Organizational Environment:*** This principle includes all factors within the organizational context that impact its performance (Brynjolfsson & Hitt, 2000; Birkinshaw *et al.,* 2008). Optimizing aspects like organizational design, leadership, resources, technology, vision, values, and talent development is essential to encourage behaviour aligned with corporate strategies (Birkinshaw *et al.,* 2008).

2. ***Digital Transformation Strategy:*** This principle entails a systematic process of reshaping the organization's business models, products, services, and value chain to align with evolving consumer demands (Brynjolfsson & Hitt, 2000). It mandates skillful utilization of emerging technologies and innovations to steer the transformational voyage.

3. ***Team Competency and Capabilities:*** Central to a flourishing digital culture is the dedication and competence of teams and individuals in pursuit of organizational objectives (Vial, 2021) that entails nurturing a workforce armed with essential knowledge, technical expertise, skills, and optimal practices to navigate the evolving digital landscape and attain desired outcomes (Birkinshaw *et al.,* 2008).

These principles form the foundation of a robust digital culture within organizations. Before embarking on digital transformation, ensuring cultural alignment with these principles is vital. This alignment fosters an environment for successful transformation, empowering the workforce to embrace and excel in the journey.

- **Digital Culture toward Organizational Behavioral**

ODT is a transformative shift that intentionally disrupts entire organizational systems (Bonnet *et al.,* 2015; Kiron *et al.,* 2016; Legner *et al.,* 2017). Its success relies on aligning policies, culture, treatment of customers and employees, innovation, and decision-making (Holland & Light, 1999; Smith & Tushman, 2005; Matt *et al.,* 2015). E-culture, essential in

the digital era, involves assumptions to address challenges, guiding the organization toward digital goals (Matt *et al.,* 2015; Westerman *et al.,* 2012, 2015, 2016).

E-culture's specific norms and features are intricate, Hofstede (2011) highlights digital organizational culture has five core norms impacting today's digital climate. Firstly, digital-native organizations embrace risks, unlike traditional cultures. They foster risk tolerance and learning, which are crucial for navigating challenges (Bharadwaj *et al.,* 2013; Kiron *et al.,* 2016; Chakraborty *et al.,* 2020, pp. 78-82). Digital transformation entails unforeseen hurdles, demanding risk-taking and learning culture. Additionally, it involves managing budget constraints, technology shifts, talent shortages, and economic changes. Encouraging risk-taking and incentivizing risk management is pivotal for transformation success (Hofstede, 2011; Chakraborty *et al.,* 2020). Kane *et al.* (2015) contended that risk aversion stifles established organizations' growth (*cf.* Simon, 2014). Nurturing a risk-taking culture instils deliberate actions, swift recovery from failure, and continuous learning (Bharadwaj *et al.,* 2013; Chakraborty *et al.,* 2020, pp. 78-82; Hemerling *et al.,* 2018).

Digital culture promotes decentralized decision-making by emphasizing guiding principles and delegation over hierarchical control (Beer et al., 1990; Burnes & Jackson, 2011). Empowering skilled talent, rather than relying on frequent performance corrections, drives change and enhances adaptability in fast-evolving environments (Cascio & Montealegre, 2016; Buvat et al., 2017). MIT Sloan research found that 81% of digital talent prefer organizations with empowered leadership, while 74% stress the need for internal skill development (Kane et al., 2015). Capgemini’s Digital Transformation Review highlights a digital talent shortage in 59% of organizations, particularly in soft skills like adaptability and customer focus. This shortage is a key failure factor, requiring organizations to nurture internal talent rather than relying solely on external hiring (Vera & Crossan, 2004; Gelfand et al., 2012; Chakraborty et al., 2020). Simon (2014) outlined the Digital Talent Culture framework, encompassing talent inflow, development, and retention strategies to manage

and cultivate a workforce driving ODT effectively. Inflow involves attracting skilled individuals aligned with the digital vision. The development emphasizes enhancing digital competencies through training and upskilling (Vera & Rodriguez-Lopez, 2004; Hofstede, 2011). Retention prioritizes creating a favourable digital work environment, competitive compensation, and recognition culture. Retaining digital talent is vital for long-term transformation and resilience. This framework ensures a dynamic workforce propelling digital innovation and success (Simon, 2014, pp. 121-178).

Traditional hierarchical structures, once effective for complex organizations, now hinder agility in the digital era. Streamlined, project-based approaches enhance collaboration, flexibility, and goal achievement, with senior executives setting high-level standards (Bharadwaj et al., 2013; Hemerling et al., 2018). Agile cultures prioritize action over excessive planning, fostering iterative adaptation and cross-departmental cooperation (Holland & Light, 1999; Fitzgerald et al., 2014). Digital leaders should promote transparency and interactive environments, leveraging crowdsourcing for quality project outcomes (Bharadwaj et al., 2013; Kiron et al., 2015). Strong cultural beliefs drive innovation and employee support for transformation efforts. Ongoing digital storytelling enhances buy-in, mainly through top-down communication of goals, as seen in Apple’s development narratives (Bharadwaj et al., 2013). Cultural barriers often outweigh technical challenges, influencing digital transformation success (Goran et al., 2017). Figure 8 illustrates the Digital Talent Culture framework.

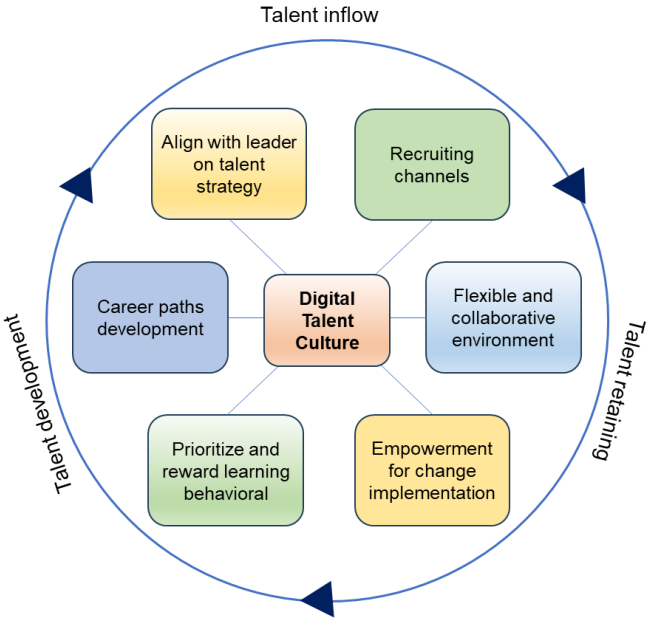

Figure 8: The formulating parameter of Digital Talent Culture - Source: Simon (2014)

2.2.5 Proposed H1 Heart Domain in ODT

Digital technology adoption goes beyond change management, with the potential to disrupt daily operations (Fitzgerald *et al.,* 2014). The *"Great Man Theory,"* coined by Thomas Carlyle (1795-1881), suggests exceptional leaders are born with innate attributes and authority, achieving historical feats against all odds. This view, however, overlooks societal influences on leadership development. Henri Fayol (1841-1925) introduced "*Fayolism*," emphasizing administrative functions, training, education, and experiences as crucial for leadership growth. Like a well-designed body, organizations need nurturing to thrive, with business owners enjoying a healthy organization and a well-crafted business model (Fitzgerald *et al.,* 2014).

The views of leading approach, management guides the organization towards predefined goals. Just as a balanced diet promotes bodily health and knowledge enhances the mind, careful attention prevents mishaps – a principle applicable to organizations. Analogous to the human body's interconnected systems, an organization's framework consists of layers, each crucial to its function. Yu's 3H holistic management framework emphasizes '*Heart*' as an organization's core driving objectives (Yu, 2019). Like the brain and heartbeat in humans,

this domain reconciles norms, culture, and leadership, shaping the organization's identity and uniting its functional components.

Yu (2019) emphasized the absence of standard methods for managing individuals with emotional and rational behaviours, aiming to reshape their outlook in alignment with new business norms. Leaders can positively influence and motivate through heart-centered approaches reminiscent of the nurturing experience. Daoism underscores a 'Heart-oriented – 以心為本' perspective on nature (Purvanova *et al.,* 2009; Čarnogurská, 2012; Lee *et al.,* 2008, 2013; Moon, 2015). Yu (2019, 2020) asserted that the heart domain embodies empathy, motivation, strong interpersonal skills, sincere influence, and attitudinal alignment. During digital transformation, organizations must rally all employees around the corporate culture to propel initiatives and actualize set goals (House & Howell, 1992; Jung *et al.,* 2008; Teague *et al.,* 2013, 2016). Shifting employees' mindsets involves challenging the status quo rather than conventional "bottom-line" thinking (Deci *et al.,* 1999). Fostering a heart-to-heart culture and leadership necessitates addressing obstacles, crafting guiding principles, allocating resources for vision and mission, and establishing core values (Yu, 2019).

Kazuo Inamori – 稲盛和夫 (1932-2022), the founder of Kyocera and KDDI, as well as former chairman of Japan Airlines, highlighted the pivotal role of entrepreneurial personality in the life cycle of business. Inamori emphasized leaders' mentality, rooted in care, sincerity, harmony, and empathy for self and others (Xu & Andersen, 2020). Leaders' ethics and social responsibility are paramount in organizational change (Deci & Ryan, 2000), such as ensuring transparency, data privacy, and fair practices fostering stakeholder trust during the ODT. Leaders prioritize sustainability, integrating digital strategies that minimize environmental impact. Social responsibility involves addressing the digital divide and ensuring all employees access necessary digital tools and training (Kretschmer & Khashabi, 2020). Leaders can prevent biases and promote equality by advocating for ethical AI and inclusive technologies. Ultimately, leaders who emphasize ethics and social responsibility

guide their organizations toward a more equitable, sustainable, and trustworthy digital future, enhancing long-term success and societal impact. Leaders' empathy and emotional intelligence are necessary in navigating organizational change. By understanding and addressing employees' concerns and emotions, empathetic leaders foster a supportive and inclusive environment (Gagne' & Deci, 2005). Emotional intelligence enables leaders to manage their emotions and respond effectively to others, facilitating open communication and conflict resolution. Combined with a positive organizational culture that values transparency, adaptability, and mutual respect, these leadership qualities create a resilient workforce (Li *et al.*, 2021). Cultivating a unified culture under a leader's inspiration, referred to as 'One Heart, One Desire,' is essential for achieving company goals (Schneider *et al.,* 1998; Smith & Tushman, 2005). This synergy ensures smoother transitions, greater acceptance of change, and more prosperous and sustainable organizational outcomes. Yu (2020) concludes that cross-cultural leadership's self-development fosters autonomous motivation and impactful decision-making among subordinates, enhancing business engagement and performance. This evolution represents a game of human chess in socially mature organizations, wherein the conceptual approach to business transformation navigates a technologically revolutionary terrain (Yu, 2020).

During the ODT, management faces complex challenges and must exhibit effective decision-making and problem-solving skills (Bharadwaj *et al.,* 2013; Fitzgerald *et al.,* 2014). Leadership behaviour and attitude mirror the organizational culture, steering performance, and objectives. Yu's 3H management framework underscores human-oriented leadership, cultural coherence, and alignment with strategic planning for value-driven transformation (Deci *et al.,* 1999; Majchrzak *et al.,* 2016). In contrast to digital transformation, various factors contribute to performance benefits and rational approaches. These encompass digital technologies, transformation strategies, financial backing, management focus, organizational culture, human resource expertise, value creation, and project execution

(Teague *et al.,* 2013, 2014, 2016; Westerman *et al*., 2012, 2015; Warner *et al*., 2019).

Organizational behaviour is crucial for nurturing a collaborative culture, utilizing intrinsic and extrinsic rewards for motivation. Effective cross-cultural leadership with people management, talent engagement, and recognition fosters adaptability and development (Schwartz & Bardi, 2001; Westerman *et al.,* 2016). This approach necessitates an organization that continuously improves through cross-boundary learning and process management, embracing knowledge and values at various levels (Huber, 1991; Garvin, 1993; Cummings, 2004). The 3H framework's heart domain proposes that leadership drives performance improvement by focusing on business performance, setting targets, and creating a solid cultural foundation (Schwartz & Bardi, 2001). Traditional business styles need enhancement for successful digital transformation, as organizations are complex systems with diverse agendas beyond performance metrics. A heart-oriented organization acts as a coach, empowering employees at all levels to navigate challenges effectively (Deci, 1971; Child, 1972; Barnet, 1986; Cummings, 2004; Johns, 2006). Yu's 'Heart' domain emphasizes solving issues collectively and aligning organizational norms with business performance and behaviour. Influential people management and reciprocal behaviour drive transformation success, fostering a conducive environment for collaborative goal achievement (Yu, 2020). Senior management also plays a pivotal role in recognizing the importance, necessity, and urgency of change, leading others toward the desired goals (Beer *et al.,* 1990; Hannan *et al.,* 2003; Baker *et al.,* 2007; Al-Haddad & Kotnour, 2015; Appelbaum *et al.,* 2012).

2.3 The Head Elements (Strategy and System) and ODT Relationship

2.3.1 Digital Strategy (DX) and Systems Alignment

Digital transformation strategy alignment, a pivotal focus in organizational change management research and practice, enhances performance (Narayanan *et al.,* 2011; Morakanyane *et al.,* 2017; Solis, 2017, 2018). Amidst today's intricate business landscape,

marked by multidimensional innovation, environmental dynamism, and substantial operational and strategic shifts, achieving alignment grows more intricate. It necessitates comprehensive planning to harness digital technologies for business enhancement. The alignment of digital strategy with the swiftly evolving business milieu and the organization presents challenges (Yeow *et al.,* 2018). Organizations need to devise functional strategies that are mindful of existing infrastructures and transformation objectives (Schwartz & Bardi, 2001; Burgelman & Grove, 2007). As digital technologies reshape business models, organizations must cultivate new competencies amenable to the digital revolution (Banker *et al.,* 2011; Rai *et al.,* 2012). Implementing digital technology also reshapes organizational structures and social relationships (El Sawy, 2003; Susarla *et al.,* 2012).

Sambamurthy *et al.* (2003) emphasize that a successful digital strategy depends on strategic foresight and systemic insight. Strategic foresight, a key aspect of strategic management, enables organizations to leverage resources, identify opportunities, and navigate a rapidly evolving business landscape (Habegger, 2010; Narayanan *et al.,* 2011; Adegbile, 2017). This approach enhances decision-making by anticipating future challenges and uncertainties. ODT requires a deep understanding of technology, competition, and resources. Strategic foresight allows organizations to analyze trends, adapt to advancements, and maintain relevance (Yeow *et al.,* 2018). Beyond analysis, it demands a long-term strategic commitment to foster innovation and sustain competitive advantage.

In line with the resource-based view of strategic planning, strategic foresight must also facilitate group learning behaviour, scenario-based knowledge generation, and the creation of measurable alternative plans. These steps synthesize and conceptualize various digital strategy approaches. Adequate strategic foresight involves phases like broad information analysis, foresight knowledge generation, and action process development (Habegger, 2010). Through this systematic approach, organizations can navigate the complexities of modern business, ensuring the adaptive path to digital transformation (Bharadwaj *et al.,*

2013).

Organizations adopt alternative action plans to establish structured digital information frameworks, facilitating rational decision-making for future strategic actions (Schwartz & Bardi, 2001; Sambamurthy *et al.,* 2003). However, digital transformation often lacks adequate strategic foresight, leading to challenges in addressing unforeseen disruptions and limiting adaptive capabilities (Burgelman & Grove, 2007; Habegger, 2010). Integrating strategic foresight enhances resource optimization, strengthens planning mechanisms, improves decision-making, and fosters organizational development (Adegbile *et al.,* 2017). It enables organizations to identify disruptive innovations, scale transformation processes, anticipate risks, and cultivate a culture of continuous learning and collaboration (Habegger, 2010; Adegbile *et al.,* 2017). To ensure effective execution, organizations must implement a comprehensive digital strategy that delineates transformation boundaries, maps the process trajectory, and establishes external linkages to align with industry dynamics (Bodrožić & Adler, 2018; Yeow *et al.,* 2018). This structured approach facilitates the development of digital infrastructures, ensures operational alignment with external environments, and enhances the scalability and sustainability of transformation initiatives.

In ODT, innovation entails applying new resources, external synergies, and technology to achieve specific goals, while integration aligns existing operations, resources, and technologies (Daniel & Wilson, 2003; Habegger, 2010; Hanelt *et al.,* 2021). Digital transformation combines novelty and business model reform through digital strategy integration, and developing a digital business strategy involves data management, technology selection, and business model transformation (Susarla *et al.,* 2012; Bharadwaj *et al.,* 2013). Technology structuring aligns with digital creation, digital mindset, innovation, Digital capabilities, and value-added growth (Daniel & Wilson, 2003; Berman, 2012; Benner & Waldfogel, 2020; Hanelt *et al.,* 2021).

- Integration is crucial for aligning digital innovation strategies, encompassing existing and new technologies, while coordinating business development, operations, and strategic planning through experimentation analysis (Henfridsson & Yoo, 2014; Morakanyane et al., 2017). Strategic alignment addresses transformation challenges and optimizes resource synergies (Habegger, 2010; Hansen et al., 2011). Effective strategy execution integrates technological capabilities, operational frameworks, digital infrastructure, and collaborative agility (Schuchmann & Seufert, 2015; Benner & Waldfogel, 2020). These elements ensure comprehensive alignment across strategic, operational, and developmental domains, enhancing organizational responsiveness to digital and market changes. The researcher presents the systemic integration matrix for ODT (*Figure 9*):

- **Experimentation and Analysis:** Within the digital systemic matrix, this involves fostering a culture of continuously testing, prototyping, and analyzing outcomes to refine digital strategies. This foundation framework allows organizations to structure experimentation within specific areas and analyzes feedback, using these insights to adapt the matrix elements dynamically and drive innovation.

- **Operational Alignment:** This aspect focuses on integrating digital technologies into day-to-day operations to enhance efficiency, productivity, and process optimization. This matrix helps identify where digital tools can streamline tasks, reduce costs, and enable agile responses to operational challenges.

- **Business Development Alignment:** This element ensures that digital initiatives align with broader business development goals, such as market expansion, customer acquisition, and revenue growth. The matrix highlights potential areas for partnerships, product innovation, and new revenue streams within the digital ecosystem.

- **Digital Strategic Alignment:** This aspect aligns digital efforts with the organization's overarching strategy, ensuring digital investments support long-term goals. In the matrix, strategic alignment helps prioritize digital projects that maximize impact, prevent resource misallocation, and align all digital activities with the company's vision and mission.

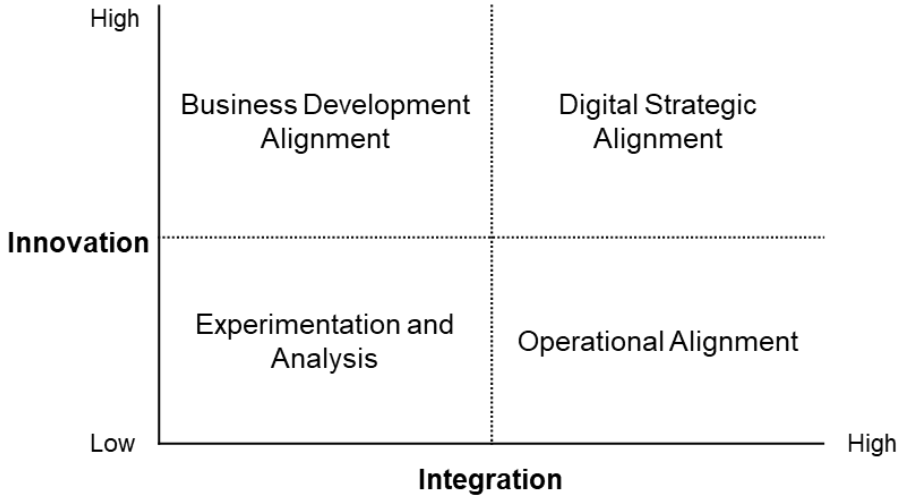

Figure 9: The Digital Systemic Matrix - By Researcher

2.3.2 Resource-Based view toward ODT

Since the 1960s, strategic organizational management has employed SWOT analysis to assess core competency and competitive position based on external opportunities, threats, and internal strengths and weaknesses. Porter (1980) and BCG introduced the BCG Matrix and Porter's 5 Forces to evaluate factors influencing organizational competitiveness. However, in today's rapidly changing environment, external analysis faces criticism due to instability (Bartlett & Ghoshal, 1991; Collis & Montgomery, 1997). Grant (1991a) introduced the Resource-Based Theory (RBT), emphasizing the connection between resources and strategy. Neglecting internal elements can lead to risks (Black & Boal, 1994). Cross-sectional analysis needs a longitudinal approach (McWilliams & Smart, 1993; Porter, 1996, pp.81-84). An organization should focus on competency over external positioning (Hamel & Prahalad, 1994; Collis & Montgomery, 1997). In the competitive business environment, the

business strategy emphasizes core competencies for a sustainable competitive edge (Stalk *et al.,* 1992; Teece, 1992).

Recent strategic management studies acknowledge that an organization's competitive edge relies on internally developed capabilities, resources, and intangible assets (Barney, 1986b). Structural processes and resources shape digital transformation's goals and strategy (Hamel & Prahalad, 1990; Heracleous & Barrett, 2001). Zhang, *et al.,* (2003) and Bharadwaj (2000) echoed the suggestion from Hart (1995) that the three organizational resources' burdens that cannibalize the competitive edge of digital transformation:

- Financial and human resources,
- Knowledge resources of technology and Capabilities knowhow,
- Managerial and leadership resources.

ODT is causally influenced by developing capabilities and competencies gained through experience and internal growth. These capabilities support sustained competitive advantage, allowing organizations to construct a strategic structure to avoid unnecessary competition and pursue growth (Black & Boal, 1994; Healey, 2006). As Peteraf (1993) suggested, unique and irreplicable heterogeneous resources create a competitive edge, with resource creation and development hindering rivals' access. The interplay between "resources" and "technology" further drives ODT, as products depend on resources and vice versa (Prahalad & Hamel, 1990; Hodgkinson, 1997).

Organizations integrate intangible resources and targeted technology during digital transformation to optimize core competencies. Decades of research emphasize the importance of organizational resources in strategic planning (Hamel & Prahalad,1994; Montgomery & Collis,1995; Helfat & Peteraf, 2015). Organizations must link resources, competition, and performance within their business strategies to maintain a competitive advantage, addressing performance gaps (Mowery *et al.,* 1998; Barnett, 2001; Lepak &

Snell, 2002). Core competencies are foundational in ODT frameworks, with their strengthening driving the transformation process (Bharadwaj *et al.,* 2013). The Resource-Based View (RBV) underscores internal resources and competencies as strategic assets, making valuable resources essential for successful digital transformation (Grant, 1991; Leonard-Barton, 1992; Hamel & Prahalad,1994; Barney, 1995).

RBV scholars view disruptive technical resources as leading sustainable advantages in organizational digital transformation (ODT) (Bharadwaj, 2000; Barney, 2001). This approach emphasizes developing IT-related functional capabilities, infrastructure, human resources, and IT-enabled competencies (Barney, 1986c, 1991; Grant, 1991; Casadesus-Masanell & Ricart, 2010). Internal resources drive the strategy by strengthening core competencies and competitive advantage, with organizations needing to assess resource position and capabilities (Grant, 1991; Beer & Eisenstat, 2000). Combining specialized or cross-functional resources and the IT-based resources can further enhance competitive positioning (Prahalad & Hamel, 1990; Barney, 2001):

- The physical IT infrastructure components from tangible resources,
- The managerial and technical competence of human IT resources, and
- The intangible IT-enabled resources include know-how, customer base, experiences, and knowledge assets.

The Organization's IT infrastructure, including technology, databases, and communication platforms across units, is a critical lasting competitive edge (Keen, 1993; Russo & Fouts, 1997; Wade & Hulland, 2004). It facilitates targeted applications and processes within the supply chain (Barney *et al.,* 2001; Cooper-Hakim & Viswesvaran, 2005). This hub shares information and leverages opportunities for value creation (Barney *&* Mackey, 2005). Grant (1991) defined *"grounded resources"* as human resources, including technical IT skills for programming and managerial IT skills for project coordination. Mowery *et al.* (1998) stressed

the importance of IT human resources for cost-effective applications. Collaborative human IT resources deliver solutions and address risks for ODT (Lepak & Snell, 2002). To boost IT-enabled project performance, intangible resources like organizational culture matter (Wade & Hulland, 2004). Technological expertise at the team and individual level creates sustainable value (Cooper-Hakim & Viswesvaran, 2005; Teece & Pisano, 2003).

In digital transformation, customer data is a critical asset, emphasizing the importance of customer orientation for success (Bharadwaj *et al.,* 2000). Intellectual capital drives creativity and facilitates the application of knowledge throughout the transformation process, helping organizations adapt and innovate (Bititci *et al.,* 1997; Al-Mashari *et al.,* 2003). Effective organizational synergy goes beyond knowledge-sharing, enabling firms to respond to market demands efficiently (Ajzen, 1991; Barney, 1995; Baron & Hannan, 2002). Additionally, complex resource configurations can be difficult to replicate, supporting a sustained competitive advantage in digital space (Collis, 1991; Hamel & Prahalad, 1994; Fenech *et al.*, 2019).

Historically, the RBV focused on resources within organizational control; however, it has limitations when addressing the rapid disruptions and regulatory shifts that digital transformation often entails (Lepak & Snell, 2002). Digital technology has intensified competition and catalyzed innovation in products, revenue models, and distribution channels, requiring organizations to continually adapt their strategies (Fitzgerald *et al.,* 2014; Cohron *et al.,* 2020). For success in this evolving landscape, organizations need strategically position themselves and maintain agility against competitors (Casadesus-Masanell & Ricart, 2010; Aaltonen & Ikävalko, 2002).

2.3.3 Tactical Approach – The Art of War for Managing Change

Sun Tzu's The Art of War, an ancient military treatise, covers warfare's strategic, tactical, political, and economic aspects, serving as the foundation for military strategy; its insights

have extended to modern business management in a competitive landscape (Wee *et al.,* 1996). Sun Tzu highlights that strategy without tactics is the slowest route to victory and tactics without strategy are the noise before defeat. '謀無術成事難，術無謀則必敗' (Lee *et al.,* 1998; Lee & Ko, 2000; Tzu, 2005, pp. 76-79). Sun Tzu states that overcoming positional disadvantages requires tailored strategies and terrain engagement to overcome obstacles and secure favorable outcomes (Wong *et al.,* 1998; Null & Larkin, 2001, pp. 13-19; Tzu, 2005, pp. 26-33).

- 道 Moral Law: Rules and Regulations which the laws of the human Nature and the way of the World,
- 天 Seasonal Factors & Timing: Self-positioning and action timing,
- 地 Landscape or Operational Terrain: Strategic planning and Resources,
- 將 Leadership Qualities: Leader behavioral, Sincerity, wisdom, courage, and benevolence,
- 法 Management Skills: Organization structure, Hierarchical discipline, Operation and logistics, and Methodology.

In ODT, integrating human perspective into operational processes is advocated to influence management decisions that assume human nature impacts thoughts and actions, likened to water's effect on a boat (Rarick, 1996; Null & Larkin, 2001, pp.83-87). Sun's strategic framework emphasizes subjective human initiative, which is vital for competitive advantage and sustainable growth (Wee *et al.,* 1996; Wong *et al.,* 1998; Tzu, 2005, pp. 33-35). '上下同欲者勝' suggests organizational success through aligned desires and collaboration. Management must foster a collective spirit across all levels and cultivate corporate culture, values, objectives, and clear directions while using goals and rewards for motivation (Null & Larkin, 2001; Tzu, 2005, pp. 38-39). Applying '以正合，以奇勝', successful management

balances regulatory structures and agile approaches. Business activities mirror the organization's dimension (Gupta & Govindarajan, 1984; Floyd & Wooldridge, 1992). In recent decades,

Matrix Management emerged for forming and project-focused and has emerged as a strategic framework conducive to forming project-focused structures (Barlett & Ghoshal, 1990). During the ODT progress, akin to intricate military maneuvers that span various units such as IT, sales, and operations, effective navigation necessitates the promotion of cross-functional teams endowed with diverse skills (Barlett & Ghoshal, 1990; Cash *et al.,* 2003; Fitzgerald *et al.,* 2014). These cross-functional units align with Sun's '*Win by Surprising*' principle, as articulated by Wee in 1994b. This approach facilitates continuous improvement and enhances organizational adaptability (DeLone & McLean, 1992; Birkinshaw *et al.,* 2008).

Furthermore, Sun Tzu's strategic framework encompasses five essential constructs that support combat situations (*Figure 10)*. This depiction delineates the interrelationships between each construct and the digital operational domains, providing a comprehensive understanding of the strategic landscape.

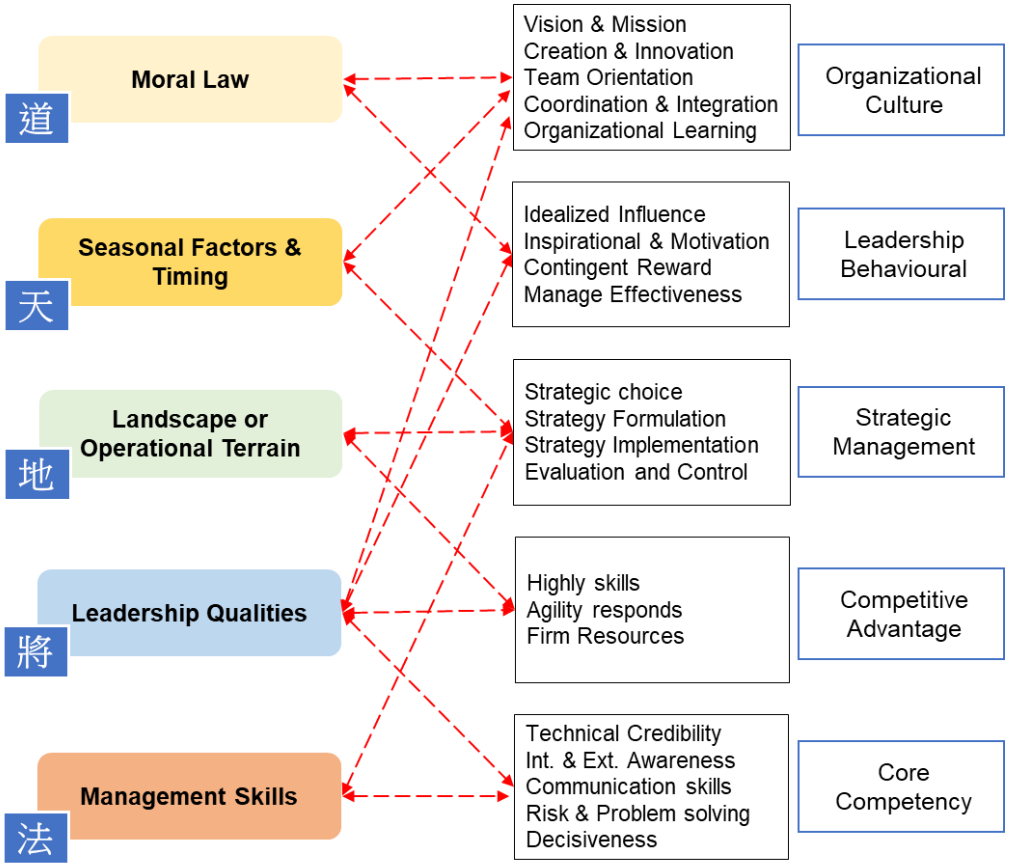

Figure 10: Relationship between Sun's five constructs and digital operating functional domains - By Researcher

Sun Tzu's principle, 'The control of a large force is the same principle as the control of a few men - 凡治眾如治寡，分數是也,' underscores that managing groups depends on division (Gluck *et al.,* 1982; Floyd, 1992; Wee, 1992; McCormick, 2001). Effective command in both contexts relies on established structural norms, necessitating well-designed rules, procedures, and clear structure (Lee *et al.,* 1994, 1998; McCormick, 2001). This strategy implies alignment with rules and regulations, valuing public opinion and respect (Armenakis *et al.,* 1993; Hannan & Freeman, 1984), especially during unpredictable incidents and transformations (DeLone & McLean, 2003).

Effective team performance starts with empowerment and trust (Mathieson, 1991; Anderson *et al.,* 1994; Deci & Ryan, 2000). Leaders should empower capable subordinates for talent growth. Sun's advice, '將者，國之輔也,' stresses coordinated leader-subordinate relationships (Wee *et al.,* 1996). Sun Tzu's Art of War emphasizes trusting and empowering

individuals who understand situations well. As Sun Tzu said, '不知三軍之事 而同三軍之政者，則軍士惑矣,' leaders should avoid excessive interference. Leaders must trust their teams' expertise in digital transformation for aligned decisions (Lee & Ko, 2000; Null & Larkin, 2001). Significant decisions, particularly those related to organizational change and major events, should be aligned with opinions at all levels. For this reason, Sun Tzu highlighted the vital role of qualities such as wisdom, faith, benevolence, courage, and discipline in leaders, as they directly impact the fate of a country (Wee, 1994a; Null & Larkin, 2001). This approach fosters an effective and cohesive digital transformational culture and ensures smoother implementation, avoiding disruptions that may arise from excessive interference in lower-level operations. '*Incentive*' is a psychological term for continuous motivation. Sun Tzu emphasized the importance of *"Lure with benefits"* and *"Entice with advantages":* -'利而诱之, 求之于勢，不責于人，故令之以文，齊之以武' , drawing from warfare tactics to stimulate soldiers' fighting spirit. This approach proves essential for achieving high performance in numerous organizations (Boar, 1995, pp. 78-83; Lee & Ko, 2000). Leaders should adopt a holistic incentive strategy, blending material and spiritual motivations to cultivate a motivated and engaged workforce during organizational digital transformation. Acknowledging individual values and personal growth promotes successful digital initiatives and boosts organizational performance.

Among challenges in today's competitive business landscape, organizations can harness their potential by cultivating strong employee bonds, determination, and survival confidence, which parallels the survival map concept from ancient wisdom (Avolio *et al.,* 2000; Deci & Ryan, 2000). Sun Tzu's emphasis on teamwork as an indispensable tool to address challenges remains pertinent (Wee *et al.,* 1996). His people-centric management idea, depicted as '故善用兵者，譬如率然', promotes communication, agility, and coordination (Wee *et al.,* 1996). Business public relations aims for internal unity and external growth by embodying human resources as '人和' (Gluck, 1982; Wee, 1994b; Wee *et al.,* 1996; Lo *et*

al., 1998). Confronted with problems, individuals unite, showing courage and letting go of biases (Mathieson, 1991; Coff, 1997; Deci *et al.,* 1999, 2000). Sun's counsel, '兵士甚陷則不懼，無所往則固' underscores the leader's role in fostering a no-way-back spirit in their team during crises (Wee *et al.,* 1996; Tzu, 2005, pp.21-24; Null & Larkin, 2001). Experimental psychology highlights the amplified impact of stimuli in groups relevant to change management in digital transformation (Deci *et al.,* 2000). Mutual support during challenges fosters cohesion and emotional resonance, enhancing organizational morale.

Sun Tzu's maxim, '故令之以文，齊之以武,' stresses troop management through care and discipline. Leadership, encompassing traits, skills, behaviours, and practices, profoundly influence and inspire others (Avolio *et al.,* 1999; Antonakis *et al.,* 2003; Fletch, 2012). Effective leadership guides teams during technological changes in digital transformation. '文 *Wen*' signifies empathy and reward, while '武 *Wu'* represents discipline. Modern leadership often blends these approaches to motivate teams. Transformational leadership fosters engagement, interaction, and synergy. Leader influence and knowledge are crucial during ODT, surpassing hierarchical authority. Sun's emphasis on strategic leverage over solely relying on subordinates' capabilities applies to ODT's environmental advantages (Barney, 1995; Lee *et al.,* 1998; McCormick, 2001; Null & Larkin, 2001).

Organizations can draw valuable insights from the ancient wisdom of Sun Tzu's '*Art of War*' to strategize their implementation. Sun Tzu's principles apply to modern digital endeavors, emphasizing planning, adaptive tactics, and leadership. "Knowing oneself and knowing the enemy" equates to understanding an organization's state, strengths, and competition (Miles & Snow, 1984). Leaders' awareness fosters unity and innovation, akin to agility in warfare. Embracing this wisdom enables organizations to navigate digital transformation effectively, securing sustainable competitive advantages.

2.3.4 Proposed H2 Head Domain in ODT

In the business environment, organizations view their digital transformation as a 'pre-emptive attack,' a primary market innovation strategy. This approach entails strategic technology planning under strong leadership to outpace potential industry rivals (Teece *et al.,* 1997, 2016). The goal is to establish a market presence through innovative processes and products, targeting new territories and markets. Strategic management aligns resources and capabilities with objectives to boost efficiency and competitive advantage. An organization's diverse position and tangible capabilities, including know-how, resources, culture, structure, and experience are the foundation of its success (Barney, 1991). This perspective aligns with Yu's *'Head'* domain description, where directional planning, clear responsibilities, and structural alignment are crucial for achieving goals (Yu, 2020). Yu further highlights that the 'Head' domain functions like the steerer of a dragon boat, guiding its direction based on the drummer's rhythm and the rowers' efforts.

During the ODT, failures can arise from multiple factors, particularly organizational and human dynamics, rather than technological issues (DeLone & McLean, 2003; Fitzgerald *et al.,* 2014). These causes can be rooted in internal elements or influenced by external environmental and social factors. Thus, aligning digital transformation with strategic planning becomes a crucial organizational priority (Somers & Nelson, 2001, 2003; Hrebinia, 2006). IT-enabled strategic planning is essential for defining clear business objectives that guide targeted project implementation which are closely linked to the organization's competitiveness (Hanafizadeh *et al.,* 2011; Bharadwaj *et al.,* 2013).

Effective strategy translation and communication across organizational levels which involve an artful management approach (Paquette, 1991; Yu, 2020). Hence, standard operational procedure and identification of business goals are prerequisites for transformative projects. The McKinsey *7S* Model, introduced by Tom Peters and Robert Waterman in the early 1980s, remains a vital tool for measuring organizational development. Comprising variables such as *'Strategy,' 'Structure,' 'System,' 'Staff,' 'Style,' 'Skills,'* and *'Shared Values,'* this model

offers a comprehensive view of an organization. While 'Hard' elements like Strategy, System, and Structure form the tangible foundation, the 'Soft' elements—Staff, Style, Skills, and Shared Values—drive planned activities (Leonard-Barton, 1988; Grant, 1991; Hanafizadeh *et al.*, 2011). A well-designed infrastructure provides the necessary framework to support change initiatives, including technology, processes, and communication channels (Barnet & Mackey, 2005; Fenech *et al.,* 2019). It ensures that resources are allocated efficiently, workflows are streamlined, and information is accessible, thereby minimizing disruptions and enhancing operational continuity during transitions.

Human resources management also plays a crucial and unique role in aligning HR practices with change objectives. Initiating the digital transformation journey involves establishing overarching organizational goals and a method for their realization (Al-Mashari *et al.,* 2003; Casadesus-Masanell & Ricart, 2010). Strategic digital planning aims to enhance performance by aligning competence with technological capabilities to meet transformational requirements (Wright *et al.,* 2001; Somers & Nelson, 2003). This includes strategic workforce planning, continuous training and development, and effective communication strategies. However, their ability to manage change's emotional and psychological aspects sets them apart. A distinctive digital transformation strategy involves selecting appropriate digital technologies and preparing the business model for change (Tekic & Koroteev, 2019; Udovita, 2020), highlighted by Yu's (2020) study on China's COVID-19 strategy, which adeptly balances emergency and long-term goals. The internal characteristics of the digital transformation strategy's structure controllability, centralization, formalization, standardization, and specialization—play key roles (Morton & Hu, 2004; Matt *et al.,* 2015).

Strategy specialization involves aligning skills and knowledge with workloads, considering task behaviour and market sensitivity to meet objectives. These business practices are essential in organizational change management. They provide strategic direction and

actionable steps to achieve desired outcomes, including clear goal setting, resource allocation, and performance monitoring. Organizations can manage change efficiently, minimize disruptions, and achieve milestones by implementing structured plans and timelines. Effective collaboration and stakeholder engagement are also critical, ensuring everyone is aligned with the change objectives. Ultimately, well-crafted business tactics drive successful change initiatives, enhancing organizational agility and competitiveness. According to Yu (2020), organization shapes and executes strategies, encouraging lower-level innovation and fostering dedication. Strategic management, either descriptive or prescriptive, involves resource allocation and long-term planning (Prahalad & Hamel, 1990; Barney, 1995). Yu's 3H framework features the Head domain's significance in facilitating planning and maintaining execution, driving organizational effectiveness, strategy planning, formalization, and processing within the holistic management framework.

2.4 The Hand Elements (Competences and Measurement) and ODT Relationship

2.4.1 Competence-based View and Organizational Transformation

A competent individual leading a capable organization holds more value than numerous ineffective individuals (Prahalad & Hamel, 1997). Porter (2008) underlined how industry structure and competitors' actions shape competition levels. His Five Forces model defines this industrial structure and guides strategic decisions (Structural Analysis). Traditionally, excellence arises from expanding market segments and leveraging industrial structure (Prahalad & Hamel, 1997; Kandampully, 2002). Leonard–Barton (1992) claimed the need to influence market dynamics, which is the viewpoint enhances external market segments and industrial structure to create a competitive edge. Organizations striving for competitive advantage face external challenges related to market segmentation, industrial trends, and resource allocation (Teece *et al.,* 1997; Nath *et al.,* 2010). Scholars explore competitive advantage development through internal perspectives, focusing on resource and capability

growth. However, an exclusive focus on existing competitors may need to pay more attention to dynamic industry changes (Zott, 2003; Birkinshaw *et al.,* 2009; Smith & Lewis, 2011).

In a rapidly changing environment, organizational inflexibility can lead to a competitive disadvantage (Peteraf, 1993; Hamel, 1994). Senior management emphasizes 'sustainable competitive advantage,' aligning with adaptability (Bogner & Thomas, 1992; Hamel, 1994; Javidan, 1998). Efforts to nurture competitive advantage become a dynamic capability shaping an organization's trajectory (Leonard-Barton, 1992; Prahalad & Hamel, 1997). Various forms of competitive advantage are identified: product, marketing, manufacturing, R&D, innovation, technology, and external relations (Ahire *et al.,* 1996; Mascarenhas *et al.,* 1998; Lawson, 1999). Rumelt (1984) outlined three conceptual perspectives on organizational competitive advantage: 1) *RBV – Resource-based view,* 2) *CBV – Competence-based view*, and 3) *DCV – Dynamic capability view*; these theories are interconnected, with later concepts often addressing limitations in the earlier ones. Scholars have dissected these theories to define the components of sustainable competitive advantage for organizations.

Regarding digital transformation's competitive advantage, Smith & Tushman (2005) expanded on Wernerfelt's (1984) and Barney's (1991) theories, they proposed that an organization's digital assets and capabilities result from accumulating digital-enabled competencies and strategic asset allocation, deviating from traditional competitive factors like industrial structure and market segments. These strategic resources, encompassing organizational assets and capabilities (Lippman & Rumelt, 1982; Barney, 1991), include controlled assets such as production, operations, information, know-how, knowledge, and organizational traits, which can enhance efficiency through technology adoption. Therefore, cultivating strategic resources before digital transformation establishes a unique competence, providing a competitive advantage over rivals (Baer & Frese, 2003; Nath *et al.,* 2010; Matt *et al.,* 2015).

Scholars emphasize corporate resilience and competency as vital core capabilities contributing significantly to an organization's competitive advantage (Mowery *et al.,* 1998; Mascarenhas *et al.,* 1998). Organizational digital competencies arise from collective learning within the business, manifesting in various activities and procedures, distinguishing themselves across products and markets (Mithas *et al.,* 2013; Ng & Kee, 2018). The various competitive advantage perspectives between RBV and CBV describe and organize as show below (*Table 7*).

	Resource-Based View (RBV)	**Competence-Based View (CBV)**
Organization Formation	Strategic Resources: • Combination of Assets and Capabilities • Conceptual of Accumulated 1) Tangible assets. 2) Intangible assets. 3) Capabilities from business activities	Progressively collective through learning, workflows, processes, and structure: 1) Tangible assets. 2) Intangible assets. 3) Capabilities from managing and system
Environmental	Organizational internal environment	Start with the internal organizational environment and consider external
Competitive advantage composition	Strategic resources consisting of assets and capabilities	A combination of assets and capabilities
Competitive advantage attributes	Valuable, uniqueness, unimitated, and difficult to replace	Collective process for value and uniqueness
Methodology	Strategic planning, manage and develop the required assets and capabilities	Through activities, processes, and learning to enhance its assets and capabilities
Literatures	Wernerfelt (1984) Barney (1986, 1991, 1995) Prahalad & Hamel (1990) Collis (1991, 1994) Grant (1991) Mahoney & Pandian (1992) Wright *et al.,* (2001) Al-Mashari *et al.,* (2003)	Prahalad & Hamel (1994) Hamel (1994) Teece et al. (1997) Sambamurthy *et al.* (2003) Helfat & Peteraf (2003). Wade & Hulland (2004) Zahra *et al.* (2006)

Table 7: The various competitive advantage perspectives in between RBV and CBV

Emerging technologies are pivotal assets for organizations in this competitive landscape (Nah & Delgado, 2006; Foss & Saebi, 2017). An organization's competitive digital advantage hinges on resource allocation's performance for agile responses to digital transformation (Mithas *et al.,* 2013; Gurumurthy *et al.,* 2020, pp. 134-139). Utilizing digital technology and training, the organization pursues differentiation through products and services, emphasizing manufacturing as a business platform. Investment and business development performance are paramount (Sambamurthy *et al.,* 2003; Porter & Heppelmann, 2014; Westerman & Bonnet, 2015). Organizational performance forms the core competency, making competitive advantage complex to explain (Helleuloid & Simonin, 1994), and integrates resources and capabilities cohesively for effective operations, spanning functions, products, and businesses (Teece *et al.,* 1997; Zahra *et al.,* 2006; Teece, 2007)

2.4.2 Dynamic Digital Competence Sustainable Practice

Teece *et al.* (1997) proposed that an organization's competitive advantage stems from integrating intellectual assets, complementary resources, and specific business activities along an evolutionary trajectory. These activities encompass procedures, routines, production processes, and learning, all managed cohesively, and such strategic evolution involves technologies, knowledge, intellectual property, databases, relations, human resources, suppliers, and competitors (Teece, 1992; Helfat & Peteraf, 2003, 2015). Organizational digital dynamic capabilities refer to the capacity to adapt internal and external technological capabilities to a changing environment. This dynamic capability fosters new advantages within established paths, including adaptability, flexibility, and contingency underline this concept (Hafeez *et al.,* 2002; Nath *et al.,* 2010).

ODT's competitive advantage journey integrates diverse resource values, distinct technological capabilities, and dynamic competency development (Amit & Schoemaker,

1993; Teece *et al.,* 1997; Miyazaki, 1999; Fitzgerald *et al.,* 2014). In organizational competition, individuals compete for indivisible resources, resulting in significant rivalry, while digital transformation equips organizations with a measurable competitive advantage to secure these resources. The performance competency of this advantage is observed across various groups within the organization. Economic shifts can undermine this advantage, prompting dynamic capabilities for resource allocation, competency restructuring, and performance enhancement (Hafeez *et al.,* 2002). The increasing digital transformation adoption has become a strategic business tactic. Integrating valuable digital resources, collective knowledge, distinct competencies, and dynamic capabilities shape the core sustainable competitive advantage elements (Fitzgerald *et al.,* 2014).

- **Valuable Digitalize Resources**

Organizational dynamic competency is through strategic development, encompassing tangible and intangible corporate resources, emphasizing value (Barney, 1991; Dosi *et al.,* 1992; Kogut & Zender, 1992; Henderson & Cockburn, 1994; Sanchez, 2004). All resources deployable or attainable for digital transformation goals warrant consideration. These assumptions extend organizational resources beyond conventional boundaries, particularly in emerging industries or models with outsourced production activities; thus, an organization must redefine valuable digital resources into three types (Sambamurthy *et al.,* 2003).

- Physical assets, including machinery, computers, data centers, equipment, production plants, and offices.
- Knowledge assets, encompassing digital technology, intellectual property, branding, corporate reputation, and customer data.
- Relationship assets, comprising corporate culture, supplier-customer relationships, and social and political connections.

Baer & Frese (2003) suggested that organizations enhance competitive resources and develop new competency norms for digital transformation. McDonald's, the world's leading food service retailer, operates in over 38,000 locations across more than 100 countries (Physical assets). To maintain its competitive edge, McDonald's leverages its global network (Relationship assets) and uses cost-competitive knowledge assets (Knowledge assets) supported by strong food production processes. CEO Chris Kempczinski introduced the 3D strategy (*Digital, Delivery, and Drive-thru*) before the pandemic amid rising labour costs, especially for cashiers in the competitive fast-food sector. This novel competency norm enhanced digital experiences, personalized dining, and this strategy effectively addresses cashier shortages, bolstering business via virtual, boundaryless operations.

- **Integrating Capabilities –Distinctive Competencies**

Wernerfelt (1994) defined *organizational resources* as tangible and concrete assets that support an organization in improving operating practices and achieving its objectives. These encompass physical resources, human resources, and organizational resources (Wernerfelt, 1984; Grant, 1991; Marino, 1996; Doz, 1997). Digital capabilities are part of organizational resources but possess unique characteristics (Yoo, 2010), such as rarity, inimitability, and non-substitutability, resulting from resource deployment and scheduling procedures (Kandampully, 2002). Digital technological capacity combines resources to perform specific tasks using unique technologies for targeted areas (Zimmermann *et al.,* 2018). Although resources can exist alone, capabilities are deeply embedded in organizational resources, processes, practices, and activities (Nanda, 1996). Value and uniqueness are common characteristics across resource-based, capability-based, and dynamic capability perspectives, becoming critical differentiators of firm capabilities (Prahalad & Hamel, 1994,1997; Beer *et al.* 2005).

Nah and Delgado (2006) emphasized the necessity of integrating an organization's digital

competitive strategy into its fundamental structure and everyday functions. This integration initiates a continuous process of augmenting and broadening assets, capabilities, and resources through what they term *'competition for competencies.'* An example is Canon, a long-standing player in optical and imaging since the 1950s. Their roots lie in quality manufacturing and value engineering. It expanded into microelectronics R&D within the optical industry while managing its dealer networks. This resource-driven strategy enabled Canon to seize new business opportunities, including digital cameras. This approach leverages operational strengths to develop and reinforce competencies, demonstrating adaptability to changing market dynamics. During the ODT, the organization integrates digital strategy into the core, and nurturing competencies remains relevant, forming a solid foundation for embracing digital age challenges and opportunities.

- **Collective Capabilities presents Organizational Competency**

In achieving organizational excellence, core competencies require active engagement, continuous learning, and unwavering commitment across all levels and units. This imperative stems from the understanding that adopting new paradigms and surpassing benchmarks demands collective efforts beyond traditional boundaries (Prahalad & Hamel, 1997). 3M's global success is not solely rooted in visionary strategies; it thrives by blending inventive engineering and an experimental culture (Brand, 1998; Alldredge & Nilan, 2000). Managing this advantage necessitates cumulative and shared efforts. 3M's autonomous and innovative ethos fosters fresh business methodologies driven by various factors (Mata *et al.,* 1995; Teece *et al.,* 1997; Alldredge & Nilan, 2000).

Similarly, collective capabilities are pivotal in the digital transformation landscape; these encompass knowledge sharing, cross-disciplinary collaboration, agile challenge resolution, innovation, and needed support that leverage functions and capabilities to empower digital growth initiatives (Sousa & Rocha, 2019; Kandampully, 2002). This symbiotic approach

anchors successful digital transformation and underscores unity's enduring significance in organizational advancement.

- **Dynamic Competency in ODT practice**

Scholars highlight the need for organizations to possess more than unique resources to remain competitive in a dynamic economic environment (Prahalad & Hamel, 1990; Teece *et al.,* 1997). Changes in technology and the market can render certain advantages obsolete. The composition of competitive advantages may shift due to unforeseen industry changes, affecting their value to the organization (Leonard-Barton, 1992; Brynjolfsson & Hitt, 2000; Birkinshaw *et al.,* 2008). Sharing and utilization can significantly enhance competitive advantage (Prahalad & Hamel, 1990). In technology sectors like semiconductors and computers, a lack of dynamic competitive advantage can transform into a rigid advantage in the future (Leonard-Barton, 1992; Bogner & Thomas, 1992; Reed *et al.,* 1990; Teece *et al.,* 1997). In digital transformation, IT scholars argue that competitive advantage must be consistently upgraded and developed through fundamental capabilities (Baer & Frese, 2003; Bharadwaj *et al.,* 2013; Cascio & Montealegre, 2016).

Sanchez and Heene (1997) expressed that organizations with dynamic, solid capabilities can efficiently reallocate resources and restructure to seize technological and market opportunities, particularly in digital transformation. In the dynamic digital landscape, adaptability is essential for competitiveness. Embracing digital technologies empowers organizations to optimize operations, enrich customer experiences, and explore new markets (Bharadwaj *et al.,* 2013; Hansen & Schaltegger, 2016). For instance, Motorola's adept adoption of digital manufacturing capabilities facilitated diversification into the communication and consumer electronics sectors. Rapidly leveraging semiconductor knowledge enabled Motorola to pioneer advanced electronic devices, showcasing its prowess in the digital age.

While digital transformation can yield sustained competitive advantages, it may also introduce inertia, limiting external information access and operational efficiency. Organizations must balance leveraging digital capabilities and exploring novel opportunities to uphold competitiveness (Dosi *et al.,* 1992; Foss & Saebi, 2017). In this evolving milieu, digital capabilities demand flexibility, adaptability, and learning from failures. Nurturing a continuous improvement and innovation culture is pivotal for robust dynamic competencies in successful digital transformation (DeLone & McLean, 1992; Fitzgerald *et al.,* 2014). Strategic alignment and efficient resource utilization empower organizations to harness digital technologies, securing sustainable competitive advantages in the ODT journey.

2.4.3 Measurement Tools for Digital Transformation

Boutetiere & Reich (2018) presented *'Change is Hard, Digital Transformation is Harder;* the challenges of digital transformation, as it involves complex and critical practices that require collaboration across all levels of an organization. Despite many organizations having planned digital strategies, the successful execution rate still needs to improve (Sambamurthy *et al.,* 2003). ODT is a lengthy and technology-enabled change process, necessitating a comprehensive measurement tool for effective change management. It provides direction for leveraging corporate resources, motivating teams, conducting progress reviews, providing feedback, and facilitating effective communication to achieve key performance indicators (Yoo, 2010; Westerman *et al.,* 2014). The implementation of the balanced scorecard (BSC) has become a prevalent approach in organizations to address inconsistent strategy execution. The BSC facilitates regular discussions about strategic objectives and tracks progress by serving as a measuring and monitoring tool (Kaplan & Norton, 1992). However, it is noteworthy that despite adopting the BSC, many management teams still allocate limited time to engage in strategic discussions, underscoring the persistent need for enhancing strategy execution practices.

- **Balanced-Scorecard (BSC)**

In the 21st century's knowledge economy era, innovation, sharing, and application of knowledge have emerged as critical factors in the competitive landscape. The organization's value is no longer solely reliant on tangible assets; intangible assets now play an inclusive role. Kaplan and Norton (1992, 1996a) introduced the balanced scorecard (BSC), which extends beyond traditional short-term and past financial indicators. This performance measurement tool emphasizes the significance of future economic performance indicators. The BSC provides valuable insights for organizations aligning their financial outcomes with the appropriate digital initiatives, delving into four characteristic perspectives: financial, customer, internal processes, and learning and growth (Figge *et al.,* 2002; Kaplan & Norton, 2006b). In the digital era, effectively utilizing knowledge and digital resources can significantly impact an organization's competitive advantage and long-term success (Svahn *et al.,* 2017). The BSC's incorporation of digital-oriented indicators allows organizations to gauge their digital maturity and align their transformation efforts with strategic goals. Consequently, the BSC serves as a compass, guiding organizations through the complexities of the digital landscape and fostering a culture of continuous improvement and adaptation.

This comprehensive performance measurement methodology integrates corporate strategy metrics to predict future economic performance. It builds customer relationships, innovates internal procedures, and fosters employee learning and growth. Compensating for the lack of backward indicators *(Financial Performance Indicators - FPI)* provides a balanced view of performance. However, Lipe & Salterio (2000) suggested that managers often prioritize general financial indicators while overlooking non-financial categories. Consequently, management should be cautious about relying solely on financial indicators, which may lead to an imbalance in risk considerations (Chen & Dodd, 1997; Liberatore & Miller, 1998; Maiga & Jacobs, 2003).

- **Digital Sustainable Balanced Scorecard (DBSC)**

In the journey of the ODT, challenges emerge from internal and external factors influencing implementation (Nah & Delgado, 2006; Foss & Saebi, 2017). Research indicates many unsuccessful ODT efforts, often due to regulatory oversights. Despite its technological nature, the triumph of ODT hinges largely on human-driven implementation. Successful project outcomes demand a structured strategic architecture and consistent progress assessment (Galliers, 1991; Fichman *et al.,* 2014; Foss & Saebi, 2017). ODT involves networking, value chain optimization, and application, requiring communication, analysis, exchange, and collaboration skills (Schallmo *et al.,* 2017; Shaughnessy, 2018).

In the past two decades, the Balanced Scorecard (BSC) has widely been employed in both public and private organizations for reporting and performance measurement (Kim *et al.,* 2003; Rodríguez *et al.,* 2010). According to a global survey by 2GC management consultants (2020), over 88% of respondents used the BSC for strategic management, while over 63% applied it for operational management. Organizations in 71 countries reported employing multiple BSCs to align objectives with strategic actions. Most (73%) balanced scorecards were internally designed before implementation, with 96% frequently updating them to reflect changing objectives, targets, and metrics. Berghaus and Back (2016) propose a framework that evaluates digital strategy transformation through three key components:

1. **Cause-and-effect Analysis:** This step examines how actions and initiatives relate to ODT outcomes, helping pinpoint areas for improvement.

2. **Performance Unit Drivers:** It identifies factors influencing strategic goal achievement, offering insights into decision-making.

3. **Financial Impact Assessment:** This phase links digital transformation outcomes to

financial indicators, facilitating a comprehensive evaluation of strategic efforts.

The ODT leadership is pivotal in driving teams, establishing causal relationships, and building the Balanced Scorecard model which links with core competencies, drivers, and team assembling are vital for goal achievement (Rabbani *et al.,* 2014; Sebastian *et al.,* 2017; Hansen & Schaltegger, 2016, 2018). Kaplan and Norton (1996) propose categorizing measures as *'Leading and Lagging'* for effective progress monitoring. The ODT leaders should prioritize lagging measurements, which contrast past indicators with current leading status, metrics extend beyond finance, encompassing employee skills, quality progress, time duration, and more (Ip & Koo, 2004; Nah *et al.,* 2001; Mergel *et al.,* 2019). The Balanced Scorecard, though finance-oriented, benefits from a broader focus, and progress information aids in managing competitive operations and identifying profitability (Kaplan & Norton, 1992; Stalk *et al.,* 2012). Like the McKinsey 7-S model, organizational transformation involves design elements like units, structure, staff, strategy, skills, style, systems, and values (Kaplan, 2005a, 2006b) and performance evaluation varies by scale, sector, knowledge, and weighted KPIs, amid uncertainties, digital transformation measurement requires consideration of diverse factors (Teo & Choo, 2001; West *et al.,* 2004; Porter & Heppelmann, 2014).

In a 2015 study, Kane *et al.* (2015) emphasized that the DT strategy's significance in organizations, aligning with the four perspectives mentioned earlier. Measurement standards for DT initiatives must integrate various digital strategic themes into their strategy. Sustainability assessment and change solutions require adapting the DBSC, adding DT goals and sustainability attributes (Sebastian *et al.,* 2017; Hansen & Schaltegger, 2018). During the rapid technological changes, two approaches are suggested for organizational sustainability: introducing new sustainability perspectives to the BSC or integrating sustainability metrics with the four perspectives (Butler *et al.,* 2011). Svahn *et al.* (2017) proposed a Digital Sustainable Balanced Scorecard (DBSC), incorporating indicators within

the four perspectives: Sales & Performance, Customers satisfaction, DT processing and Organizational Capacity (*Figure 11*).

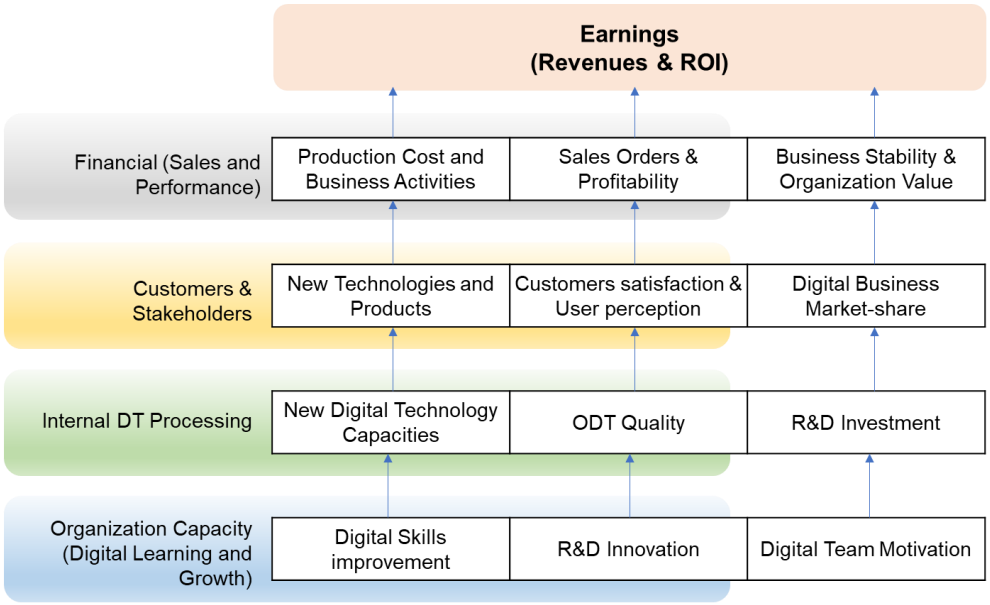

Figure 11: DT relative elements among the four characteristic perspectives to support ODT – By Researcher

This DT strategy architecture should encompass digital skills, innovation, customer satisfaction, new technologies, processes, cost, time, new segments, and revenue (Svahn *et al.,* 2017). The DBSC supports ODT and accelerates DT performance with chosen elements as relevant KPIs and management performance evaluations (*Table 8*). This synthesis offers insights into applying the DBSC model for ODT support.

DBSC	Performance Areas	KPI index
Organization Capacity (Digital Learning & Growth)	✧ Digital Skills improvement ✧ R&D Innovation ✧ Digital Team Motivation	• Cost of training per employee • Productive of Employees • Digital Knowledge Sharing • Technological Know-how • Technology Qualification • Informatization Capacity Index
Internal DT Processing	✧ New Digital Technology Capacity ✧ ODT Quality & Work Efficiency ✧ R&D Investment	• Possession of IP Rights • Application of Technology Development • Compliance and Policy • Defect rate • R&D Cost to Revenue
Customers & Stakeholders	✧ New Digital Products and Service ✧ Customers Satisfaction ✧ User Perception ✧ Digital Business Market-share	• Corporate Image • Consumer Satisfaction Index (CSI) • ISO • Employee Transfer Rate • Market Share
Financial (Sales and Performance)	✧ Production Cost ✧ Business Activities ✧ Sales Order & Profitability ✧ Business Stability ✧ Organization Value	• Cost of Sale Ratio • ROI • New Order Volume • Debt Ration & T/O of Total Liabilities • Net Worth and Valuation

Table 8: Management Performance evaluation on four perspectives – by researcher

2.4.4 Proposed H3 Hand Domain in Organization's Digital Transformation

A successful ODT is complicated, with obstacles requiring pre- and post-process considerations (Matt *et al.,* 2015; Gurbaxani & Dunkle, 2019). While technical aspects are essential in the ODT, managed activities and knowledge are key (Brynjolfsson & Hitt, 2000). Leveraging internal and external knowledge is crucial for ODT core competence (Stalk *et al.,* 2012; Bharadwaj *et al.,* 2013). The *'Hand'* domain, like a dragon boat's engine, influencing organizational competency beyond technology and human factors (Nah & Delgado, 2006; Fichman *et al.,* 2014). Ross *et al.* (2006) argued that constructing operational backbones is imperative for maintaining core operational efficiency during the transformative process. For effective digital transformation, organizations must chart a scalable operational backbone (Floridi, 2014; Berghaus & Back, 2016) by understanding capabilities, including development needs (Rabbani *et al.,* 2014; Mergel *et al.*, 2019). These encompass data analysis, tech utilization, strategy, communication, collaboration, and innovation (Fichman *et al.,* 2014; Hansen & Schaltegger, 2016). Core competencies offer a competitive edge through unique skills and knowledge (Stalk *et al.,* 2012; Gurbaxani & Dunkle, 2019). Dynamic digital competence is crucial for organizational digital transformation. It involves continuously updating skills and knowledge to leverage emerging technologies effectively. This competence ensures employees can adapt to new digital tools and processes, fostering innovation and efficiency. Organizations can swiftly respond to market changes and technological advancements by promoting continuous learning and agility. Ultimately, dynamic digital competence empowers organizations to stay competitive, drive growth, and successfully navigate the complexities of digital transformation.

Constant assessment and adaptation are important in evolving tech trends which customer focus, agile culture, and ethical AI are critical in digital transformation, and integrating these elements positions organizations for sustainable digital growth (Verhoef *et al.,* 2010; Floridi,

2018). Project measurement tools are essential in organizational digital transformation, providing metrics to evaluate progress and effectiveness. These tools track *key performance indicators* (KPIs), such as productivity, user engagement, and ROI on digital initiatives. By analyzing data, organizations can identify areas for improvement, ensure alignment with strategic goals, and make informed decisions. Practical measurement tools also facilitate transparency and accountability, helping stakeholders understand the impact of digital transformation efforts. Ultimately, they guide organizations toward successful and sustainable digital change. Yu emphasized that in the 'Hand' domain, despite the precision of strategy or planning, the ultimate success of any effort relies heavily on the frontline workforce. These individuals possess diverse occupational skills, including but not limited to HR processes, marketing and selling expertise, finance proficiency, IT knowledge, and various functional techniques. Their collective capabilities are indispensable in the efficient execution and implementation of organizational processes. Regardless of the sophistication of overarching strategies, the frontline workforce's adeptness in translating these plans into action ultimately determines the achievement of organizational objectives (Yu, 2020)

2.5 Chapter Two Summary

This chapter critically analyses Yu's 3H management framework, exploring its three core domains – Heart, Head, and Hand: as a guiding paradigm for ODT. The framework emphasizes a holistic approach, recognizing that successful digital transformation depends not solely on technological advancements but also on the strategic alignment of leadership, workforce engagement, and operational execution. It highlights the need for robust change management strategies and practical knowledge dissemination across all organizational levels to foster adaptability, resilience, and innovation.

Heart Domain: The Human-Centric Foundation

The Heart domain represents the human element in digital transformation, emphasizing

leadership, organizational culture, motivation, and engagement. Effective transformation requires leadership that inspires values and fosters a collaborative culture. Employee attitudes, beliefs, and behaviours significantly influence the success of ODT, as resistance to change can impede progress. This domain advocates transparent communication, emotional intelligence, and ethical leadership. Furthermore, it underscores the importance of cultivating a shared vision – a "*One Heart, One Desire*" culture that unifies employees, reduces friction, and fosters a proactive transformation mindset.

Head Domain: Strategic Planning and operating with directional alignment

The Head domain represents the cognitive and strategic aspect of digital transformation, focusing on decision-making, resource allocation, and structural alignment. This domain is concerned with formulating clear transformation strategies, structured planning, and performance monitoring to ensure alignment with organizational objectives and market demands. The application of business models, governance frameworks, and structured execution plans ensures that digital initiatives are scalable, adaptable, and aligned with both internal capabilities and external opportunities. The McKinsey 7S model and other strategic frameworks illustrate the importance of structural and cultural coherence in maintaining competitive advantage. Effective ODT requires foresight, flexibility, and a structured roadmap integrating technology adoption with business goals.

Hand Domain: Execution and Operational Competence

The Hand domain focuses on operational execution, emphasizing the role of the frontline workforce in implementing digital transformation strategies. While leadership and strategic planning provide direction, transformation success depends on practical implementation, workforce competency, and process efficiency. This domain aligns with the concept of a scalable operational backbone, ensuring that organizations can efficiently integrate new technologies, streamline workflows, and maintain core operational efficiency. It highlights

the significance of continuous skill development, process optimization, and project performance measurement to track transformation progress. Key performance indicators (KPIs), agility in execution, and data-driven decision-making are central to ensuring the long-term sustainability of digital transformation efforts.

This chapter advocates for a comprehensive capability assessment, enabling organizations to identify skill gaps and align technological investments with business capabilities. While Yu's 3H framework provides a structured approach to managing ODT, the researcher recognizes the need to explore further external factors influencing transformation success, including market forces, technological advancements, and competitive pressures. Future discussions should investigate whether these three domains sufficiently capture the complexity of digital transformation or if additional dimensions, such as regulatory adaptation, and emerging AI-driven business models, should be considered to refine ODT strategies.

CHAPTER THREE – RESEARCH METHODOLOGY

3.1 Introduction

This study endeavors to comprehend the intricate relationship between Yu's 3H domains and the critical success factors of Organizational Digital Transformation. An *Exploratory Sequential Mixed Method* (ESMM) research design has been selected as the principal investigative approach. By integrating diverse elements of qualitative and quantitative methods, this design facilitates an in-depth exploration of the phenomenon under investigation. This approach allows researchers to harmoniously blend different research methods, thereby enabling a comprehensive examination of the subject matter within the confines of a single study.

This research design represented the third paradigm in research, thereby presenting an opportunity to bridge the longstanding gap between qualitative (QUAL) and quantitative (QUAN) research paradigms. This methodology started with a qualitative exploration of the research problem; it then developed codes in an exploratory manner using data. Further, it comprised a quantitative measurement instrument for interpreting and clarifying data. This method enhanced communication across academic fields, providing concise notation for the research process. It emphasized scholarly rigour to deepen subject understanding, yielding valuable insights and informed conclusions (Fetters *et al.,* 2013).

3.2 The Need to Conduct Useful Research on Change

Over recent decades, scholars have thoroughly examined Organizational Digital Transformation, offering organizations critical insights into areas for improvement, strategies for achieving transformation goals, and uncovering new opportunities for digital advancement. The researcher adopted an Exploratory Sequential Mixed-Methods (ESMM) design, which integrates both qualitative and quantitative approaches in a comprehensive two-phase process, spanning the full research cycle—from research question definition

through to data collection, analysis, and interpretation.

The ESMM approach began with structured focus group interviews, engaging a diverse group of business executives, senior management, IT specialists, and unit heads from various cultural and national backgrounds. This first phase gathered qualitative data, which guided the development of a survey instrument. The findings from the literature review and phase one insights informed the construction of a quantitative questionnaire in the second phase, aiming to identify ODT success factors about the 3H framework (Heart, Head, and Hand) across the domains of H^1, H^2, and H^3. By emphasizing qualitative and quantitative data equally, this approach allows testing theoretical propositions derived from qualitative analysis and measuring dependent variables that comprehensively capture ODT factors.

The mixed-methods design benefits from multidimensional insights into complex social phenomena, as noted by Greene *et al.* (1989) and Baruch & Holtom (2008), overcoming the limitations of single-method approaches. Using structured quantitative surveys allowed consistent data collection for reliable comparisons across groups or periods (De Vaus, 2001; Wright, 2005), reducing subjective bias relative to focus group interviews and enhancing objectivity. As a result, the quantitative phase yielded seven domains tied to digital transformation, reflecting the outcome of the rigorous investigation.

This study employed a "conversion mixed approach," transforming qualitative data into quantitative measures for statistical analysis, facilitating integrated interpretations of findings (Cameron, 2009; Teddlie & Tashakkori, 2012; Guest, 2013). During the inference phase, original and transformed data were analyzed to provide robust interpretations (Onwuegbuzie & Combs, 2011; Fetters et al., 2013). By refining the research questions through phase, one's qualitative data and subsequently validating hypotheses with quantitative analysis, this study aligned with Edmonds and Kennedy's (2017) mixed-method approach recommendations.

The structured, exploratory sequential mixed-method approach adopted here provided a rich, multidimensional view of ODT's complexities, offering theoretical insights alongside actionable recommendations for digital transformation practices. Integrating qualitative and quantitative findings underscores the potential for ESMM to yield practical and adaptable frameworks, enabling organizations to navigate the dynamic digital landscape effectively (see *Table 9*).

Mixed-methods Promise	Potential Advantages	References
Flexibility and Responsiveness	Customise the specific questions and contexts, allowing diverse qualitative and quantitative data collection and analysis methods to address research inquiries effectively.	Onwuegbuzie & Johnson (2006); Clark *et al.* (2008); Creswell *et al.* (2011); Teddlie & Tashakkori (2012)
In-depth exploration	Examines the research problem through observations, delving into stakeholders' experiences, perspectives, and behaviours within the transformation process and generating hypotheses for subsequent quantitative validation.	Rabiee (2004); Onwuegbuzie & Johnson (2006); Clark *et al.* (2008); Dilshad & Latif (2013)
Address complex research questions	Informing hypothesis or theory development, subsequently, quantitative testing of these hypotheses occurs, resulting in a powerful tool for tackling multifaceted research questions.	Podsakoff *et al.* (2003); Cameron (2009); Guest (2013)
Enhanced Generalizability	Utilizing larger sample sizes bolsters findings' statistical analyses and empowers researchers to make broader applicable assertions about the research problem.	Teddlie & Tashakkori (2006, 2012); Driscoll *et al.* (2007); Onwuegbuzie & Combs (2(011)
Triangulation of data	Incorporating all data facilitates the triangulation of results to enhance the findings' validity, credibility, and reliability, instilling greater confidence in the conclusions drawn.	Driscoll *et al.* (2007); Onwuegbuzie & Johnson (2006); Onwuegbuzie & Combs (2011)

Table 9: Promises and Potential Advantages of Mixed Methods – By Researcher

3.2.1 Research Paradigm

This research paradigm encompassed a system of beliefs, values, and assumptions that guide the researcher's investigation, and establishes a conceptual framework for understanding the nature of the phenomenon under study and provides validated approaches to inquire into specific research questions or problems. Additionally, the two-phase design, characterized by the flexibility of the ESMM, allows the researcher to draw upon multiple paradigms and methodologies when addressing intricate research inquiries. In this study, the ESMM design aligned with three primary paradigms: *Interpretive, Positivist, and Constructive* approaches.

3.2.2 Interpretive Paradigm

The researcher aims to ascertain the significance and meaning of social phenomena by comprehending the perspectives and experiences of those involved (De Vaus, 2001; Fetters *et al.,* 2013). This research paradigm finds prevalent application within anthropology, sociology, and education, focusing on the sociocultural context of human behavior (Blaxter *et al.,* 2010; Maarouf, 2019). The interpretive paradigm finds utility in the initial phase of research, where qualitative data is gathered and analyzed (Scotland, 2012). In the context of an organizational digital transformation, this study employs the interpretive approach to conduct in-depth focus group interviews with business executives or observe workplace interactions, thus grasping how digital transformation becomes integrated into the organizational culture and practices while also aiming to fathom the perspectives and experiences of individuals involved. This qualitative phase aligns with a relativist ontology which acknowledges multiple realities and subjective experiences, suggesting that reality is socially constructed, and holds the potential to facilitate the development of hypotheses or theories (Maarouf, 2019), which may subsequently undergo testing during the subsequent quantitative phase, employing a positivist approach (Scotland, 2012; Aliyu *et al.,* 2015).

Organizational digital transformation centers on the organization as the focal point of change,

driving profound ontological shifts that challenge fundamental understandings of existence, reality, and organizational nature. This transformation emphasizes how digital technologies redefine an organization's core structures and processes, crafting a fundamentally new organizational reality that often precedes—and can even supersede—the physical world (Scotland, 2012). The ontological repositioning within ODT underscores that the organization's digital existence is conceptualized and operationalized first, with its physical counterpart emerging subsequently or, in some cases, becoming secondary. These shifts hold significant implications for the evolving roles of humans and technology within organizations and for the responsibility of research to analyze and interpret this dynamic interplay between digital and physical realms.

Adopting a holistic approach is paramount in understanding digital experiences intricately linked with multiple platforms and institutional logic. This approach enhances our understanding and instils a deep sense of responsibility and commitment in the research process. Moreover, the researcher's engagement with broader stakeholders, including key players in marketing, design, entrepreneurship, and innovation, is crucial. As we witness the rise of a techno society, the researcher's involvement in general discussions about the organization's digital transformation becomes more active.

3.2.3 Positivist Paradigm

The positivist approach assumes that key variables can be quantitatively measured and verified using rigorous scientific methodologies. (Fetters, *et al.,* 2013; Cornelissen & Werner, 2014; Maarouf, 2019). This paradigm takes an objective stance, emphasizing empirical observation and measurable phenomena. It assumes that reality exists independently of human interpretation and focuses on identifying cause-and-effect relationships between variables (Goertz & Mahoney, 2012). The researcher developed generalizable methods applicable across various contexts and emphasizes controlling

extraneous variables to ensure the reliability and validity of data.

In this study, the positivist approach adopted during the second phase, wherein a carefully crafted structural questionnaire survey is employed to identify and explore the relationships between variables. Subsequently, statistical analyses are employed to test the formulated hypotheses. In an organization's digital transformation context, the positivist approach harnesses quantitative data on causal factors associated with Yu's 3H domains, encompassing leading effectiveness, strategizing, and organizing capabilities, and technical and operational competencies.

Addressing these epistemological issues is crucial for developing a sound knowledge base and robust methodologies in this research (Maarouf, 2019). One major epistemological challenge is the dynamic nature of digital transformation. In this ever-evolving landscape, traditional research approaches can become outdated quickly. The question of whether our existing epistemological frameworks are suited to this dynamic environment is a significant consideration (Goertz & Mahoney, 2012; Aliyu *et al.,* 2015). Additionally, the holistic management framework encompasses a broad spectrum of factors, from technology and infrastructure to culture and human capital. This multidisciplinary approach raises epistemological concerns about the integration of knowledge from various fields (Don-Solomon & Eke, 2018; Maarouf, 2019). The researcher synthesizes knowledge across these diverse domains and develops holistic insights into digital transformation.

3.2.4 Constructive Paradigm

As an epistemological approach, constructivism focuses on comprehending individuals' subjective experiences and interpretations. It is characterized by the frequent utilization of qualitative research methods to delve into the perspectives and meanings attributed by participants to a phenomenon of interest (De Vaus, 2001; Rescher, 2012). Within this paradigm, the qualitative phase conducted particular significance in the exploratory

sequential design as it offers an avenue for in-depth exploration of participants' ODT experiences.

The researcher identifies the specific dimensions of construct from the qualitative phase, leading to a more comprehensive understanding of the research questions. As digital transformation unfolds, axiological concerns surface, demanding attention for a comprehensive understanding of this intricate phenomenon. Balancing technological advancement and ethical considerations is a significant axiological issue. This research navigates values underpinning data ethics and strives for equilibrium between innovation and safeguarding individual and societal interests (Rescher, 2012). Axiological considerations extend to the workforce, addressing ethical questions about job displacement and employee well-being amidst automation (Aliyu *et al.,* 2015; Maarouf, 2019).

The researcher delved into ethical values to ensure a fair transition for all affected factors. For example, in the digital age, corporate social responsibility (CSR) poses an axiological challenge. Organizations must align digital initiatives with broader ethical and societal values, understanding how CSR values drive ethical and sustainable digital transformation. Digital transformation prompts axiological questions about environmental sustainability. Organizations evaluate ethical values regarding the ecological footprint of digital transformation efforts amid technological advancements with energy consumption and environmental consequences. Axiological issues also encompass aligning organizational values with digital transformation objectives exploring how an organization's core values influence its approach to this transformative process (Baron & Hannan, 2002).

3.2.5 Research Approaches

Methodological Diversity for Comprehensive Investigation: This study employs diverse methodologies aligned with the research objectives of understanding the ODT and its related social aspects (Creswell *et al.,* 2011). The ESMM - Exploratory Sequential Mixed Method

enables the exploration of ODT's underlying structures, enhancing study credibility and validity. It incorporates interpretive and qualitative phases to delve into social and cultural contexts, which is vital for successful digital transformation. The approach encompasses positivist methods and quantitative phases. Employing a triangulation research paradigm akin to nautical measurements ensures unbiased analysis, integrating literature, focus group interviews, and surveys for comprehensive insights (Creswell *et al.,* 2007; Teddlie & Tashakkori, 2012; Punch, 2013).

This study synthesizes various theoretical perspectives to uncover the underlying factors contributing to the success and failure of ODT, drawing on relevant insights to inform the analysis. The quantitative phase employs statistical methods to test hypotheses, following Onwuegbuzie & Johnson's (2006) framework. Methodological triangulation encompasses diverse data collection techniques and inferences across various scales (Punch, 2013; De Vaus, 2001). The goal is to comprehensively understand the investigated phenomenon by merging insights from various theoretical perspectives. The research stages employed in this study can be outlined as follows:

- **Conceptual Stage:** The researcher formulates the research questions, objectives, and hypotheses during the conceptual stage, which the interpretive approach, alongside the quantitative phase to address the complexities of operational dynamics in digital transformation.

- **Methodological Stage:** The researcher crafts a structured research design blending multiple methodologies. Data triangulation combines resources like scholarly literature, focus group interviews, and questionnaire surveys, amassing data from varied viewpoints for robust research findings.

- **Experimental Stage:** Data is garnered through a structured questionnaire survey. Various theoretical perspectives are combined through multiple theory triangulation to

uncover the core of research questions. This integrated theory forms hypotheses tested via statistical methods for insightful outcomes.

- **Inferential Stage:** The researcher navigates social cultural contexts, and operational dynamics linked to digital transformation success. Methodological triangulation merges diverse approaches, boosting findings' robustness and accuracy.

Below (*Figure 12)* lies the research paradigm (ESMM), shaped by the researcher via adaptation from Onwuegbuzie & Johnson (2006), Creswell *et al.* (2007), Teddlie & Tashakkori (2012), and Punch (2013)

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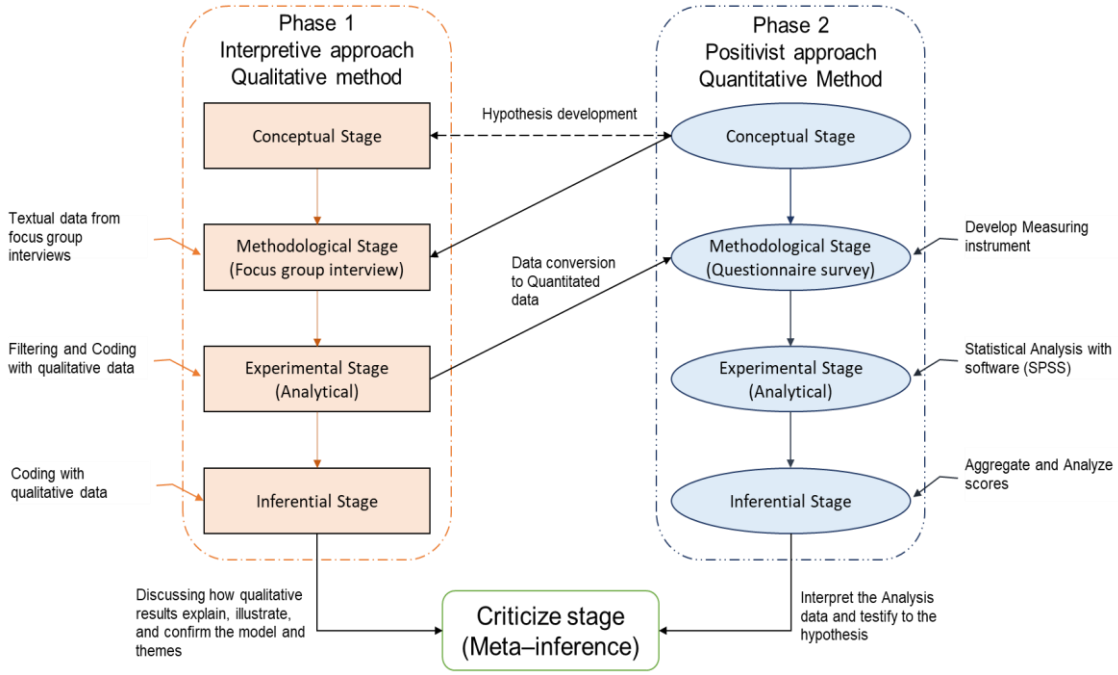

Figure 12: The paradigm of ESMM – by researcher

3.3 Conceptualization and Operationalization of the Research Design

Conceptualization and operationalization are foundational in research design and crucial for a well-structured, valid, and reliable study. The researcher emphasized the importance of comprehending ODT, such as conceptualization defines key concepts and variables precisely, aligning with existing literature and theories for a solid theoretical framework (Tashakkori & Creswell, 2007). Establishing a concrete footing, the researcher identified

ODT-related concerns, defines key concepts, conducts an exhaustive literature review to shape the theoretical framework, specifies measurable variables, deepens comprehension, and identifies gaps for exploration, culminating in hypotheses generation.

Post conceptualization, these inquiries are specific, measurable, and focused on pivotal study variables. The researcher ensured a clear investigation direction, aligning with the study's purpose and objectives. Hypothesis development is also intrinsic to conceptualization which proposed variable relationships grounded in this study's theory and aligned with research questions. These hypotheses guide systematic data testing and analysis in identifying crucial research variables is pivotal in conceptualization. This clarity settled the stage for comprehensive data collection and analysis, enhancing understanding of the investigated phenomenon (Mayoh & Onwuegbuzie, 2015).

Operationalization in this study involved translating abstract concepts and variables into practical, measurable components within the research design. This phase established reliable, valid, and contextually relevant data collection and analysis procedures essential for effectively addressing the research question (McLafferty, 2004; Creswell *et al.,* 2007, 2011; Mayoh & Onwuegbuzie, 2015). By operationalizing key constructs, this study created a structured approach for gathering data, enabling meaningful conclusions that enhance its relevance to the research field and organizational contexts alike (Podsakoff *et al.,* 2003; Tashakkori & Creswell, 2007; Mayoh & Onwuegbuzie, 2015).

Defining abstract concepts as measurable variables provides immediate research utility and promotes knowledge advancement in organizational digital transformation (Creswell *et al.,* 2007; Punch, 2013). The study's comprehensive approach to conceptualization and operationalization thus reinforces its validity, relevance, and reliability. By clearly defining variables and rigorously selecting data collection methods, a robust foundation was laid for exploring the intricacies of organizational digital transformation. This structured approach

delivers practical insights, supports best practices, and facilitates the reproducibility of findings, contributing to this research's immediate goals and broader knowledge in digital transformation and organizational studies.

3.3.1 Research Design

A research design is a structured blueprint for a study, detailing the methods and procedures required to collect and analyze data systematically (Driscoll *et al.,* 2007; Ridder, 2017). It provides a clear framework to address research questions and test hypotheses, laying out specific plans for sampling, data collection, and analysis to ensure consistent and systematic implementation (De Vaus, 2001; Punch, 2013, pp. 44-48). By defining relevant data collection techniques and analysis procedures, the research design aligned collected data with research objectives, mitigates bias, and minimizes errors throughout the process.

A well-constructed research design optimizes the efficient use of time and resources, enables replicability for future researchers, and contributes to advancing knowledge within the field of study (Cameron, 2009; Fetters *et al.,* 2013; Ridder, 2017). Critical decisions in the research design included data types, collection methods, sampling strategies, and analytical techniques, all reflecting the constructs and areas of interest being studied (De Vaus, 2001; Ridder, 2017). The researcher composed a rigorously designed study that enhanced credibility and provided a robust foundation for drawing valid conclusions, guiding inquiry, and facilitating meaningful academic contributions.

3.3.2 Factors and Constructs Definitions

This study's factors and constructs are crucial in defining and clarifying the key concepts and variables central to understanding ODT. Factors refer to specific variables that influence the success of ODT, such as the type of technology used, the transformational processes, organizational culture, leadership style, strategic choices, and human capabilities (Banker

et al., 2000). These elements are integral to understanding how organizations navigate and succeed in their digital transformation efforts.

On the other hand, constructs are the theoretical explanations the researcher has developed to define and clarify these key concepts, drawing from existing research and established theories (Attride-Stirling, 2001). This clarity strengthens the relevance and impact of the study, advancing our understanding of the critical elements that drive successful digital transformation in organizations.

3.4 Research Processes

The "Research Process" includes steps for a systematic and rigorous project, leading to accurate, reliable, and valid results (De Vaus, 2001, pp.17-33). Steps involve identifying the question, literature review, design, data collection and analysis, interpretation, and communicating findings (Creswell *et al.,* 2011). Each needs planning, detail, and ethics (Poon & Swatman, 1999; Tashakkori *et al.,* 2012; Guest, 2013). The qualitative phase uses focus group interviews to explore attitudes and develop variables and codes (Creswell *et al.,* 2007; Cameron, 2009). Variables are from descriptive codes themes into scales and quotes (Edmonds & Kennedy, 2017, pp.196-200; Tashakkori & Teddlie, 2008).

The subsequent quantitative phase involved collecting numerical data through surveys or questionnaires to identify data patterns, trends, or relationships. A constructed questionnaire based on the literature review and first-phase results is utilized to identify critical success factors of ODT correlated with the 3H framework (*Heart, Head, and Hand*) and explore participants' perspectives individually. The final stage integrated quantitative and qualitative data, allowing for comparisons or using qualitative data to explain or expand upon quantitative findings.

The pilot study, often termed a *"small-scale test"* or *"trial run,"* is paramount in social science

research. It serves as a pivotal preparatory phase for the main study (Prescott & Soeken, 1989; Van Teijlingen & Hundley, 2002), aimed at uncovering potential weaknesses, needs, and challenges within the research instruments. Mohamad *et al.* (2015) highlighted the importance of pilot tests in refining research protocols, providing the researcher self-training, and aligning sample resources with the study plan. This proactive approach diminished the possibility of project failure and the use of inappropriate or overly complex research tools (Van Teijlingen & Hundley, 2002; Tashakkori & Teddlie, 2008). The pilot aimed to validate interview questions. advised ensuring confidence in chosen research methods and instrument validity, suitability, and effectiveness before initiating a study to prevent misdirection and ambiguity in responses (Dikko, 2016). The researcher illustrates a brief view of the adopted research processes (*Figure 13*).

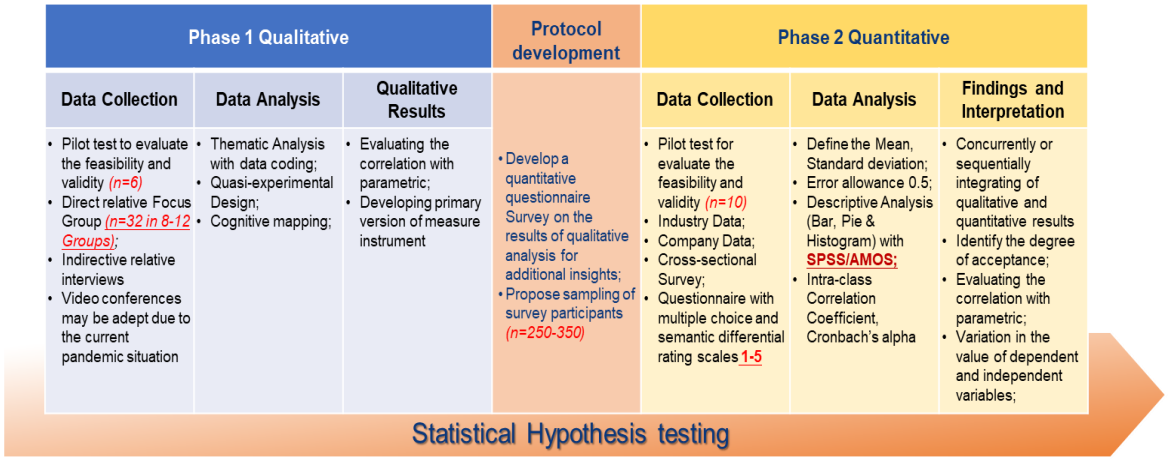

Figure 13: Brief view of the adopted research processes - by researcher

3.4.1 Phase One Qualitative Research – Focus Group Interviews

Focus group participants received personalized email invitations from the researcher, explaining the interview's purpose and introducing the 3H framework. After acceptance, they received the *'Focus Group Interview Consent Form' (Appendix 1: Signed Focus Group Consent form),* this form sought permission and outlined the interview process, roles, and responsibilities to ensure the study's legal, safe, and ethical conduct (Longhurst, 2003; McLafferty, 2004; O. Nyumba *et al.,* 2018). Due to the pandemic outbreak and the

geographical constraints of participants, the focus group interviews were conducted via video conference using Zoom. Each interview was video recorded to facilitate accurate and precise analysis during the subsequent review. The qualitative data obtained were analyzed thematically, informing the development of a comprehensive and relevant structured questionnaire for the subsequent quantitative phase, ensuring its comprehensiveness, relevance, and alignment with the research objectives. In this qualitative group interview was conducted using a semi-structured approach, incorporating nine open-ended questions. After identifying the research objectives and target population, a systematic literature review will be performed to gather relevant insights, generating pertinent interview questions. Open-ended questions allow participants to freely express their thoughts, opinions, and experiences, foster rich, detailed responses that provide valuable insights and perspectives (Creswell *et al.,* 2007; Teddlie & Tashakkori, 2009, 2012). The focus group interview offers data collection and analysis flexibility, enabling the researcher to adapt to unexpected findings and appreciate the subjective nature of human experiences. This approach values empathy and understanding of participants' perspectives, enhancing the validity of the findings through rigorous data collection and analysis methods (Carey & Smith, 1994; Rabiee, 2004; O. Nyumba *et al.,* 2018).

In response to the COVID-19 outbreak, the researcher conducted a pilot focus group interview via Zoom to assess the effectiveness of the interview structure and participant engagement. Six senior management professionals from Hong Kong-based companies (with 100+ employees and prior ODT experience) participated. Initially, the research design was intended for six participants per focus group; however, based on insights from two pilot runs, the researcher determined that a maximum of four participants per session granted improved interaction and data quality. The pilot interviews provided essential insights into transcript coding, enabling the systematic identification of patterns and themes to inform the development of the research instrument for the subsequent quantitative phase (Leech &

Onwuegbuzie, 2007, 2008; Gill *et al.,* 2008; Onwuegbuzie & Combs, 2011).

At the outset of each focus group, the researcher delivered a PowerPoint introduction outlining the research objectives, ethical considerations, and interview agenda to ensure participant clarity and engagement. As the 3H management framework was not widely recognized among all participants, a brief explanation of its Heart, Head, and Hand domains were provided. This contextual foundation ensured participants shared perspectives within a common theoretical framework, enhancing discussion coherence. The introduction also fostered transparency and credibility, encouraging candid participation. Each session was video recorded and securely stored on the researcher's password-protected computer. The interview sessions commenced with open-ended, broad questions, avoiding technical jargon to minimize misunderstandings and response bias (Morgan, 1995; Nyumba *et al.,* 2018). Hypothetical scenarios and probing questions were incorporated to explore participant attitudes and beliefs, prompting deeper reflection and concrete examples. This approach strengthened data validity and reliability for the quantitative research phase (Boddy, 2016).

For the official focus group interviews, 32 participants were invited and divided into 8 to 12 groups, comprising the researcher's business associates, counterparts, and professional contacts with whom they had maintained engagement over the past decade. The study employed convenience sampling, a cost-effective and efficient method for exploratory research, as it ensures participant availability and willingness to engage (Etikan *et al.,* 2016; Oppong, 2014; Leiner, 2014). The selected participants: business owners, C-level executives, senior management, and technology executives, played key roles in digital transformation decision-making, providing valuable insights and real-world experiences. An interview guide was developed to ensure structured discussions, outlining key topics and questions, and facilitating logical and organized dialogue throughout the sessions (McLafferty, 2004; Creswell *et al.,* 2007). These methodological refinements enhanced the study's qualitative phase's credibility, coherence, and analytical depth.

The researcher conducted a detailed analysis of data collected from focus group interviews, a critical phase in qualitative research requiring a systematic and rigorous approach (Oppong, 2014). This process began with the transcription of audio recordings, transforming spoken responses into written text to preserve the nuances and richness of participant contributions. The transcription ensured the authenticity and depth of the data were retained, capturing subtle details essential for analysis. Following transcription, the researcher familiarized data by thoroughly reading and rereading the transcripts (Ritchie & Spencer, 2002). This process allowed for a holistic understanding of the participants' expressions, enabling the researcher to appreciate the data's content and context.

The coding step involved systematically labelling data segments with specific themes. The coding scheme aligned with the study's objectives and emerged organically as patterns and connections became evident, which organized the data effectively and set the foundation for thematic analysis. The researcher identified recurring themes and patterns in participants' responses, representing meaningful clusters of ideas that contributed to a deeper understanding of the phenomenon under investigation (Attride-Stirling, 2001).

The researcher performed a manual thematic analysis to ensure a thorough examination of the data. Once themes were identified, they were interpreted to derive meaningful insights. This phase involved exploring relationships between themes, comparing findings across different focus groups, and connecting them to the overarching research question (Williams, 2016). Data triangulation was employed to enhance the credibility and validity of the findings, which involved cross-referencing focus group data with other sources, such as quantitative data or insights from literature reviews (Attride-Stirling, 2001; Williams, 2016). Finally, the researcher organized and reported the findings coherently, ensuring they were presented structured and insightfully, thereby contributing valuable perspectives to the research topic.

3.4.2 Phase Two Quantitative Research – Questionnaire Survey

In this phase, a quantitative research approach was applied through a questionnaire designed based on a systematic literature review and findings from the initial qualitative phase. The researcher aimed to identify the critical success factors in ODT which aligned with Yu's 3H framework across each of its domains: Heart (H^1), Head (H^2), and Hand (H^3), as well as the integration of these domains. Additionally, the study investigated participants' perceptions of ODT dimensions individually. This quantitative method enabled the collection of numerical data from a sample population using structured questionnaires, facilitating statistical analysis and interpretation to reveal patterns and relationships among variables (Attride-Stirling, 2001; Yong & Pearce, 2013).

The questionnaire was designed with specific questions aligned with the research objectives, incorporating closed-ended questions with preset response options to facilitate categorization and quantitative analysis. The instrument was developed based on Yu's 3H framework, providing a conceptual foundation to explore the mechanisms driving organizational digital transformation and addressing key research questions.

The researcher's contact list originally comprised 976 contacts, including some outdated or inactive entries. After a thorough review, 600 contacts were selected for survey distribution to ensure relevance and data reliability, which has been cultivated over the past 15 years. This sample selection targeted business owners, executives, and IT professionals with relevant expertise in ODT, ensuring a diverse cross-section of industry perspectives. The sample aimed to enhance representativeness and generalizability, providing a broad spectrum of insights into digital transformation practices (Reise, 2000; Bayaga, 2010).

However, reliance on the researcher's professional network introduces potential limitations. Participants may share similar professional backgrounds, industry focus, or geographic location, which could lead to sampling bias. Consequently, the findings may not be fully generalizable to broader populations, particularly those in different industries or cultural

contexts. These limitations should be considered when interpreting the study's results and assessing their applicability to wider organizational settings.

Nevertheless, this convenience sample may create potential biases in respondents' attitudes towards digital transformation, given that individuals in the researcher's network are likely to have a shared orientation towards digitalization or technology. To mitigate these concerns, a conscious effort was made to select participants from varied roles and industries. Furthermore, while the study aimed to minimize response bias by ensuring the questionnaire was clear, neutral, and accessible, the self-reported nature of the data introduces the possibility of social desirability bias. Participants may have been inclined to provide responses that align with perceived professional expectations rather than candid insights. Confidentiality and anonymity were emphasized to create a more open environment, encouraging participants to offer honest feedback without concern for judgment, thus reducing but not eliminating this limitation (Yong & Pearce, 2013).

In summary, while using a professional network afforded practical access to a knowledgeable and skilled sample population, the limitations of sample bias and potential response bias underscore the need for cautious interpretation of results when considering the broader applicability of the findings. The extensive questionnaire survey conducted using 'Google Form' and Wenjuanxing (問卷星) , which consists of 36 constructed questions and 13 descriptive questions. Participants provided their responses using a 5-point Likert scale semantic differential rating, ranging from 'strongest agree' to 'strongest disagree' (*Table: 10*).

Level	**Strongly Disagree** 強烈不同意	**Disagree** 不同意	**Neutral** 中立	**Agree** 同意	**Strongly Agree** 強烈同意
Score	1	2	3	4	5

Table 10: 5-point Likert scale semantic measure rating

Wenjuanxing (問卷星):
https://www.wjx.cn/vm/hgdVYWcb.aspx

Google Form:

https://docs.google.com/forms/d/16VuoiT7Q7rxtCnqX6R4gRDHDwP5Bl9wAtJ8d_BtnfIsY/edit?pli=1

The part one included 30 questions exploring five constructs identified from phase one focus group findings. Part two contained six questions focused on ODT performance. Part three presented five multiple-choice questions on leadership competencies, digital transformation objectives, barriers to ODT, and organizational norms for implementation. The final section consisted of eight questions on demographic information, such as gender, organization size, work history, business type, and location. This structured approach enabled the collection of diverse quantitative and qualitative data, supporting the research objectives (Table 11).

Survey Structure	Questions	Objectives
Introduction	1 – 30	Explore five constructs associated with Organizational Digital Transformation (ODT): *Organization fundamentals, People-centric, Strategy Formation, Execution Management, Competencies and Competitive Advantage.*
Part 1	31 – 36	Organization Performances from the ODT
Part 2	31 – 36	Open question for additional success/failure factors of the ODT
Part 3	A – E	Addressing topics such as organization style, leadership competency, ODT performance, barriers to ODT, and effective team collaboration
Part 4	F – M	Descriptive information about the survey respondents

Table 11: The structure of questionnaire survey and its objectives

The questionnaire was developed based on established constructs and themes identified through qualitative analysis of focus group interviews. These themes were subsequently reviewed, refined, and aligned with existing academic research surveys to ensure validity and consistency with prior studies. This dual approach ensured a robust alignment with both empirical insights and theoretical foundations, thereby enhancing the reliability and validity of the data collected. By integrating the nuanced perspectives from the qualitative analysis

with established survey methodologies, the questionnaire comprehensively addressed key dimensions of ODT. It explored critical managerial decisions and operational factors, providing a well-rounded basis for data collection to inform the development of an analytical framework.

A pilot test was conducted with a sample of ten mid-to-senior management professionals from the Greater Bay Area of China to enhance the rigor and effectiveness of the research instruments and procedures. This diverse group of participants comprised business associates, Doctor of Business Administration (DBA) classmates, and colleagues, ensuring a well-rounded assessment of the survey's applicability across different managerial perspectives. The primary purpose of the pilot test was to identify and rectify potential issues related to technical formatting, survey distribution, programming, and data collection procedures. By administering the survey in a controlled setting, the researcher could systematically evaluate key aspects such as the clarity of the questionnaire, the logical flow of questions, ease of navigation, and overall user experience. This approach allowed for the early detection of ambiguities, inconsistencies, and logistical challenges that could have otherwise affected the quality of responses or response rates. Furthermore, while the pilot test was designed to facilitate potential refinements to the questionnaire and survey administration process, it was reassuring to find that no major modifications were required. The feedback gathered from participants reinforced the survey's clarity and functionality, confirming its readiness for full-scale deployment.

Overall, the pilot test played a critical role in strengthening the data collection phase's reliability, validity, and efficiency. By proactively addressing potential methodological issues, the study was better positioned to achieve robust, high-quality results, thereby enhancing the overall credibility of the research. Demographic data from the pilot test participants is presented in *Table 12*.

Geographic		Frequency	Percent
Gender	Male	6	60%
	Female	4	40%
Age range	36-44	2	20%
	45-52	4	40%
	53-59	3	30%
	60 or older	1	10%
Years of experience	5-7 years	1	10%
	8-10 years	2	20%
	over 10 years	7	70%
Position	C-Level (CEO, COO, CFO)	5	50%
	MD, Ex-Director,	3	30%
	Unit Head	2	20%

Table 12: Demographic data of pilot test (n=10)

In addition, the researcher presents a descriptive statistical analysis of data (*Table 13*) from the pilot test surveys, with the summarized results as follows: based on the predefined dimensions, the descriptive statistics indicate that the average levels are generally moderate or above. Among them, the Mean levels of Hand, Heart, and Heart & Hand are relatively higher, while other indicators are at relatively moderate levels, which reflects that the companies have achieved a certain level of management in the corresponding areas but still have room for further improvement.

Variable	Obs	Mean	Std. dev.	Min	Max
Heart (H^1)	10	4.000	0.991	2.000	5.000
Head (H^2)	10	3.583	0.937	1.500	4.667
Hand (H^3)	10	4.220	0.485	3.200	4.800
Heart & Head (H4)	10	3.800	1.372	1.333	5.000
Heart & Hand (H3)	10	4.000	0.943	1.667	5.000
Head & Hand (H2)	10	3.067	1.522	1.333	5.000
3H integrated (H1)	10	3.050	1.707	1.000	5.000

Table 13: Descriptive statistical analysis of pilot test (n=10)

After the pilot test, 530 questionnaires were distributed via email, WhatsApp, and WeChat. An expected ≥ 45% response rate aligns with common rates in organizational research (Baruch, 1999; Boddy, 2016). Diverse participants, including business owners, executives, and IT professionals from various industries, enrich the study's representation.

The questionnaire survey is clear communication, simple questions, personalized invitations, and charity donations of HK$50 per returned survey enhance response rates and address ethics, with donation details at the survey's start. The questionnaire is translated from English to simplified and traditional Chinese formats and consistently interpreted to cater to the Chinese-speaking participants who can participate (*Appendix 1a*). The translated version is rigorously verified and refined by proficient Chinese language experts at universities. The distribution channels were through *email*, *WhatsApp*, and *WeChat* in the pilot study, and all results were transferred to an Excel file and input into SPSS for analysis.

3.5 Validity, Reliability and Triangulation

Ensuring research credibility and robustness involves examining validity, reliability, and supportive measures. Validity refers to the accuracy and truthfulness of findings, while reliability addresses their consistency over time (Attride-Stirling, 2001; Onwuegbuzie *et al.,* 2010). The researcher used a structured practice based on four main approaches to ensure the findings accurately represent digital transformation, providing a strong basis for measurement. These approaches include:

- Improving participant selection by increasing the sample size and quality.
- Enhancing measurement tools to ensure all instruments used in the research are effective.

- Maintaining treatment integrity by checking the accuracy of interventions and their outcomes.
- Strengthening data analysis to help researchers interpret the findings more effectively.

In this study, the researcher took careful, systematic steps to ensure that the methodology upheld validity, reliability, and robust standards in exploring DT impacts across business levels. To begin, the researcher thoughtfully selected a sample of business owners and operators who had direct, practical experience with DT, recognizing the value of insights drawn from those directly engaged in these transformations. This targeted sampling was essential in aligning the data with the study's objectives and elevating the findings' relevance by grounding them in participants' lived experiences.

To further strengthen reliability, the researcher employed a range of validated data collection tools, including surveys, interviews, and observational methods. The reliability measure was quantitatively assessed through Cronbach's Coefficient Alpha, where values of 0.7 or higher were considered sufficient for internal consistency. Achieving this threshold affirmed that the survey items reliably measured their intended constructs, thereby bolstering the data's robustness (Attride-Stirling, 2001; Williams, 2016). Additionally, the researcher conducted a single hierarchical regression analysis to gain insights into the effects of control variables, such as demographic factors, to understand ODT better. This approach also examined the relationships among the study's key variables within the digital transformation context. The analysis involved sequentially entering organizational, technological, and human factors into the model, enabling the researcher to evaluate each factor's unique contribution to DT outcomes while accounting for potential confounding effects.

This method provided valuable insights into how control variables, such as employee demographics, alongside core factors like technological readiness, leadership, and organizational culture, influence DT success. For instance, it helped clarify how

technological readiness might impact outcomes when considered with organizational leadership dynamics. The hierarchical regression approach offered nuanced perspectives, allowing for the identification of specific areas organizations may prioritize to enhance their DT initiatives (Jeger *et al.,* 2014; Arshad *et al.,* 2023). Triangulation was an integral component of the methodology employed to verify findings through multiple data sources and methods. Recognizing the complex, multifaceted nature of DT research, the researcher leveraged triangulation to ensure consistency across different data sources and identify any discrepancies requiring further examination. This methodological approach enriched the study's conclusions, providing added confidence in the reliability of the findings (Reise, 2000; Creswell *et al.,* 2007).

The researcher ensured internal validity through content, criterion-related, and construct validity measures. Content validity was established via a comprehensive literature review to align the survey and interview questions with key DT themes. Criterion-related validity was addressed using concurrent and predictive validity tests, comparing research data to established standards. Construct validity was confirmed through factor analysis and checks for convergent and discriminant validity. These steps enhanced the study's credibility, reliability, and validity, providing valuable insights for advancing research and practical applications in ODT.

3.6 Research Ethics and Accessibility

This study approached research ethics as a foundation of core principles and values that guide every aspect of the research process, creating a framework grounded in integrity and responsibility. Equally important was the consideration of accessibility, both as a practical necessity and an ethical imperative, providing the research remained transparent and available to relevant audiences. Together, these ethical and accessibility considerations were critical to the study, helping to prevent potential legal risks and minimize vulnerabilities

that might arise from human error (Lucas *et al.,* 2016). According to Richards and Schwartz (2022), there are several key principles and imply adherence that guide research ethics, including:

- Guiding and scrutiny by an independent ethics committee or board,
- Sufficient adequate expertise of the supervisory team,
- Adhere to the ethical guideline and principles throughout the entire research process,
- Tap into ethics resources.

In this research, comprehensive ethical protocols were followed to uphold integrity and accountability across all activities. Ethical approval was sought by submitting the PG2/E1 Form to the University of Wales Trinity Saint David's (UWTSD) research ethics committee, ensuring compliance with the OECD Frascati Manual standards.

Confidentiality and privacy were prioritized, especially given the study's focus on safeguarding participants' autonomy and dignity. Before each focus group interview, participants reviewed and signed a consent form, affirming that their participation was voluntary and granting permission for the interview to be recorded. To maintain anonymity, pseudonyms were used throughout this report. This commitment to ethical thoroughness reinforced the study's credibility and safeguarded the welfare and rights of all participants involved.

By adhering to these standards, the researcher aimed to conduct the research with the highest levels of care and accountability, reinforcing the integrity of the research process and ensuring that the findings were both credible and responsible. This study approached research ethics as a foundation of core principles and values that guide every aspect of the research process, creating a framework grounded in integrity and responsibility. The focus group interviews were conducted in English, using language that was accessible to participants. Before the interviews, participants received a PowerPoint introduction and

interview handbook to ensure they understood the study's objectives and procedures.

The second phase of the research involved a questionnaire survey, distributed via email and mobile messaging. The written introduction clarified that participation was voluntary, and responses would remain anonymous. All data was treated confidentially and used solely for research purposes, with regular password-protected backups to ensure security. Access was limited to the researcher. Upon completion of the study and six months after thesis approval, all electronic data will be deleted, and hard copies shredded, ensuring ethical standards and data security throughout the research process. All research activities of this study will be based on the following conditions and guidelines:

- Compliance with Personal Data (Privacy) Ordinance 486, Law of Hong Kong,
- All data collected must be after company/personal consent is obtained,
- A weekly backup will take place.

This study grounded its approach in research ethics, following core principles of integrity and responsibility. Ethics guided each process step, while accessibility ensured transparency and availability to relevant audiences. The researcher aimed to maintain care and accountability throughout the study by adhering to these standards; no sensitive personal data was collected, and the survey did not include questions that could trace responses back to participants. Data were securely stored on designated devices with password protection and accessible only to the researcher.

3.7 Chapter Three Summary

This chapter provides a detailed overview of the research methodology employed in this study. It begins by outlining the research problem and framing the research questions. The methodology section follows, describing key components such as the research design, data collection methods, procedures for data analysis, and the steps taken to ensure the integrity

and reliability of the data. The study adopted a mixed-methods approach, integrating quantitative and qualitative research paradigms. Specifically, an exploratory sequential mixed methods design is utilized, with an initial qualitative phase focused on focus group interviews, followed by a quantitative phase based on survey questionnaires. Each research phase was thoroughly explained, detailing the sampling strategies, data collection techniques, pilot testing procedures, and the analytical methods used to interpret the data. Semi-structured interviews conducted during this phase provide valuable insights into participants' perceptions and experiences, addressing key aspects of ODT, such as the *"Why," "How," "Who," "Where,"* and "*What."* These interviews help uncover the underlying dynamics of transformation.

The subsequent quantitative phase tested these identified factors on a larger scale, offering empirical evidence to validate the findings. This phase examines relationships between variables, the significance of the H domains, and the broader implications of ODT, contributing to a comprehensive managerial framework. The strength of the mixed-methods approach lies in its ability to reduce variability and bias, merging qualitative insights with quantitative data to ensure more robust and reliable results (Edmonds & Kennedy, 2016, pp. 125-131). This chapter summarized strategies to ensure data integrity and reliability, detailed the exploratory mixed-methods approach, and highlighted ethical considerations in studying organizational digital transformation.

CHAPTER FOUR – QUALITATIVE ANALYSIS

4.1 Introduction

This chapter offers a comprehensive guide for analyzing data from Focus Group (FG). These semi-structured interviews involved 32 participants, capturing intricate business experiences and social interactions within digital transformation. The chapter underscores documenting the research process, acknowledging the researcher's role in shaping data analysis, and emphasizing reflexivity and transparency. Gill *et al.* (2008) stated that the subjectivity of participants' views necessitating an objective exploration supported by extensive literature. The researcher outlines steps in analyzing focus group data, including transcription, theme identification, coding, and interpretation.

4.2 Qualitative Research Implementation

Conducting the research focus groups with 32 busy business executives posed challenges. Due to COVID, the researcher managed 11 groups of up to four participants via Zoom conference. Preparations included sharing interview guides and consent forms and confirming participation. Interviews lasted approximately 100 minutes, balancing participant input and focus. Ensuring topic alignment, participant comfort, and engagement were prioritized. The extensive research activity took over four and a half months.

4.2.1 Interview Sampling and Protocol

This research employed a convenient sampling method involving 32 participants drawn from the researcher's personal contacts, including business owners, executives, senior management, and unit heads. Over 50 individuals were selected through affiliations, friends, social connections, partners, and referrals—personalized invitations via phone calls, messaging or emails and introductions to the research purpose. This non-probability sampling approach hinges on factors like background, knowledge, accessibility, and availability rather than random selection (De Vaus, 2001; Boddy, 2016). While offering

efficiency in recruitment, it may exhibit limitations in representativeness and potential selection bias. The researcher adopted a multi-pronged sampling strategy to overcome recruitment challenges, primarily utilizing convenience sampling supplemented by referral-based recruitment and targeted outreach through social media platforms. Notably, eleven participants were recruited via referrals from professional business affiliates. A clearly defined set of selection criteria—encompassing relevant qualifications, individual characteristics, demographic attributes, cultural background, and industry representation—was employed to enhance the representativeness of the sample and strengthen the reliability and validity of the research outcomes (Leech & Onwuegbuzie, 2007).

After participants confirmed and signed back the consent form, the researcher emailed all participants of the discussion schedule with the Zoom call information. The research activities conducted in English, and as per previous paragraph stated that the researcher provided a focus group discussion guide before the research activity. In the beginning of the activity, the researcher introduced the 3H management framework which conceptualizes *Heart, Head, Hand* and *Integrate H* domains for organization's digital transformation. This 16 pages PowerPoint introduction of the 3H conceptual management framework and focus group questions are at (*Appendix 2).*

4.2.2 Participants Profile

Participants are among 16 different industries globally and businesses in ten different regions. In terms of their organizational culture, 26 of participants are Chinese background (81.3%), 2 from European (6.3%), and Japen, Singapore, Vietnam, and USA have one each (3.1% each). Below *Table (14 & 21)* are summaries of the participants' industries' background and company origins.

The study sample comprises 32 participants, of whom 19 are male (59%) and 13 are female (41%), with an average age of 49.6 years. The age distribution shows that the majority of

participants (50%) fall within the 45–52 age range. All participants have undergone an ODT journey, contributing valuable insights into their varied experiences with digital adaptation. In terms of career tenure, ten participants (31.3%) have between 11 and 20 years of experience, 18 (56.3%) have between 21 and 30 years, three (9.4%) span 31–40 years, and one participant (3.1%) has over 40 years of experience. This distribution provides a diverse range of career stages for analysis within the context of digital transformation success and challenges.

Accounting	1	Hospitality	1	Engineering	2	Manufacturing	1
Aviation	1	HR	2	Entertainment	2	Marketing	1
Consulting	1	Insurance	2	F&B	2	Real-estate	2
Education	2	Legal	1	Financial	7	Technology	4

Table 14: Participants' Industries Background (n=32)

Hong Kong	17	China	3	Singapore	3	USA	2	Canada	2
German	1	Australia	1	Japan	1	Vietnam	1	Korea	1

Table 15: Participants' Company originated (n=32)

Among the 32 participants, 18 (56.2%) reported successfully achieving the primary ODT targets established by their organizations, completing the transformation journey with measurable success. These individuals demonstrated effective integration of digital solutions and the successful implementation of transformation initiatives within their designated project scopes. However, it's noteworthy that some participants experienced multiple episodes of digital transformation with varying outcomes. Specifically, 9 participants (28.1%) indicated that their digital transformation initiatives remained incomplete due to various reasons, such as resource constraints, strategic misalignment, or unforeseen organizational challenges. Additionally, 5 participants reported that while they had initially completed their ODT journey, the transformation was not sustained over time, leading to obsolescence or reversal of digital progress. This suggests that even when an ODT initiative reaches its intended completion, maintaining its relevance and ensuring long-term impact

remains a significant challenge. For instance, while some participants succeeded in meeting specific ODT objectives—such as project launch or target milestones, they encountered challenges in sustaining these transformations over time. These insights highlight the iterative and often unpredictable nature of digital transformation, emphasizing the need for continuous adaptation, reinforcement strategies, and long-term commitment to digital integration within organizations.

Consequently, 14 participants (43.8%) reported unsuccessful outcomes in at least one aspect of their digital transformation efforts, reflecting partial or intermittent failures. This subset includes cases where participants initially met ODT targets but faced barriers in maintaining continuous digital operations, leading to overall failure in the extended ODT journey. This mixed success-failure dynamic within individuals highlights the complexity and multifaceted nature of ODT processes across different organizational contexts.

The researcher highlights full-time employees (FTEs) as a critical metric for evaluating organizational capacity and resource availability in this study. FTEs are fundamental to maintaining daily operations and supporting overall business success (Presser *et al.,* 2004; Baruch & Holtom, 2008). This metric also indicates revenue potential, growth trajectories, and competitive advantage within organizations. The distribution of participants by FTEs is as follows:

- 1 – 100 FTEs: 6 participants
- 101 – 500 FTEs: 5 participants
- 501 – 1,000 FTEs: 5 participants
- 1,001 – 5,000 FTEs: 8 participants
- 5,001 – 10,000 FTEs: 2 participants
- More than 10,000 FTEs: 6 participants

This diverse range in organizational FTE size reflects varying operational capacity and resource allocation levels, which have significant implications for each organization’s growth

potential and competitive positioning within their respective industries. In terms of positions, 16 are C-Suite Executives (50%); Middle management comprises 9 participants (28%). The remaining 7 represent functional business units, such as Supervisors, Office, Sales, and IT Managers (22%). Below (*Table 16-21*) are the summaries of the participants' profiles of the focus group.

Gender *(n=32)*		
Male	19	59%
Female	13	41%

Table 16: Participants' Gender (n=32)

ODT Experience *(n=32)*		
Success	18	56.2%
Failure	14	43.8%

Table 19: Participants' ODT result (n=32)

Age *(n=32)*		
Years	Participants	%
36 – 44	6	18.8%
45 – 52	16	50.0%
53 – 59	8	25.0%
60 or older	2	6.3%
Average age of interviewee	49.6 Years old	

Table 17: Participants' Age (n=32)

Years of Service *(n=32)*		
Years	Participants	%
5-7	7	22%
8-10	8	25%
over 10	16	50%
Retire	1	3%

Table 18: Participants' years of experiences (n=32)

Years of Career *(n=32)*		
Years	Participants	%
11-20	10	31.3%
21-30	18	56.3%
31-40	3	9.4%
over 40	1	3.1%

Table 20: Participants' Company History (n=32)

Position *(n=32)*		
Position	Participants	%
C-Suite (CEO, CFO, COO)	16	50%
Middle Management (MD, GM, RM)	9	28%
Functional Business Units	7	22%

Table 21: Participants' Position (n=32)

4.2.3 Open-ended Question Design

Employing open-ended questions (OEQ) in social science research is a common practice that enables participants to provide detailed responses. This approach fosters

comprehensive insights. In group interviews, OEQ encourages discourse and idea exchange among participants (Gill *et al.,* 2008). Open-ended questions offer an unconstrained format, prompting extensive and detailed responses from interviewees. Unlike closed-ended questions that limit answers, open-ended queries allow participants to express their thoughts and experiences freely. This unique feature enables a deep understanding of participants' beliefs, perspectives, and experiences, capturing intricate nuances (Rabiee, 2004). This study employed open-ended questions in focus group interviews to elicit in-depth, nuanced responses and stimulate dynamic discussions among participants. This methodological approach allowed the researcher to gather detailed insights, explore diverse perspectives, and foster greater participant engagement, consistent with best practices in qualitative data collection. The flexibility of open-ended questions provided a richer and more comprehensive data set than structured questions alone could yield. However, they generated varied responses that required skilled moderation to maintain focus. The collaborative nature of the approach encouraged participants to build upon one another's ideas, which reduced potential researcher bias and facilitated a thorough, multifaceted exploration of the research topic (Gill *et al.,* 2008).

The open-ended questions in this research created a flexible and unrestricted environment where participants could freely express their perspectives, ensuring that the researcher's assumptions did not confine the exploration. This design enabled the emergence of diverse viewpoints, leading to a more authentic and nuanced understanding of participants' experiences with ODT. The researcher could capture the depth and complexity of real-world digital transformation journeys by allowing individuals to articulate their thoughts organically. Given the varied expertise of the focus group participants across multiple industries, the interview questions were strategically crafted to examine how their distinct work environments influenced their approaches to ODT. This thoughtful design helped the researcher gain deeper insights into the practical application of ODT, shedding light on

common challenges, effective strategies, and measurable outcomes across different organizational settings.

Through candid and reflective responses, participants provided valuable firsthand accounts that enriched the study with real-world evidence. These insights helped identify recurring patterns and industry-specific nuances and contributed to refining the research framework. The following sections outline the foundational criteria for the focus group interview questions, with a summary of the objectives provided in *Table 22*.

Stage	Question	Objectives
Start-up broad question	1) How important of ODT for today's business environment?	Wide range of views, insights, and beliefs based on past experiences, industries, working level, and knowledge
Follow-up	2) Based on your experiences, any disappointment and satisfaction of an ODT. 3) Based on your experiences, tell me about the key challenges of ODT. 4) Based on your experiences and views, what are the key success factors (KSF) of an ODT.	Focus on specific areas of organization's digital transformation
Hypothetical scenarios	5) What does the leadership need to achieve ODT success? (e.g., leader style, capabilities, etc.) 6) What are the organization's key objectives and goals want to accomplish from ODT? 7) What competencies should require for the working team?	Aim to get their insights which imagine themselves in that situation
Discussion section	8) How would you improve an ODT? 9) What are the most significant elements we have discussed today? (Open question)	By reconfirming the suggestions to contextualize the findings

Table 22: The objectives of the Focus Group questions.

The focus group interview process comprised in four essential stages:

- **Initiating with a Sweeping Query:** The research began with a broad question that

established the framework for inquiry. This stage involved examining existing phenomena to identify trends, theories, and gaps (McLafferty, 2004). For example, posing the question, *"How important is ODT in today's business environment?"* facilitated an initial exploration that guided the focus of subsequent research.

- **Experiential Exploration for Depth:** This phase emphasized direct engagement with empirical data to validate or challenge existing assumptions. By guiding interviewees to reflect on their past experiences, researchers encouraged them to project their roles within these experiences onto future scenarios, delving into their thoughts, emotions, and actions (Rabiee, 2004; Nyumba *et al.,* 2018). For instance, the question shifted to *"Based on your experiences and views, what are the key success factors of an ODT?"* which sought nuanced insights that theoretical reviews might not have revealed.

- **Hypothetical Scenarios:** Testing hypothetical scenarios was critical for evaluating potential outcomes. This step involved constructing models or simulations based on collected data to examine "what-if" situations (McLafferty, 2004). An example included the question, *"What competencies should be required for the working team?"* allowing the researcher to assess the robustness and implications of the findings.

- **Discussion Section:** The discussion integrated and enabled participants to share and collectively build upon open-ended queries, facilitating data pattern identification across multiple individuals or groups (McLafferty, 2004; O. Nyumba *et al.,* 2018). For instance, a discussion analyzed the question, *"How would you improve an ODT?"* which aligned with current theories and aimed to elicit diverse responses. This stage probed the multifaceted dimensions of ODT grounded in participants' knowledge and experiences while proposing directions for future research on sustainable practices.

During the study, the discussions began with broad exploratory questions to establish context before delving into participants' firsthand experiences, challenges, and success

factors. Hypothetical scenarios were used to assess competencies and strategic approaches, allowing participants to evaluate potential outcomes. The final discussions enabled collaborative knowledge-building, where diverse perspectives were integrated to identify common patterns and themes. This structured approach provided valuable empirical insights, ensuring a deeper understanding of ODT practices and informing future research on sustainable transformation strategies.

4.3 Thematic Analysis

The exploratory sequential mixed methods research design incorporates a range of analytical techniques to ensure comprehensive data analysis. This framework analysed qualitative data using content, thematic, and narrative analysis (Leech & Onwuegbuzie, 2007, 2008; William, 2016). The initial phase emphasized thematic analysis to identify recurring patterns and themes within focus group interview data. This approach provided valuable insights into participants' experiences, perspectives, and attitudes, thereby deepening the understanding of their viewpoints (Attride-Stirling, 2001; Steelman *et al.,* 2004). Due to the complexities inherent in organizational digital transformation and the diverse sample of 32 business executives and senior management, a systematic analytic process was necessary. The researcher applied thematic analysis to the qualitative data collected from focus group interviews by following a systematic six-step process, which involved:

- **Familiarization with the data:**

The researcher thoroughly immersed the raw data to gain a comprehensive understanding, carefully analyzing both the planned interview questions and the collected information. This stage aimed to align the research inquiries with the structured interview framework, ensuring the data addressed the study's objectives. Initial impressions were noted during this process, revealing emerging patterns in executive perspectives on digital transformation. These

patterns included common challenges, shared experiences, and divergent viewpoints across different industry sectors.

To capture the subtleties of the data, the researcher also reviewed the audio recordings of the interviews. This step allowed for identifying nuances not fully conveyed in the transcripts, such as variations in tone, emphasis, and non-verbal cues—*like hesitations or enthusiasm*—which provided more profound insight into the participants' attitudes and responses. This detailed familiarization phase was essential for identifying key areas of interest and laying the groundwork for subsequent coding and thematic analysis.

- **Transcription:**

In the thematic analysis phase, the focus group interview's audio recording, including participants' responses and non-verbal cues, is transcribed (Attride-Stirling, 2001). The researcher iteratively reviews the transcription, annotating key phrases and conducting preliminary data coding to identify initial themes in the organizational digital transformation management framework. The transcript captured the flow of the discussion, documenting the perspectives and experiences of each participant. In which serve as the raw data for thematic analysis, where the researcher would code key statements (e.g., *"resistance to change," "leadership buy-in," "Impact on Organizational Learning"*) and identify recurring themes for a deeper understanding of digital transformation dynamics in organizations.

- **Coding:**

In the data coding stage, segments within the transcript are systematically identified and labelled based on pre-established themes or concepts. The researcher, after thoroughly familiarizing themselves with the focus group transcripts, began the initial coding process. Each transcript was read again, and the researcher systematically highlighted and annotated segments of the text that reflected recurring concepts, experiences, or significant

points. During this stage, some of the initial codes generated included:

"Resistance to Change" – Highlighted when participants discussed employee reluctance to adopt new technologies, hesitance to shift workflows, or negative reactions to digital tools.

Example from transcript: "Many employees are skeptical about moving away from our traditional systems. They are comfortable with what they know, and there's a lot of pushbacks."

- **Theme development:**

That involves grouping the initial coded into broader themes and then refining those themes to ensure they accurately represent the data. These emerging themes need precise and descriptive language that captures the essence of the research question's dataset (Richards & Richards, 2002). After generating initial codes such as *"Resistance to Change,"* the researcher began identifying potential themes by looking for patterns and relationships between these codes. The goal was to move from specific codes to broader, overarching themes that capture significant aspects of the research data. The researcher noticed that many of the initial codes clustered around common topics, leading to the development of potential themes, such as *"Strategic Alignment and Leadership's Role in Digital Transformation"* and *"Positive Outcomes and Benefits of ODT".*

- **Review and refinement:**

The researcher reviewed and refined the themes to ensure that they are grounded in the data, accurately representing the participants' experiences and perspectives, and identify sub-themes or variations within the themes if necessary. By reviewing and refining these themes, the researcher ensured that the final thematic framework was robust, comprehensive, and accurately represented the data collected from the focus group interviews (Attride-Stirling, 2001).

- **Interpretation:**

The final step of thematic analysis, where the researcher synthesized the refined themes into a coherent narrative that addresses the research question and presents the findings. In the following, synthesize the themes to develop a coherent narrative story to explain the main findings of the analysis and how they relate to the research questions. This report includes detailed descriptions of each theme, supporting evidence from the data, and a discussion of the implications, limitations, and potential future research directions. Here, the interpretation provided a detailed explanation of each theme that emerged from the thematic analysis, backed by direct quotes and examples from the data such as:

'Strategic Alignment and Leadership's Role in Digital Transformation': This section explores the sub-themes of "Strategic Leadership" and "Resource Allocation," demonstrating how effective leadership influences digital transformation outcomes:

"The CEO's endorsement was crucial. Without top-level support, there's always hesitation at the operational level." (Group A No.2 participant)

"Budget constraints limited our initial technology investments, delaying the implementation." (Group E No.1 participant)

4.3.1 Views and Opinions of the Semi-structured Questions

After the brief introduction of the guidelines of a focus group interview and 3H conceptual management framework, the first open-ended question aims to obtain a wide range of insights about the importance of ODT in today's business environment.

1) How important is ODT for today's business environment?

In response to this query, it was found that a substantial majority of interviewees, constituting 90.6%, emphasized the imperativeness of digital transformation in contemporary fast-paced

and fiercely competitive business landscapes. Their consensus underscored DT's transition from a mere luxury option to an organizational necessity, indispensable for maintaining a competitive edge. A significant portion of participants, comprising 81.2%, expounded on the potential of DT to reshape businesses by integrating digital technologies across internal operations and external engagements.

They suggested that this comprehensive integration fosters innovative business models and revenue streams, enhancing competitiveness. Moreover, 71.8% of respondents saw ODT as a guide for investments, a view held firmly by 23 interviewees. In the Business-to-Consumer (B2C) sector, 65.6% highlighted customer experience as a catalyst for market penetration, underscoring DT as vital for any organizational venture. Operational streamlining was also emphasized, with 75% of interviewees confirming that utilizing organizational data and technology enhances efficiency and decision-making agility. On a global scale, 56.3% endorsed ODT as a transformative avenue for skillfully managing change amidst globalizations. Refer to (*Appendix 3)* of the participants' response example of the question one.

The information confirmed ODT's vital role in modern business, driving competitive advantage through seamless technology integration. Novel business models and revenue streams fuel organizational growth, aligning with consumer demand, data orientation, and experiential priorities, presenting a new avenue for investment. Five discernible themes and patterns emerge from the focus group discussions, encapsulating the essence of an ODT in today's business landscape. The first theme highlighted the growth and expansion, fueled by amplified market penetration, robust value propositions, competitive prowess, and innovative business models and investments. Profitability remains a focal point within this context. The second theme accentuates agility and adaptability, which are critical amid evolving business landscapes. Central facets include:

- Enhancing responsiveness to market shifts.
- Ensuring sustainable growth.
- Realigning with digital initiatives.
- Capitalizing on global prospects.

The third theme accentuates collaborative innovation and digital competence cultivation within the organization. Business partnerships, knowledge dissemination, collective issue resolution, data-centricity, and operational enhancements converge, fostering a vibrant digital culture conducive to innovation and transformation. The fourth theme revolves around transformational excellence and efficiency. Strategic acumen steers the digital transformation journey, complemented by adept change management, technical proficiency, cognitive navigation, and systematic measurement and refinement mechanisms. Lastly, operational efficiency and data-driven decision-making synergistically contribute to the success of ODT. These themes collectively accentuate ODT's centrality in navigating contemporary business dynamics. Below *(Table 23)* shows the most important critical keywords and themes.

Q1	Theme	Coding and Pattern
1	Business Growth and Market Expansion	• Increase market penetration. • Business value proposition • Competitive advantage • New business model & investment • Profitability
2	Agility and Adaptability	• Improve agility. • Sustainable growth • Organization restructuring • Globalization
3	Collaborative Innovation and Digital Capabilities	• Business collaboration • Data-driven model • Improve operational processing. • Organization's digital culture
4	Transformational Excellence and Efficiency	• Strategic thinking • Change management • Digital technical expertise • Cognitive processing • Measuring & monitoring in place • Operational efficiency and decision-making
5	Operational Efficiency and Data-Driven Decision Making	• Data Management & Visualization • Predictive Analytics • KPIs & Metrics • Decision Support System • Security and Compliance • Feedback Loop

Table 23: The Critical Keywords and Themes of the question One

2) Based on your experiences, any disappointment and satisfaction of an ODT.

The researcher delves into anticipated outcomes of organizational digital transformation by examining satisfaction and disappointment among participants. All 32 participants (100%) acknowledged the prevalent buzz surrounding digital transformation in business, recognizing both challenges and potential. Regarding satisfaction, 30 participants (93.7%) emphasized ODT's ability to meet customer service expectations—implementation of DT streamlined operations for 27 participants (84.3%) fostering productivity. Enhanced digital culture, structure, employee engagement, flexibility, and scalability resonated with 28 participants (87.5%). Moreover, 25 respondents (78.1%) viewed ODT as a gateway to new business prospects and revenue streams. Twenty-four participants (75%) supported a purpose-driven mission, while 22 (68.8%) highlighted the value of artificial intelligence and machine learning for task automation and informed decision-making.

In terms of disappointment, unanimous consensus (100%) revealed the absence of a well-

planned digital strategy at ODT's outset, characterizing the process as '*mending bridges and repairing roads*.' Adapting to ODT-induced disruption, evoking employee resistance for 30 participants (93.8%), including challenges of new skills acquisition and technology selection. Internal skepticism, fears of workforce replacement, and pace slowdown were flagged by 29 (90.6%). The absence of top management support, transformative expertise, and digital budget constraints hindered ODT for 28 participants (87.5%). Twenty-five respondents emphasized post-transformation continuity and data governance issues, while communication gaps and the expected values were raised by 20 (62.5%). Refer to (*Appendix 4)* of the participants' response example of question two. Based on the drawing from participants' responses to question two, which illuminates common contentment and frustrations that organizations encounter amid their digital transformation odysseys. Recurrent stumbling blocks include:

- Ambiguous digital transformation strategies.
- Employee resistance to change & Inadequate expertise.
- Data quality concerns & Governance issues.
- Erroneous technology selections.

Cost-ROI misalignment emerges as a predominant factor contributing to ODT disappointment, while sources of satisfaction are linked to improvements in efficiency, productivity, enhanced customer experiences, adaptive agility, and the ability to meet evolving demands. From the participants' perspectives, two overarching themes encapsulate the patterns of satisfaction and disappointment.

The Satisfaction (S1) theme highlights positive outcomes of ODT, such as heightened operational efficiency, increased revenue generation, enriched customer engagement, and enhanced organizational scalability. The S2 theme identifies key enablers of success, including active employee engagement, seamless integration of a digital-first culture, and

alignment with a mission-driven transformation strategy. Together, these themes foster an environment conducive to successful digital transformation.

In contrast, the Disappointment (D1) theme, categorized as Organizational Fundamental Challenges, underscores barriers encountered in the transformation journey. These include insufficient transformational expertise, employee resistance, suboptimal technology selection, budgetary constraints, data quality and cybersecurity concerns. The D2 theme, Underestimation of Change Management, sheds light on challenges stemming from deficient top management support, vague strategic direction, cost-ROI discord, inadequate workforce preparedness, and ineffective change management practices. These issues collectively undermine ODT initiatives' success, leading to stakeholder disillusionment.

The researcher synthesizes the most critical satisfaction (S1 & S2) and disappointment (D1 & D2) keywords into thematic patterns derived from focus group discussions, offering a comprehensive framework to analyze ODT outcomes. *(Table: 24)*. By analyzing both satisfaction and disappointment themes, the researcher can better understand what drives success and what impedes progress, leading to more informed decision-making in ODT initiatives.

2) Based on your experiences, any disappointment and satisfaction of an ODT.		
Q2	**Theme**	**Coding and Pattern**
S1	Positive Outcomes and Benefits	• Improved efficiency & productivity • Increase revenue stream • Enhanced consumer experiences • Meeting demands • Greater flexibility and scalability
S2	Enablers of Success	• Employees engagement • Organizational digital culture • Clear purpose-driven mission • Holistic support • Effective digital strategy
D1	Organizational Fundamental Challenges	• Lack of DT expertise • Employees' resistance to change • Wrong technology selection • Poor cost and return on investment (ROI) • Expectations unmet or underachieved
D2	Underestimation of Change Management	• Ineffective change management • Stalls progress and requires corrective action. • Unclear digital strategy • Inadequate budgeting for ODT • Insufficient employee training and readiness

Table 24: The Critical Keywords and Themes of the question Two

3) Based on your experiences, tell me about the key challenges of ODT.

The researcher's objective is to directly glean insights from participants' experiences, facilitating a nuanced understanding of common challenges encountered by organizations during their digital transformation. This inquiry also serves to uncover participants' perspectives on potential challenges within Digital Transformation, pinpointing areas necessitating augmented support or resources. Remarkably, unanimous concern (100%) revolves around budgetary limitations impeding digital transformation within organizations, coupled with apprehensions over legacy system implications for ODT. A consensus among thirty participants (93.7%) highlighted the critical role of capable digital leadership in propelling Digital Transformation Strategy (DTS) from conceptualization to execution. Moreover, twenty-seven participants (84.4%) postulate that emerging technology challenges could induce IT skills scarcity across various technological functions.

Interestingly, twenty-seven respondents (84.4%) highlighted the disruptive potential of

ambiguous digital strategies, subpar communication, inadequate project management, and lack of cross-level collaboration. Reflecting on implementation intricacies, twenty-six participants (81.2%) contend that a succession plan for sustained performance management following technology integration is a critical oversight. Simultaneously, 24 participants (75%) noted the need for robust measurement and tracking systems in managing digital transformation projects effectively. Amid the digital metamorphosis, twenty-four respondents (75%) advocate for increased digital talent and enhanced training and development programs tailored to mirror the implementation process. The transformational dynamism encounters internal resistance and a limited organizational culture of digital innovation and experimentation, as twenty-two participants (68.8%) concur. Conversely, the complexities of technology lead twenty-two participants (68.8%) to ponder an imperfect alignment between digital transformation and business objectives.

In a regulatory context, only nineteen participants (59.4%) voiced concerns about compliance and unforeseen legal challenges during the transformation process. Moreover, seventeen participants (53.1%) assert the need for amplified access to external expertise, digital tools, and resources, while eighteen participants (56.2%) stress the importance of cyber security awareness amidst the global landscape. The subsequent statements emanate from the engineering, accounting, and senior financial advisory realms. Refer to (*Appendix 5*) of the participants' response example of question three.

Among the focus groups, professionals from diverse sectors identified challenges in organizational digital transformation, including budget allocation, integrating new technologies, aligning legacy infrastructure, inadequate digital skills, and issues with planning, prioritization, and vendor management. Organizations must be agile and adaptable to succeed, addressing both technological and organizational aspects. The researcher succinctly summarizes these challenges, reflecting insights from focus group participants *(Table 25)*.

These challenges fall into the *Heart, Head*, and *Hand* domains. Theme one focuses on organizational culture and leadership, encouraging innovation and change management. Theme two involves strategic planning, addressing budget limitations, legacy systems, and regulatory compliance. Theme three highlights' skills and resources requiring digital talent development, performance monitoring, and ongoing management for successful transformation.

3) Based on your experiences, tell me about the key challenges of ODT.		
Q3	Theme	Coding and Pattern
1	• Organizational Digital Culture • Digital Transformation Leadership	• Organizational digital culture • Digital leadership to drive transformation • Top management support • Internal resistance
2	• Budgeting and Track Controlling (BSC) • Digital Infrastructure • Cybersecurity & Risk Management	• Budget concerns and constraints • Complex technology challenges • Regulatory compliance and legal issues • Continuous performance management
3	• Human Resources Management • Digital Strategy Development • Legacy System Modification	• Digital talents and training • Measurement and tracking system • Digital transformation strategy (DTS) • Legacy system and infrastructure

Table 25: The Critical Keywords and Themes of the question Three

4) Based on your experiences and views, what are the key success factors (KSF) of an ODT?

The first three questions involved all participants before the researcher initiated in-depth group discussions. These questions aimed to understand the Key Success Factors (KSFs) in digital transformation as those with experience in such initiatives perceived. The objective was to identify critical success factors, including leadership support, talent, customer-centricity, agile methodologies, data-driven decisions, and technology infrastructure. This exploration considered diverse perspectives and experiences, covering challenges, achievements, impacts, opportunities, and risks associated with ODT.

Concerning digital transformation's KSFs, every participant (100%) recognized the importance of well-structured financial support, and a vision aligned with broader business objectives for successful digital transformation. The significance of decisive leadership and committed sponsorship for propelling ODT was emphasized by 93.8% of respondents. Similarly, the importance of a robust technology infrastructure to support digital initiatives was confirmed by 90.6%. The effectiveness of an agile mindset, facilitating adaptability to market changes and customer demands, was endorsed by 90.6% of participants.

Customer-centricity was a key focus for 90.6% of respondents, while effective communication and collaboration across organizational levels were crucial for 87.5%. The importance of having the right talent and skills as the foundation for successful ODT was acknowledged by 87.5%. An innovation-centric digital culture was deemed pivotal by 84.3%, as was the value of robust technology infrastructure, although it found less endorsement from C-suite executives. Change management's alignment with organizational culture, processes, and personnel was underlined by 84.3%, and process optimization to streamline operations and enhance digital transformation efficiency garnered 81.3%. Additionally, 81.3% stressed the importance of clear metrics and Key Performance Indicators (KPIs) for monitoring and adjusting progress.

Scalable initiatives and learning from experimentation garnered 78.1% support. Embracing emerging technologies, robust data analytics skills, and agile project management were vital for the same percentage. Cybersecurity's importance in safeguarding assets and data was recognized by 62.5%, while 59.3% emphasized strong vendor and supplier management. Participants also mentioned user-friendly interfaces, AI adoption, cloud computing, and digital marketing as crucial (under 30%). The following examples highlight participants' suggestions and comments based on their backgrounds and perspectives. Refer to (*Appendix 6*) of the participants' response example of the question four.

These results offer detailed insights, including suggestions and comments on potential success factors for organizational digital transformation which cover various dimensions. These themes encapsulate the key success factors (KSF) for ODT. Theme 1 underlines strategic alignment and leadership, including a clear vision, financial support, and leadership commitment. Theme 2 focuses on agility, effective communication, talent management, and fostering a digital culture. Theme 3 stresses technological infrastructure, change management, and process optimization. Theme 4 highlights measurement, innovation, risk management, and vendor relationships. The final theme centres on execution and project management, including building digital capabilities. (*Table 26*) summarizes the suggested success factors for ODT and their underlying themes from focus group participants.

4) Based on your experiences and views, what are the key success factors (KSF) of an ODT?		
Q4	Theme	Coding and Pattern
1	• Organization Digital Culture • Budgeting and Track Controlling • Digital Transformation Leadership	• Clear vision and digital strategy • Well-planned financial support • Strong leadership and top management commitment • Clear metrics measurement
2	• Agile Execution & Program Management • Change Management & Communication • Human Resources Management	• Agile and flexible approach • Effective communication • Talent management • Effective project management
3	• Digital Infrastructure and Capabilities • Process Automation & Optimization	• IT and technological infrastructure • Change management • Robust process optimization and procedures • Vendor and supplier management
4	• Innovation & Creative • Cybersecurity & Risk Management • Process Management	• Embrace emerging technologies • Digital risk management • Digital capabilities

Table 26: The Critical Keywords and Themes of the question Four

5) What does leadership need to achieve ODT success? (e.g., leader style, capabilities, etc.)

Question five delves into leadership attributes and actions critical for successful digital

transformation. It investigates leadership's role in overcoming challenges and driving digital initiatives. The insights gleaned can inform effective strategies and practices, aiding organizations in achieving their digital transformation goals.

Results show unanimous agreement (100%) on the central role of effective leadership in digital transformation. Participants (93.7%) emphasized leadership's responsibility in aligning culture and vision and allocating resources. They highlighted leadership's role in crafting transformation strategies, promoting a digital culture, and fostering adaptability to market dynamics (90.6%). Furthermore, 87.5% of participants emphasized leadership's visionary role in inspiring innovation and experimentation. Effective leadership involves offering personalized support and development opportunities to cultivate employee skills and foster continuous improvement. Leadership's agility and adaptability are crucial for responding to market changes and promoting innovation. These leadership qualities align with a transformational leadership style characterized by visionary guidance, empowerment, collaboration, customer-centricity, and a culture of experimentation.

Additionally, 68.8% of participants advocated leadership to set clear expectations and incentivize high performance through bonuses, promotions, or rewards. They emphasized the importance of leadership focusing on processes and procedures to ensure the efficient execution of digital transformation initiatives. Leaders should also establish specific, measurable goals for their teams to align with organizational objectives. Effective resource allocation, accountability enforcement, and well-defined metrics and KPIs were crucial for tracking and reporting progress. In summary, the transactional leader style is characterized by clarity in expectations, performance incentives, process focus, compliance assurance, resource allocation, defined metrics, and accountability enforcement, which enhance the likelihood of digital transformation success. Refer to (*Appendix 7*) for participants' detailed views and suggestions on question five.

5) What does the leadership need to achieve ODT success? (e.g., leader style, capabilities, etc.)		
Q5	Theme	Coding and Pattern
1	• Digital Transformation Leadership • Organizational Digital Culture • Innovation & Creative • Empathy and Emotional Intelligence	• Visionary leadership • Heart-to-heart leadership • Inspiring and motivating • Innovative and collaborative • Empowerment and intellectual stimulation • Coaching and developing others • Strong guidance and drive for responsibility • Individual consideration and inclusiveness
2	• Risk Management • Agile Execution & Program Management • Change Management & Communication	• Agile and adaptive • Performance monitoring • Risk Taking & Mitigation • Effective communication
3	• Supply Chain & Logistics Management • Process Management • Program Automation & Optimization	• Recognizing and rewarding • Complies with regulations • Resource management • Technical expertise • Data and process-driven
4	• Innovation & Technological Expertise • Budgeting & Track Controlling (BSC)	• Talent management • Result-oriented • Budget and Performance monitoring

Table 27: The Critical Keywords and Themes of the question Five

In summary of question five, ODT is crucial for organizations to remain competitive. Strong leadership is universally recognized as essential for driving change. Leaders play a pivotal role in recognizing digital potential, fostering innovation, and aligning strategy, culture, and technology for success. These themes represent crucial leadership imperatives for successful digital transformation. The first theme focuses on visionary and inspiring leadership, including a clear vision, motivation, sound judgment, and strategic management. These two highlight adaptive and agile leadership, fostering innovation, collaboration, adaptive decision-making, intellectual growth, coaching, and calculated risk-taking. Theme three emphasizes effective communication and engagement, covering transparency, individual considerations, inclusivity, recognition, and performance monitoring. Theme four centered on resource management and technical expertise encompassing regulations, resource allocation, technical proficiency, data utilization, and process-driven approaches. Theme five underscores talent management and a results-driven focus, including talent attraction and retention, measurable outcomes, and progress monitoring. (*Table 27*) for a

brief encapsulation of the prevalent insights from focus group interviewees regarding the imperatives of digital leadership within organizational digital transformation, along with theme delineation.

6) What are the organization's key objectives and goals from their ODT?

This question seeks to uncover various digital transformation goals across industries. The researcher can assess achievements, pinpoint gaps, and reveal challenges by doing so. Insights from interviews provide insights into broader ODT trends and best practices. At the same time, the analysis of strategies reveals common themes, innovative approaches, and success factors that can inform cross-organizational frameworks. Thirty interviewees (93.7%) prioritize operational efficiency, cost reduction, and revenue increase. Ninety percent seek new markets through unique digital models. ODT enhances the brand, customer trust, and talent attraction (81.2%). Digital tools optimize speed, resilience, and supply chain (78.1%). Half prioritize innovation, differentiation, stakeholder value, and ROI. Some focus on digital customer interaction. The statements below reflect insights from varied experiences and organizations. Refer to (*Appendix 8)* of the participants' response example of question six.

Organizational Digital Transformation (ODT) objectives vary across entities, but common themes emerge across industries. ODT primarily seeks to optimize operational efficiency, enhance customer experiences, foster growth, and build resilience, which involves refining operations, reducing costs, and improving accuracy. Digital tools are strategically used to elevate customer experience, establish strong customer connections, and gain a competitive edge. ODT also supports organizational growth by identifying new revenue streams, market opportunities, and innovative business models. Lastly, ODT is crucial in instilling resilience and adaptability to navigate disruptions, minimizing risks, and ensuring business continuity amid uncertainty.

These themes capture organizations' core objectives in their digital transformation (ODT) efforts. The first theme focuses on operational excellence, including process refinement, cost reduction, and revenue growth, while emphasizing adaptability to navigate market changes. The theme two revolves around business transformation and innovation, encompassing goals like implementing novel business models to propel growth and profitability, fostering fresh revenue streams through digital initiatives, and harnessing digital technologies to establish a competitive edge. The third theme underscores the paramount of customer-centricity and experience. It delineates aims to elevate customer interactions via digital channels, enhance digital brand standing, and augment stakeholder value and return on investment (ROI). The (*Table: 28*) illustrates the suggested common objectives and goals from the interview group.

6) What are the organization's key objectives and goals from their ODT?		
Q6	Theme	Coding and Pattern
1	• Agile Execution & Program Management • Budgeting Controlling	• Enhance operational efficiency • Reduce costs • Build resilience and agility
2	• Supply Chain and logistics Management • Project Management	• Ensure Supply Chain stability • Increase profit • Program Implementation
3	• Customer Relationship management • Innovation & creative	• Employee and Customer Engagement • Enhance Branding • New innovation for new business

Table 28: The Critical Keywords and Themes of the question Six

7) What competencies should be required for the ODT working team?

During organizational digital transformation, the composition of a proficient team assumes paramount significance in propelling the initiative's progression. This question seeks the collective insights of the group participants to unveil several essential competencies that organizations ought to seek within their digital workforce. By strategically cultivating these requisite competencies, organizations can guarantee the triumph of their digital transformation effort, ultimately bestowing value upon all stakeholders involved.

Over 90% of participants stressed the importance of fostering a digital literacy culture within the team, demonstrating a deep understanding of complex digital technologies and emerging applications and a solid technical background for implementation and analysis. Additionally, nearly 94% advocated practical project management skills, including tactical proficiency, resource management, and problem-solving. About 91% suggested the formation of a digital transformation steering committee involving senior management and cross-functional units. Cognitive processing was deemed critical by 78%, while 72% recommended familiarity with change management principles to address resistance and stakeholder concerns. Furthermore, 72% emphasized the team's agility in responding to the dynamic ODT environment.

Sixty-two and a half per cent of respondents emphasized the importance of 'walking the talk' and committing to continuous learning and upskilling. They also highlighted the need for digital ethics awareness, including cybersecurity, data privacy, bias, and ESG (Environment, Social, and Governance) practices. Furthermore, participants stressed the importance of strategic thinking and aligning ODT efforts with the organization's objectives and goals. Refer to (*Appendix 9*) for specific participant suggestions and comments.

It ensures the digital working team has these competencies, safeguarding the ODT efforts' success. All team members must focus on ongoing learning and development and be willing to invest in the tools and technologies necessary to support digital transformation. Team members have the skills and competencies to thrive in a digital environment and contribute to our organization's long-term success. Based on the insights from participants, Theme One explores essential digital competencies, including comprehensive digital literacy, data management skills, technical proficiency, and cognitive processing capabilities crucial for a digital transformation team. Theme Two highlights the strategic aspects of effective digital transformation, emphasizing attention to tactical details, establishing a dedicated digital transformation steering committee, and proficient project management, resource allocation,

change management, and strategic thinking. Theme Three underscores the importance of effective communication and collaboration within the digital transformation team, engaging with diverse stakeholders with exceptional proficiency. The team's tenacity and agility navigate the complexities of digital transformation, ensuring a steadfast commitment to optimal outcomes. This theme underscores team members' need for exceptional communication and collaboration proficiencies, smoothly engaging with diverse stakeholders. Steeled by qualities of tenacity and agility, the team maneuvers through the labyrinthine nuances of digital transformation, remaining resolute in its commitment to optimal outcomes. The researcher illustrates the suggested themes and patterns of competencies for the digital transformation team from the interview group (*Table: 29*).

7) What competencies should require for the ODT working team?		
Q7	Themes	Pattern and Coding
1	• Innovation & Technological Expertise • Project Management • Agile Execution and Program Management	• Digital Literacy • Managing Data Information & Analysis • Digital Technical Expertise • Cognitive Processing • Project Management
2	• Change Management & Communication • Digital Strategy Development • Human Resource Management • Data Analytics & decision Making	• Focus on Tactical Issues • DT Steering Committee • Change Management • Resources Management • Strategic Thinking
3	• Employee Engagement & Motivation • Digital Ethic & Social Responsibility • Team-work	• Effective Communication & Collaboration • Perseverance & Team-work

Table 29: The Critical Keywords and Themes of the question Seven

8) If you were in charge of the ODT, how would you improve the process?

Through leadership role insights, the researcher aims to understand participant perspectives on improving ODT and identifying challenges, opportunities, and solutions. Additionally, the researcher seeks actionable strategies for ODT improvement by soliciting concrete examples from participants, shedding light on crucial processes, technologies, and practices for advancing digital transformation within their organization. The researcher seeks to understand participants' perspectives on enhancing ODT by prompting them to envision leadership roles. This approach uncovers insights into their views on ODT challenges, opportunities, and potential solutions. Additionally, the researcher aims to identify actionable strategies from participants who provide concrete examples of processes, technologies, and practices essential for advancing digital transformation within their organization.

All participants emphasized the need for dedicated digital leadership to align a clear transformation strategy with organizational goals, establish robust governance, and secure adequate financial support and digital infrastructure for ODT. The majority (94%) recommended promoting collaboration, innovation, and agile methodologies while emphasizing change management, monitoring, and continuous improvement. 91% advocated cross-functional collaboration to enhance the digital user experience. Lastly, 90.6% suggested crafting a comprehensive digital talent strategy, including attracting top talent and engaging external stakeholders for effective process implementation.

Most participants (81.2%) emphasized soft management skills such as vision, communication, and individualized consideration for leadership. Additionally, 71.8% stressed hard management skills like clear expectations and performance monitoring. A robust data privacy and security framework garnered agreement from 78.1% of participants. Other essential aspects include fostering a culture of continuous improvement, risk-taking, and organizational learning. Developing data privacy and security frameworks was reiterated by 65.6% of respondents for regulatory compliance. Interestingly, only 34.3% considered technology selection a primary task for digital transformation leadership,

highlighting the importance of a people-driven approach. Refer to (*Appendix 10*) for excerpts showcasing diverse participant viewpoints.

The researcher distributes interviewee insights into five central thematic categories: Organizational Fundamentals, People-Centric Dynamics, Strategy Formulation, Competencies, and Competitive Advantage. These categories have the potential to enhance digital transformation and adapt to the evolving economic landscape. Theme One underscores the importance of strategic alignment and committed leadership in successful digital transformation, emphasizing the need for a well-defined digital strategy and visionary leadership. Theme Two focuses on human capital and organizational culture, highlighting the significance of employee engagement, diversity, skill development, and fostering digital expertise. Theme Three emphasizes agility and adaptability, emphasizing the importance of staying current with technology, optimizing operations, and managing resources effectively. Theme Four centres on data-driven insights and innovation, emphasizing measurement mechanisms, risk governance, data analytics, and fostering innovation. The last theme advocates customer-centricity, which stresses alignment with customer needs, efficient task delegation, and progress tracking. The associated patterns are summarized in (*Table 30*),

stemming from in-depth dialogues with the interview cohort.

8) If you were in charge of the ODT, how would you improve the process?		
Q8	Themes	Pattern and Coding
1	• Digital Strategy development • Organizational Digital Culture • Digital Transformation Leadership • Team-Work • Employee Engagement and Motivation	• Comprehensive Digital Strategy • Digital Vision & Mission • Digital Leadership • Financial & Management Support • Across Functional Support
2	• Innovation & technological Expertise • Project Management • Agile Execution & Program Management	• Inclusion & Diversity • Empowerment & Recognition • Skills & Learning Development • Talent Development • Agility and Adaptability
3	• Cybersecurity & Risk Management • Data Analytics & Decision Making • Process Automation & Optimization	• Measuring & Monitoring in Place • Risk Management • Data Analysis & Innovation • Operational Efficiency and Decision-making
4	• Innovation & Creative • Customer Focus and Experience • Customer Relationship Management	• Technological Trends & Core Technologies • Customer Centricity • Task Delegation & Tracking

Table 30: The Critical Keywords and Themes of the question Eight

9) What are the most significant elements we have discussed today relative to the 3H framework?

(Open question)

The researcher seeks to uncover participants' perceptions of critical factors for digital transformation success, particularly within the context of the 3H domains. This question,

posed at the end of the interview, serves as a valuable summary and conclusion to elicit any additional insights. Notably, all interviewees demonstrated a basic understanding of Yu's 3H management framework, facilitating a deeper exploration of the research topic and the synthesis of key themes and perspectives emerging from the interviews.

This exploratory question enables interviewees to express their views within the 3H model framework. Participants identified five key categories: Organizational Fundamentals and People-Centric Dynamics underpin the foundational aspects of ODT, while Strategy Formulation and Task Management relate to strategic and organizational capacities. Competencies and Competitive Advantage pertain to the technological processes within ODT operations.

There are 31 interviewees (96.8%) agreed that an organization's digital culture and leadership are the core spines of digital transformation that fall into the Heart domain (H^1). Thirty interviewees (93.7%) claimed that the digital transformation strategy and data analytics are the brains (Head-H^2) of the transformation, the same as the vehicle's steering wheel. They also suggested that technical know-how, project management, human resources management, technology and tools selection, and digital finance and accounting are the blood of the transformation, which keeps the momentum of the ongoing processing (Hand- H^3). Twenty-eight interviewees (87.5%) agreed that effective communication, resources management, technology, and strategy choice belong to the integration of Heart and Head domains (H4), and exact numbers of interviewees suggested that effective project translation, team capability, and competitive advantage are the integration of Head and Hand domains (H2). And twenty-nine interviewees (90.6%) commented that teamwork and engagement, decisiveness, agility, and learning culture belong to the integration of Heart and Hand domains. Twenty-five interviewees (78.1%) agreed that top management support, collaboration, and communication, change management program foster an innovation culture and experimentation that belong to the integration of Heart and Hand domains (H3).

However, twenty-one interviewees opined that share value, short-term wins, long-term gain, reward and recognition, career growth, and efficient coordination are the ODT's ultimate goals and the integration of all 3H domains (H1). Nevertheless, one interviewee objected that the 3H management framework would not be able to apply to the organization's digital transformation because many other external factors could destroy the change, which the force majeure factors such as COVID, war, and disasters. There are a few examples of suggestions and comments from the participants in (*Appendix 11)*.

9) What are the most significant elements we have discussed today relative to the 3H framework? (Open question)		
Q9	Theme	Coding and Pattern
1	• Resources Management • Organizational Culture • Digital Strategy Development • Digital Transformation Leadership	• Resources Allocation • Leadership Behavior • Impact on Organizational Culture • Explicit Statements of Commitment • Long-term Planning • Low-Handing Fruit
2	• Data Analytics & decision Making • Digital Ethic & Social Responsibility • Innovation & Technological Expertise • Supply Chain & Logistics Management	• Comprehensive Decision-Making • Sustainability Practices • Integration of Stakeholder Perspectives • Impact on Employee Motivation • Resources Re-analyze
4	• Agile Execution and Program Management • Employee Engagement and Motivation	• Frequency and Timing • Perceptions of Fairness • Alignment with Goals
5	• Project Management • Risk Management • Continuous Learning & Development • Process Automation & Optimization	• Communities of Practice • Knowledge Transfer on Ownership and Protection • Impact on Organizational Learning

Table 31: The Critical Keywords and Themes of the question Nine

Organizations characterized by unwavering dedication from their top management exhibit a heightened propensity for the successful execution of strategic initiatives. This commitment extends to facilitating innovation and cultivating a corporate culture deeply rooted in accountability. In such organizational environments, employees consistently exhibit heightened engagement and motivation. This heightened dedication is primarily attributed to their perception of top leadership's authentic and resolute commitment towards attaining

strategic objectives. The associated patterns have been succinctly summarized in (*Table 31*), derived from comprehensive and in-depth dialogues held with the interview cohort.

4.3.2 Cognitive Mapping of Qualitative Research Data

The researcher assigned labels, categories, or codes to data collected from focus group interview segments. This coding process guided the researcher in organizing, analyzing, logically understanding, and identifying the composed data's themes, logic, ideas, and patterns. Hereby the researcher summarized the data collected and converted into five different constructs which align with 3H framework as follows:

Heart domain (H^1)

The analysis of the collected data and derived themes highlights the critical role of the Heart domain, which encompasses emotional intelligence, empathy, and motivation within cognitive mapping, as a central framework for identifying the emotional and motivational factors driving an organization’s digital transformation. This domain provides a nuanced lens through which the human elements influencing transformation processes can be understood, emphasizing the interplay of emotions, relationships, and intrinsic motivators in shaping organizational outcomes that are associated with organizational fundamentals, such as organizational culture, change management, innovation and creativity, ethics and responsibility, and continuous learning were identified alongside people-centric dimensions, including heart-to-heart leadership, employee engagement and motivation, and diversity and inclusion.

These themes emerged from focus group interviews and synthesizing insights from the broader literature review, organizational observations, and existing theoretical frameworks.

This integrative approach ensures a comprehensive perspective, bridging empirical findings with established knowledge. By doing so, the analysis avoids over-reliance on a single data

source, enhancing the robustness and validity of the study's conclusions. The Heart domain's focus on emotional and motivational drivers underscores its pivotal role in enabling successful digital transformation by aligning human-centric factors with strategic and operational goals. *Table 32a* is the summary of Cognitive Mapping for Heart domain and its themes and sub-themes.

H Domain	Distinct Constructs	Sub-themes	References
Heart (H¹)	**Organizational Fundamental**	Organizational Digital Culture; Change Management and communication Digital Ethic & Social Responsibility; Continuous Learning & Development; Innovation & Creative	Bass, 1999; Holland & Light, 1999; Bono & Judge, 2004; Smith & Tushman, 2005; Birkinshaw et al., 2008; Casadesus-Masanell & Ricart, 2010; Hemerling et al., 2018;;
	People-Centric	Digital transformation Leadership; Empathy and Emotional Intelligence; Diversity & Inclusion; Employee Engagement and motivation	DeLone & McLean, 1992; Lee 1993; Bono & Judge, 2004; Cummings, 2004; Birkinshaw et al., 2008; Casadesus-Masanell & Ricart, 2010; Hemerling et al., 2018;

Table 32a: Cognitive Mapping Heart domain – by researcher

Head (H²)

The Head domain represents the cognitive and technical competencies essential for effective strategy formation and execution management in digital transformation. This domain emphasizes analytical and strategic thinking skills, critical for aligning organizational objectives with practical implementation. Core themes within this domain include developing and managing digital strategy, data analytics and business intelligence capabilities, digital technology proficiency, cybersecurity, risk management, infrastructure optimization, and process intelligence.

During the focus group interviews, participants input their insights into the progress of digital transformation backed by their own experiences. "*Strategy Formation & Execution Management*" is a central theme, underscoring the importance of bridging strategic intent with operational execution. Strategy formation focuses on the ability to conceptualize and design forward-looking digital initiatives aligned with organizational goals. Execution

management emphasizes translating these strategies into actionable plans through comprehensive risk assessments, implementing robust control mechanisms, and fostering targeted skill development within teams. This dual emphasis ensures that digital transformation efforts are visionary but also practical and sustainable. The framework of the Head domain highlights the interconnectedness of strategy and execution, addressing the complexities of digital transformation by ensuring that strategic initiatives are effectively implemented and managed to achieve desired outcomes. This comprehensive focus makes that an important area for addressing the challenges and opportunities inherent in digital transformation processes. *Table 32b* is the summary of Cognitive Mapping for Head domain and its themes and sub-themes.

H Domain	Distinct Constructs	Sub-themes	References
Head (H^2)	**Strategy Formation**	Digital Strategy Development; Digital Infrastructure; Legacy System Modification; Recognition & Rewarding	Hall & Rosenthal, 1993; DeLone & McLean, 1992; Bass, 1999; Casadesus-Masanell & Ricart, 2010; Berman, 2012; Bharadwaj et al., 2013; Westerman *et al.,* 2014; Hildebrandt *et al.,* 2015; Horlacher *et al.,* 2016; Holotiuk & Beimborn, 2017; Hemerling *et al.,* 2018; Vial, 2019, 2021; Udovita, 2020
	Execution Management	Data Analytics & Decision-making; Supply Chain and Logistics Management; Human Resources Management; Budgeting and Track controlling (Balanced-score Card); Cybersecurity & Risk Management	

Table 32b: Cognitive Mapping Head domain – by researcher

Hand (H^3)

The Hand domain represents the practical skills, technical expertise, and operational capabilities organizations require to enhance efficiency, streamline processes, and reduce costs. It emphasizes applying real-world insights, innovative methods, and systematically designed programs to strengthen daily operations and deliver measurable outcomes.

Core themes within this domain include improving workflows and operational efficiency

through technological expertise, which facilitates the adoption of new technologies. Additionally, the domain emphasizes building stronger customer relationships, mainly through implementing advanced systems such as Enterprise Resource Planning (ERP). Sales and customer service are essential to business success, alongside financial management, process automation, and system optimization. Collectively, these areas enable organizations to operate more effectively and achieve superior results.

The Hand domain further underscores the necessity of aligning operational competencies with broader organizational objectives. Organizations are better equipped to adapt and succeed in dynamic and rapidly evolving environments by ensuring that practical efforts address both immediate challenges and long-term strategic goals. By bridging hands-on execution with strategic intent, the Hand domain emerges as a cornerstone of organizational effectiveness. It enables translating strategies into actionable results, fostering efficiency, resilience, and competitiveness in an increasingly complex and fast-paced business landscape (*Table 32c*).

H Domain	Distinct Constructs	Sub-themes	References
Hand (H^3)	**Competencies and Competitive Advantage**	Process Management; Innovation & Technological Expertise; Customer Relationship Management (CRM); Enterprise Resource Planning (ERP); Sales & Customer Services; Finance efficiency; Process Automation & Optimization;	Leonard-Barton, 1992; Prahalad & Hamel, 1997; Agha et al., 2012; Berman, 2012; Bharadwaj et al., 2013; Westerman et al., 2014; Hildebrandt et al., 2015; Horlacher et al., 2016; Holotiuk & Beimborn, 2017

Table 32c: Cognitive Mapping Hand domain – by researcher

Heart and Head integration (H4)

Establishing achievable objectives within a supportive environment requires the integration of organizational fundamentals and people-centric (Heart) and analytical capabilities (Head) to inspire and direct team efforts. This approach fosters vertical and horizontal alignment through transparent communication channels (Bharadwaj, 2000; Liu *et al.,* 2012). Effective

digital leadership promotes a culture that encourages calculated risk-taking, underpinned by carefully structured financial investments and collaboration with resources, data-driven transformation strategies. Such efforts aim to achieve a comprehensive and effective DT work atmosphere and cohesive transformation strategy.

- Innovative and Daring Work Atmosphere
- Precise and Cohesive Digital Strategy
- Resources Management

Heart and Hand Integration (H3)

Fostering an innovative and experimental digital culture requires a strategic combination of team efforts and practical competencies. By nurturing creativity (Heart), organizations can inspire the exploration of new technology, decisive implementation and learning. Concurrently, deploying practical tools and processes (Hand) enables rapid and efficient testing and implementation of new initiatives (Horlacher *et al.,* 2016).

- Teamwork
- Sound Judgment and Decisiveness
- Attitude and Learning

Head and Hand integration (H2)

An agile development approach integrates analytical reasoning with practical skills to drive targeted improvements (Horlacher et al., 2016). Leveraging data analytics and business intelligence (Head) supports data-informed decision-making. It enhances effectiveness, while agile methodologies and core competencies (Hand) enable flexible, collaborative delivery of digital initiatives, translating strategic goals into actionable tasks. Additionally, this approach requires effective conflict management to address team dynamics and ensure smooth project progression, alongside stringent data privacy measures to protect sensitive

information and maintain compliance within the agile framework (Verhoef *et al.*, 2021).

- Accountability & Effectiveness
- Conflicts Management
- Data Privacy and Cybersecurity

3H integration (H1)

The holistic 3H domains approach facilitates a comprehensive digital transformation by addressing the complex interplay between the integration of Head, Heart, and Hand domains. This integrated framework provides a comprehensive perspective that, including analytical skills and strategic insight, merges with emotional elements, such as team engagement and motivation, while practical aspects, like technology implementation, are aligned with leadership and innovation. Furthermore, the approach supports a balanced top-down management style, emphasizing short-term achievements to build momentum. Recognition of knowledge sharing and collaboration across teams reinforces this transformation process, promoting a culture that values continuous improvement and organizational alignment (Hoberg *et al.,* 2015).

- Top-down management commitment
- Short-term wins strategy
- Rewarding and Recognition
- Knowledge Sharing
- Indispensable Collaboration

Table 33 is the summary of the integrating domains and their practical skills and competencies.

Domain	Sub-Themes
Heart & Head (H4)	• Innovative and Daring Work Atmosphere • Precise and Cohesive Implementation • Operational Resources Management
Heart & Hand (H3)	• Teamwork • Sound Judgment and Decisiveness • Attitude and Learning
Head & Hand (H2)	• Accountability & Effectiveness • Conflicts Management • Data Privacy and Cyber protection
3H Integration (H1)	• Top-down Management commitment • Short-term wins Strategy • Rewarding and Recognition • Knowledge Sharing • Indispensable Collaboration

Table 33: Cognitive Mapping Integrate domain – by researcher

4.4 Questionnaire Design and Description

Research instruments are crucial for data collection, measurement, and analysis, ensuring reliability and validity (Rabiee, 2004; Zohrabi, 2013). This study is composed into two instruments, the initial instrument, structured Focus Group Interview questions, investigates collaborative with ODT across domains like IT, Human Resources, leadership, organizational culture, competencies, operation, strategic management, and outcomes (Bulsara, 2015; Legner *et al.,* 2017). The researcher identifies the key research objectives and questions for the focus group, bridging gaps in the study through a comprehensive literature review. The interview questions were developed with careful consideration, drawing upon relevant literature, academic surveys, and established theories, with a clear focus on managerial perspectives, knowledge, and experiences related to the adoption of success factors in ODT, in alignment with the research questions. Engaging key stakeholders in focus group interviews gave valuable insights into adopting success factors for ODT, effectively addressing the research objectives.

In crafting focus group interviews, the researcher composed a purposeful approach to gather insightful data. Drawing from both these qualitative findings and established academic

survey questionnaires, the researcher composed a set of questions that addressed the key themes identified—such as challenges, strategies, successes, and stakeholder perspectives in ODT. The questions were carefully structured to align with the study's objectives, progressing from general to specific topics and incorporating probing elements to capture nuanced insights and real-life examples. Ethical considerations guide this process to ensure participant comfort.

These questions, such as introspective, exploratory, scenario-based, and reflective, are skillfully combined to create a dynamic and all-encompassing dialogue. The researcher conducted two practices to test the pre-designed interview questions to achieve the best result. First, the researcher emails the question list to six selected participants, and they're not part of the final sample for the focus group interview. The researcher individually discussed these questions with them to ensure their understanding of the objectives and ability to provide ideal answers. Adjustments and rephrasing were made to enhance clarity.

The questionnaire survey comprises forty-nine carefully designed questions, drawing insights from relevant literature, prior survey research, and academic studies. The core questionnaire survey in this study structures into four distinct sections. The initial section consists of 30 questions (Q1–Q30), structured around five key constructs identified by integrating focus group interviews and literature review findings. These constructs are aligned with the seven distinct H domains within the 3H managerial framework, specifically related to organizational digital transformation (ODT). Derived from qualitative research findings, these constructs were systematically translated into questionnaire items to ensure conceptual alignment and empirical validity. The researcher provides a few samples as below (*Table 33a*). These constructs embody the pivotal concepts under scrutiny and are foundational for crafting the questionnaire. The researcher emphasized that the alignment between questionnaire items and research constructs is imperative; any disconnection may impede the survey's capacity to furnish pertinent insights to address the research inquiries.

H Domain	Distinct Constructs from focus group interview	Survey question	References question
Heart (H^1)	Organization Culture & Employee Engagement	6) There is a high level of trust between management and workers in my organization.	My organization maintains a strong level of trust between management and employees throughout the digital transformation process. (Boutetiere & Reich, 2018)
Head (H^2)	Digital Strategy & Controlling	21) My organization has strategic management performance metrics that improve digital transformation progress.	Organizations need to utilize strategic management performance metrics to effectively enhance digital transformation progress. (Kiron *et al.,* 2016);
Hand (H^3)	Process Management & Technological Expertise	26) Our ODT team has sufficient digital skills and experience to execute our organization's digital transformation process.	The digital transformation team must have the necessary skills and experience to effectively execute the organization's digital transformation process.(Kiron *et al.,* 2016; Boutetiere & Reich, 2018

Table 33a: Samples of results of qualitative research transformed into questionnaire survey

The researcher allocates these thirty questions to correspond with the seven H domains identified and formulated during the initial research phase, aligning with Yu's 3H framework. These domains encompass *Heart (H^1), Head (H^2), Hand (H^3), Heart & Head (H4), Hand & Heart (H3), Head & Hand (H2), and 3H integrated (H1)*. Yu's study (2021) explained that, within the organizational context, the Heart domain pertains to emotional and psychological facets that influence operational adoption and success. It encompasses the collective attitudes, beliefs, and cultural dimensions of the organization and its personnel, alongside inter-stakeholder trust and collaboration. Achieving prosperous digital transformation mandates technological advancements and a shift in mindset and organizational ethos (Bharadwaj *et al.,* 2013). Effective change necessitates adept communication by leaders, inclusive employee involvement in decision-making, and robust support and training mechanisms (Dvir *et al.,* 2002; Eisenbeiß & Boerner, 2013). (*Table 34)* presents the questionnaire survey structure for each H domain.

H domain	Question
Heart (H^1)	Q: 1, 3, 6, 7, 8, 12
Head (H^2)	Q: 2, 5, 20, 21, 24, 28
Hand (H^3)	Q: 13, 14, 16, 26, 27
Heart & Head (H4)	Q: 11, 18, 22
Heart & Hand (H3)	Q: 15, 29, 30
Head & Hand (H2)	Q: 10, 17, 25
3H integrated (H1)	Q: 4, 9, 19, 23

Table 34: Questionnaire Survey Structure for each H domain

Organizations must prioritize employee well-being to prevent burnout and other adverse outcomes during transformation. These elements collectively form the *'Heart'* domain, significantly impacting digital transformation success by shaping employee perceptions and engagement. The *'Head'* domain involves top-level leadership responsible for digital strategy formulation and execution, setting the organizational tone and providing essential resources for digital initiatives. This domain navigates digital disruption, fosters innovation, and inspires teams to embrace change. Equally vital is the *'Hand'* domain, responsible for developing and implementing new systems, processes, and technologies to enhance agility, innovation, and customer-centricity. Effective Hand-domain teams collaborate, adapt to evolving needs, and leverage cutting-edge technologies to drive digital innovation and gain a competitive edge.

The second part of the questionnaire is five questions (Q31-Q35) on the Likert scale and one open question (Q36), which evaluates the performance of the organization's digital transformation in different dimensions, such as the organization's profitability, customer experience, operational efficiency, and new innovative products and services by ODT. The third part of the survey is five questions (QA – QE) about the additional ideas and insights about implementing digital transformation. That allows the researcher to obtain extra views that the first part of the questionnaire could not cover. Furthermore, all those questions are based on previous studies and academic research; however, a simple modification is clear, concise, easy to understand, and carefully worded to avoid bias or leading responses. The last part of the questions (QF – QM) are the descriptive data, such as demographic and geographic information, allowing the researcher to evaluate the relationship and correlate it with different perspectives. The summary of references correspondence for each domain shown below (*Tables: 35 – 41*).

Heart (H^1)			
Operationalization H Domain	**Q**	**Question**	**References**
Organization Culture	1	Our ODT team members remain open to new ideas and innovation.	Kiron et al. (2016); Forth et al. (2020a); Verhoef et al. (2021)
Change Management & Communication	3	My organisation has been meticulous in aligning vertically and horizontally of divisions and units to effectively implement strategies.	Kiron et al. (2016); Boutetiere & Reich, (2018); Verhoef et al. (2021)
Organization Culture & Inclusion	6	There is a high level of trust between management and workers in my organization.	Kane et al. (2015); Forth et al. (2020a); Gurumurthy et al. (2020); Verhoef et al. (2021)
Leadership	7	Our ODT project leader can efficiently coordinate, organize, and smooth-running among different function units on goal accomplishment.	Avolio & Bass (2004); Kane et al., (2015); Boutetiere & Reich, (2018); Gurumurthy et al, (2020)
leadership and communication	8	Our ODT project leader can communicate facts and ideas clearly, convincingly, and organized manner across the organization.	Avolio & Bass (2004); Kane et al., (2015); Boutetiere & Reich, (2018); Verhoef et al., (2021)
Empathy and Emotional Intelligence	12	Our ODT leader is a 'heart-to-heart' leader with a spirit that motivates and nurtures others to succeed in digital transformation.	Avolio & Bass (2004); Kiron et al., (2016); Boutetiere & Reich, (2018); Verhoef et al., (2021)

Table 35: The summary of references correspondence for Heart (H^1) domain

Head (H^2)			
Operationalization H Domain	**Q**	**Question**	**References**
Track controlling	2	My organization is very controlled and structured, and formal procedures generally govern what people do.	Hambrick & Cannella (1989); Lee & Ko (2000); Schwartz & Bardi (2001); Maskin & Sjöström (2002) Helfat & Peteraf (2003); Raisch & Birkinshaw (2008); Hanafizadeh & Ravasan (2011); Kane *et al.* (2015); Kiron *et al.* (2016); Verhoef *et al* (2021)
Digital Strategy Development	5	Our ODT project leader creates and fosters a motivational culture that encourages employee commitment to implementing ODT processes.	
Human Resources Management	20	My organization's HRM supports programs and activities that attract talent for digital transformation.	
Project Management on Monitoring Strategy	21	My organization has strategic management performance metrics that improve digital transformation progress.	
Data Analytics & Decision-making	24	My organization is strategic in choosing the right technology for digital transformation.	
Digital Strategy Development	28	My organization can exercise flexible measures to tackle unforeseen barriers encounters in the process its digital transformation.	

Table 36: The summary of references correspondence for Head (H^2) domain

Hand (H^3)			
Operationalization H Domain	**Q**	**Question**	**References**
Core Competency and Capabilities	13	Our ODT leader project leader has sufficient technical knowledge to lead digital transformation projects.	Somers & Nelson (2001); Dvir *et al.* (2002); Sharpe *et al.* (2006); Ravasan (2011); Gelfand *et al.* (2012) Kane *et al.* (2015); Boutetiere & Reich (2018); Verhoef *et al.* (2021); Hanafizadeh &
Process Management	14	A competent work team executes our digital transformation strategy.	
Process Management	16	Our ODT team promotes and maintains a professional demeanour in stressful and difficult situations.	
Innovation & Technological Expertise	26	Our ODT team has sufficient digital skills and experience to execute our organization's digital transformation process.	
Core Competency & Competitive Advantage	27	My organization is able to implement relevant digital technologies for ODT, which differentiates it from competitors.	

Table 37: The summary of references correspondence for Hand (H^3) domain

Heart & Head (H4)			
Operationalization H Domain	**Q**	**Question**	**References**
Innovative and Daring Work Atmosphere	11	Our ODT project leader creates an environment that encourages, recognizes, and rewards risk-taking, creativity, and innovation.	Denison *et al.* (2004); Barbuto (2005); Hrebinia, (2006); Raisch & Birkinshaw (2008); Kane *et al.* (2015); Boutetiere & Reich (2018); Sousa & Rocha (2019); Verhoef *et al.* (2021)
Resources Management & Financial Support	18	My organization has sufficient financial budget for the digital transformation project.	
Precise and Cohesive Digital Strategy	22	My organization has a clear and coherent digital strategy integral to its overall corporate strategy.	

Table 38: The summary of references correspondence for Heart & Head (H4) domain

Hand & Heart (H3)			
Operationalization H Domain	**Q**	**Question**	**References**
Teamwork	15	Our ODT team emphasizes cooperation and a team approach to work.	Sharpe *et al.* (2006); Raisch & Birkinshaw (2008); Van Wijk *et al.* (2008); Gelfand *et al.* (2012); Kane *et al.* (2015); Kiron *et al.* (2016); Verhoef *et al.* (2021); Yu (2021)
Sound Judgment and Decisiveness	29	Our ODT leader can make good judgments and be decisive.	
Attitude & Learning	30	Our ODT team learns from failures to achieve transformational goals.	

Table 39: The summary of references correspondence for Heart & Hand (H3) domain

Head & Hand (H2)			
Operationalization H Domain	**Q**	**Question**	**References**
Effective Process management	10	Our ODT project leader has effectively translate the digital transformation strategy into actionable activities across the organisation.	Schwartz & Bardi (2001); Sharpe *et al.* (2006); Raisch & Birkinshaw (2008); Kane *et al.* (2015); Boutetiere & Reich (2018); Sousa & Rocha (2019); Verhoef *et al.* (2021); Yu (2021)
Conflicts Management	17	Our ODT project leader initiates and supports strategies and programs to manage conflict resulting from organizational change.	
Risk and Cyber Protection	25	My organization is able to control cyber security and data privacy, which are essential skills for effective digital transformation.	

Table 40: The summary of references correspondence for Head & Hand (H2) domain

3H integrated (H1)			
Operationalization H Domain	**Q**	**Question**	**References**
Top Management Commitment	4	My organization has a clear management commitment and effective leadership from the CEO across all levels of management.	Hannan & Baron (2002); DeLone & McLean (2003); Casadesus-Masanell & Ricart (2010); Gelfand *et al.* (2012); Westerman, (2012); Bharadwaj *et al.* (2013); Kane *et al.* (2015); Kiron *et al.* (2016); Verhoef *et al.* (2021); Yu, (2021)
Sense of Achievement for Motivation	9	Our ODT project leader promotes more "short-term wins" that positively impact the organization's move toward the overall change goals.	
Recognition & Rewarding	19	My organization recognizes and rewards team members based on performance.	
Knowledge sharing	23	My organization creates a platform that facilitates the internal and external exchange of knowledge.	

Table 41: The summary of references correspondence for 3H Integrated (H1) domain

While many questions drawn from established research and studies, subtle refinements were made to the wording to amplify respondents' understanding of the study's objectives, see (*Appendix 12)* which is the complete questionnaire survey. Closed-ended questions serve as pivotal tools for quantifying primary constructs, and alongside these, demographic questions play a crucial role in characterizing and analyzing the sample's unique characteristics. The survey length is crucial, as lengthy surveys can lead to participant fatigue and reduced motivation, resulting in lower response rates and potentially invalid results (Van Teijlingen & Hundley, 2002). This accordant composite of questions ensures data collection's depth and breadth,

For ease of accessibility, the questionnaire is available in English, traditional and simplified Chinese to accommodate respondents from Hong Kong, Taiwan, and mainland China. To ensure the reliability of the translations, the researcher sought the expertise of two academic experts, one from China Jinan University and the other from Nanjing Communications Institute of Technology. Conducted through Google Form and the Chinese survey platform Wenjuanxing (問卷星), the final questionnaire serves as the primary instrument to measure the five constructs, each representing a distinct and integrated H domain within the 3H

framework.

4.5 Discussion of Qualitative Research Findings

Qualitative research can provide rich insights into complex processes such as digital organizational transformation, particularly holistic management, which involves a comprehensive and integrated approach to managing organizational change, considering the social, economic, and environmental factors that affect the organization's performance (Ritchie & Spencer, 2002; Creswell *et al.,* 2007; Leech & Onwuegbuzie, 2008).

This chapter explores qualitative research findings from semi-structured focus group interviews, examining holistic management in digital organizational transformation from four perspectives. Firstly, we identify pivotal themes and concepts through thematic analysis systematically code and categorize data to reveal patterns, providing a comprehensive research overview. These findings lay the groundwork for in-depth discussions and potential future research. For example, data may unveil themes such as leadership support, employee engagement, and stakeholder involvement in digital transformation initiatives, serving as foundational points for subsequent discussions.

After identifying key themes and concepts, the second step involves critically analyzing research implications in digital transformation. This examination assesses the congruence or deviation of results from established holistic management theories and best practices. For instance, the study might highlight the significant influence of leadership support on digital transformation success. This discussion explores its relevance to existing leadership theories in holistic management and its implications for future digital transformation practices. Additionally, it is essential to acknowledge research strengths and limitations, including methodology, sample size (e.g., *n=32*), data collection methods, potential biases, and analytical factors. For example, the limited sample size cautions against broad generalizations, emphasizing the need for further research validation.

The last approach identifies research gaps, proposes new inquiries, and extends possibilities. Qualitative ODT research provides deep insights into holistic management during organizational digital transformation, emphasizing the importance of stakeholder involvement. A critical analysis of qualitative findings empowers researchers to enhance holistic management knowledge in digital transformation, contributing to informed organizational change practices.

The focus group questions, informed by relevant literature, uncovered a consensus among participants regarding the significance of digital transformation for competitiveness and preventing market share loss. That extends beyond technology to encompass organizational culture, digital fundamentals (including digital culture, change management, and employee engagement), and people-centric factors such as digital leadership and emotional intelligence, supported by prior research (Chow & Cao, 2008; Pettigrew *et al.,* 2001; Nambisan *et al.,* 2017; Yoo *et al.,* 2010). The study revealed differing viewpoints between administrative and technological management, which administrative management in ODT prioritizes business continuity, cost control, and structured changes, focusing on risk mitigation and employee adaptation. In contrast, technological management emphasizes rapid innovation, system efficiency, and digital adoption, advocating for agile implementation and risk-taking. Notably, 87.5% of C-Suite executives highlighted the important role of an entrepreneurial culture that encourages experimentation and embraces digital technologies for successful digital transformation.

However, 56.2% of participants emphasized change management's significance, including engaging employees in planning, communicating, and implementing organizational changes. Effective change management minimizes resistance, fosters ownership (93.8%), and ensures employees understand digital transformation's benefits. Administrative management prioritizes broader concerns, while functional units focus on practicality. Additionally, most participants (90.6%) stressed effective communication's importance for

building trust and reducing employee anxiety about digital transformation's impact. Clear, consistent communication (100%) aligns with stakeholders' objectives. Furthermore, 87.5% highlighted intensive transformational processes, like employee engagement, for success. To promote a culture of innovation, organizations should invest in initiatives such as training and development, as engaged employees contribute ideas and feedback, improving digital transformation efforts.

As previously mentioned, human involvement is central to digital transformation. The findings highlight a strong emphasis (93.8%) on people-centric aspects, mainly digital transformation leadership. These leaders possess the vision, skills, and knowledge to drive digital change, identify innovative opportunities, establish strategic goals, and communicate the benefits of transformation (90.6%) to stakeholders. Navigating digital complexities (75%), such as data security, while fostering innovation and collaboration is imperative. Additionally, empathy and emotional intelligence (81.2%) are essential for understanding and addressing employee concerns and fears, which help build trust. Emotional intelligence aids leaders in effectively managing emotions and guiding organizations through digital challenges. Furthermore, maintaining a customer focus (56.2%) is crucial to ensure customer value remains central. Organizations prioritizing customer-centricity during digital transformation are more likely to succeed by aligning digital solutions with customer needs and preferences.

All interviewees (100%) unanimously confirmed the importance of a well-defined digital transformation strategy, which provides a clear organizational roadmap and aligns objectives. A key aspect of this strategy (90.8%) involves delineating transformation goals, technologies, and processes for goal achievement. Proficient project management (84.3%) is crucial for complex digital transformations, ensuring timely and cost-effective project completion through goal setting, timelines, and monitoring. Teamwork (90.6%) is equally fundamental, requiring a collaborative culture (93.7%) that embraces change, innovation, and cross-functional cooperation. Empowering employees is essential for effective digital

transformation as they adopt new technologies and processes significantly.

Translating a potent digital transformation strategy (93.7%) into actionable processes requires adept task management, including program management, agile operations, progress assessment, and measurement tactics. These systematic elements ensure desired outcomes, with program management playing a pivotal role in synchronized efforts towards predetermined objectives. Agile processes (90.6%) enhance flexibility and responsiveness by segmenting projects, prioritizing tasks, and allowing iterative adjustments. Performance assessment and measurement strategies (70%) involve tracking, identifying enhancements, and securing intended transformational outcomes and ROI. This evaluative approach empowers adaptable strategies with structured KPIs (81.3%) informed by balanced-score card analysis and data-driven decision-making, ensuring the steadfast pursuit of digital aspirations.

ODT involves adopting new technologies (96.8%) and leveraging existing capabilities for fresh business opportunities. Recognizing competencies leads to a tailored digital transformation strategy (90.8%) aligned with an organization's unique abilities. Developing new proficiencies should focus on emerging trends, enhancing strengths, and facilitating integration (71.2%). This approach fosters competitive distinction, opening new avenues for success (81.2%). Continual learning (62.5%) is essential for ongoing improvement. Risk management (56.2%) addresses challenges in digital transformation, emphasizing the need for substantial organizational investment for robust returns (ROI). In conclusion, the competencies and advantages shape the digital journey like a dragon boat crew harnessing unique strengths for victorious conquest.

Derived from the comprehensive qualitative research data, the researcher identified and synthesized five distinct constructs that encapsulated the key themes within the domain of Organizational Digital Transformation (ODT), as illustrated in Figure 14. These themes

included:

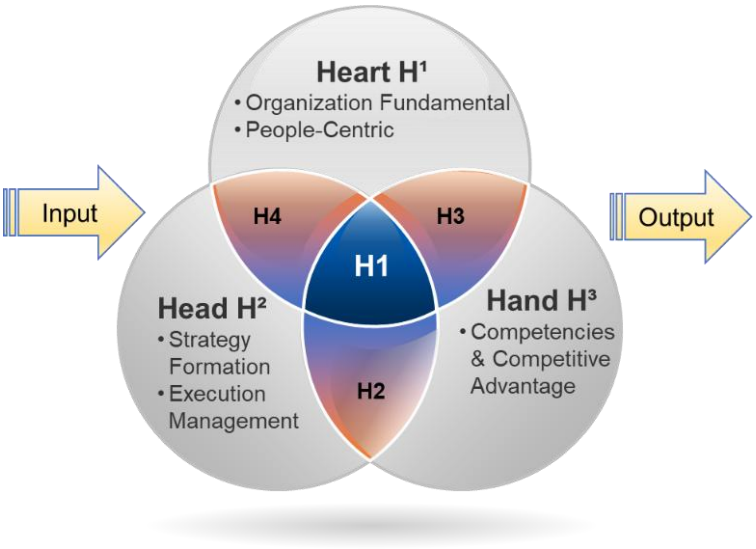

Figure 14: Five constructs align with seven distinct H domains – By Researcher

- ***"Organization fundamental"*** construct represents a critical foundation for enabling successful digital transformation by embedding essential norms within an organization's framework. It encompasses the cultivation of an Organizational Digital Culture, fostering an environment that embraces digital tools, practices, and mindsets to drive innovation and collaboration. The construct also includes Change Management, ensuring structured processes and effective communication strategies to overcome resistance and align stakeholders throughout the transformation journey.

Additionally, business ethics and corporate social responsibility (CSR) are important in terms of ethical considerations and corporate accountability when leveraging digital technologies. An organization needs to build a learning environment to highlight further the necessity for ongoing education and skill-building to remain competitive in the rapidly evolving digital landscape. Finally, the construct incorporates innovation and creativity, focusing on generating new ideas and solutions that propel organizations forward and ensure sustained growth in dynamic markets. These interconnected norms provide a robust framework for aligning digital transformation initiatives and long-term strategic objectives.

- ***"People-Centric"*** refers to the human-centred dimensions essential for driving and sustaining digital transformation initiatives. At its core is Transformation Leadership, which involves visionary leaders who can inspire, guide, and manage change effectively with empathetic behaviour while aligning people with organizational goals in this digital landscape. Ensure leaders and teams understand and address individuals' emotional and psychological needs during change and foster a supportive and resilient organizational culture.

Moreover, this construct emphasizes the importance of diversity and inclusion, recognizing that varied perspectives, backgrounds, and experiences enhance creativity and problem-solving capabilities, which are crucial for navigating the complexities of digital transformation. Additionally, all levels of engagement and motivation are central to this construct, focusing on empowering employees, fostering a sense of ownership, and maintaining high morale to ensure commitment to transformation goals. These norms create a robust, people-centred framework that prioritizes the human element in achieving successful digital transformation.

- **"Strategy Formation"** serves as an essential foundation for orchestrating successful digital transformation by emphasizing structured planning and execution. At its core is the strategy for the ODT, which involves designing a clear roadmap that aligns digital initiatives with organizational goals, ensuring that resources and efforts are effectively directed. Complementing this is the focus on IT landscaping and infrastructure, which is the importance of building and maintaining robust technological foundations that enable seamless integration and scalability of digital solutions, and the modification of its Legacy System that plays a vital role in this construct, highlighting the need to modernize or adapt existing systems to support new digital capabilities while ensuring minimal disruption to ongoing operations. Furthermore, during the transformation process, a heartfelt recognition and reward, such as a short-term win, can emphasize the importance of motivating and incentivizing employees to embrace and contribute to the transformation process, fostering

a culture of commitment and innovation. Together, these interconnected norms provide a comprehensive framework for strategy formation, ensuring that organizations are well-prepared to navigate the complexities of digital transformation.

- ***"Execution management"*** is an integrated approach that optimizes business performance across various key domains. It leverages digital data analytics and decision-making when selecting technology to transform raw data into actionable insights and guide strategic and operational decisions. During the transformation process, the organization must adopt a well-planned supply chain and logistics management to ensure the smooth flow of goods and services, minimizing disruptions and maximizing efficiency. It aligns with organizational goals, ensuring talent is effectively utilized and developed. Through a robust Controlling practice, such as the Balanced Scorecard approach, execution management ensures financial objectives are met while monitoring performance metrics across all areas. Moreover, to face today's digital crimes, solid cybersecurity and risk management are embedded to protect organizational assets and mitigate potential threats, ensuring business continuity in an increasingly digital and complex world. These components create a cohesive framework that drives operational excellence and ensures strategic achievement.

- ***"Competencies and Competitive Advantage"*** are built upon a strong foundation of key capabilities that differentiate an organization in the market. A streamlined process management and efficient operations enabled consistent delivery of value. To drive continuous development, technological expertise with the most significant innovative mindset can position the organization to adapt to changing market demands and create cutting-edge solutions. With Customer Relationship Management (CRM) and ERP systems, the organization fosters lasting relationships, enhancing customer satisfaction and loyalty, integrating core business functions, and enabling data-driven decision-making and operational efficiency. The organization maximizes revenue opportunities through effective sales and services while maintaining high customer satisfaction levels. Finance efficiency

ensures optimal resource allocation, which, aligned with process automation, could increase productivity and reduce costs, positioning the organization for sustainable growth and competitive success in an ever-evolving market landscape.

4.6 Propose Hypothesis

This section uses an exploratory sequential mixed-methods approach to present the study's hypotheses, which are key to understanding successful organizational digital transformation. Grounded in literature, theoretical frameworks, and qualitative insights, these hypotheses highlight critical factors influencing digital transformation. Rooted in a conceptual framework integrating digital transformation, organizational change, and strategic management, they guide data collection and analysis, providing a structured basis for empirical exploration. A comprehensive literature review has identified key factors shaping digital transformation success. These include leadership efficacy, organizational culture, technological capabilities, workforce engagement, and change management strategies. This chapter sets the stage for empirical analysis to generate new insights and contribute to the growing knowledge of ODT.

This study proposes seven hypotheses, each framed as perceptions, derived directly from the theoretical framework and the identified influential factors. These hypotheses aim to move beyond surface-level observations by examining the connections, patterns, and potential causal correlations within the complex organizational digital transformation (ODT) phenomenon. Framing the hypotheses as perceptions allows for the exploration of subjective experiences and interpretations of key stakeholders, providing deeper insight into the dynamics of ODT. The researcher ensured logical coherence and methodological alignment, as each hypothesis is grounded in a combination of existing literature and findings from the qualitative research phase. By investigating the interrelationships between various variables and exploring possible causal correlations within ODT, these hypotheses

provide a foundation for systematic exploration and empirical validation, contributing to a more nuanced understanding of digital transformation processes in organizational settings.

Hypothesis One (Hy1): This hypothesis posits that the alignment of leadership's Heart domain significantly influences the success of organizational digital transformation. Leaders who demonstrate empathy and emotional intelligence are important in cultivating a supportive digital culture that embraces change and fosters collaboration. Effective change management, driven by clear communication and an emotionally intelligent leadership style, promotes a culture of innovation. This alignment enables leaders to navigate the complexities of digital transformation, reducing resistance and enhancing engagement. Consequently, building trust and managing emotions within the organization is closely associated with successful digital transformation outcomes, enhancing adaptability and long-term effectiveness. Through this hypothesis, the study aims to uncover the role of leadership attitudes, values, and emotional intelligence in influencing the overall success of digital transformation endeavors.

- *Hypothesis One (Hy1): The Heart domain (H^1), which manifests in heart-oriented leadership, is related to ODT success.*

Hypothesis Two (Hy2): This hypothesis suggests a statistically significant relationship between the Head domain in strategic management and successful organizational digital transformation. Leaders with solid strategic capabilities who effectively develop and implement digital strategies are better positioned to guide the transformation process, which involves data-driven decision-making, leveraging process intelligence, and allocating resources to optimize digital initiatives. Focusing on risk and control management also allows leaders to navigate digital disruptions and uncertainties effectively. Organizations that integrate strategic foresight with rigorous data analysis and process oversight are more likely to achieve successful digital transformation, ensuring resilience and long-term competitive

advantage. Through this hypothesis, the study seeks to empirically establish the role of strategic leadership in shaping the success of digital transformation efforts within organizations.

- *Hypothesis (Hy2): The Head domain (H^2), which manifests in a strategic management process, is related to ODT success.*

Hypothesis Three (Hy3): This hypothesis examines the relationship between the Hand domain in functional competencies and ODT success. Agile execution and effective program management, driven by proficient functional teams, play an essential role in the transformation process. Organizations with teams skilled in process automation, optimization, and rapid adaptation to new technologies demonstrate enhanced capacity to meet evolving digital requirements. When aligned with agile methodologies, core competencies enable organizations to streamline operations, creating a competitive advantage in digital landscapes. The study highlights how functional expertise contributes to the successful execution and implementation of digital transformation initiatives, emphasizing the importance of hands-on capabilities in navigating complex ODT projects and ensuring sustainable outcomes.

- *Hypothesis (Hy3):The Hand domain (H^3), which manifests in functional competencies, is related to ODT success.*

Hypothesis Four (Hy4): This hypothesis delves into the association between the synergistic integration of the Heart, Head, and Hand domains and the success of the organizational digital transformation. The study recognizes four specific integration scenarios: i) Heart & Head (H4), ii) Hand and Heart (H3), iii) Head & Hand (H2), and iv) 3H integrated (H1). These integration patterns represent varying levels of alignment and collaboration among digital transformation's emotional, strategic, and functional dimensions. The hypothesis posits that organizations effectively orchestrating these integrations will

exhibit higher levels of digital transformation success. The researcher aims to uncover the nuanced interplay between these domains and their combined impact on achieving successful outcomes in the complex landscape of organizational digital transformation.

This study hypothesizes that the synergistic integration of Heart and Head domains is related to the success of ODT. The Heart domain, encompassing empathy, psychological safety, and emotional intelligence, can foster a collaborative and adaptable culture that facilitates effective navigation of change. In parallel, the Head domain, rooted in strategic management, ensures clarity of vision, effective resource allocation, and disciplined execution. The alignment of emotional insight with strategic intent is proposed to enhance an organization's ability to lead transformation, foster innovation, and maintain digital competitiveness in a rapidly evolving environment.

- *Hypothesis Four (Hy4): The Synergistic integration of Heart & Head domains (H4), which manifests is related to ODT success.*

This hypothesis asserts that the Heart & Hand domain's functional competencies significantly influence ODT success – effective teamwork grounded in sound judgment and decisiveness related to navigating digital transformation challenges. A positive attitude towards change and a culture of organizational learning enhances the adaptability and resilience required for ODT initiatives. Organizations that foster collaborative environments and encourage continuous learning among teams are better equipped to implement ODT projects effectively, leading to higher success rates and sustained digital growth.

- *Hypothesis Five (Hy5): The Synergistic integration of Heart & Hand domains (H3), which manifests is related to ODT success.*

This hypothesis suggests that the Head and Hand domains are closely related to ODT success. In the Head domain, strategic leadership enhances accountability and effectively

manages conflicts, providing a solid foundation for decision-making. In the Hand domain, functional expertise is crucial for maintaining data privacy and cybersecurity and securing digital processes. The alignment of strategic oversight with secure execution drives successful ODT outcomes, ensuring a robust and adaptive framework that supports digital transformation initiatives.

- *Hypothesis Six (Hy6): The Synergistic integration of Head & Hand domains (H2), which manifests is related to ODT success.*

This hypothesis proposes that the integration of the Heart, Head, and Hand domains—together with critical enablers such as top-down management commitment, a short-term win's strategy, and formal recognition mechanisms—constitutes a sufficient condition for the successful implementation of the ODT. Through top-down management commitment, the Heart domain provides direction and accountability, while short-term wins build confidence and maintain momentum. Recognition and rewards further strengthen the alignment of teams with transformation goals. The Head domain, through strategic oversight, ensures effective knowledge sharing and alignment with ODT objectives. Finally, the Hand domain focuses on execution, turning strategies into actionable results. These elements create a holistic approach that drives successful and sustainable digital transformation.

- *Hypothesis Seven (Hy7): The Synergistic integration of Heart, Head & Hand domains (H1), which manifests is related to ODT success.*

The researcher will analyze data and test hypotheses to accept or reject the null hypothesis based on statistical results. Through rigorous examination of collected data and appropriate statistical techniques, the study aims to provide conclusive insights into proposed relationships. This analysis will assess significant levels, effect sizes, and patterns, enhancing validity and the research findings' robustness.

4.7 Chapter Summary

This chapter highlights how important focus group interviews are in understanding the complex process of organizational digital transformation. The findings show that the culture within an organization plays a huge role in how it changes digitally. Successful digital transformation heavily relies on effective leadership. Leaders skilled in strategic thinking, good communication, and building stakeholder relationships are crucial for success. It's not just leadership, though. Employee engagement is also critical in making sure the transformation works well. This chapter also talks about the challenges of digital transformation, like people resisting changes, needing more knowledge about digital tools, and concerns about keeping data safe. The main point here is that digital transformation is not a one-time thing. It's a process that needs a flexible approach.

This chapter discusses these ideas and shows that digital transformation is an ongoing journey that must evolve. The researcher bases the information gathered from interviews in detail and gives a better understanding of the complex nature of digital transformation. Using what was learned from the focus group interviews, the groundwork for the next phase of research, which involves creating a measurement tool, is set up. The next chapter will focus on how the quantitative analysis is planned and done, including using surveys and checking if the hypotheses hold.

CHAPTER FIVE – QUANTITATIVE ANALYSIS OF QUESTIONNAIR SURVEY

5.1 Introduction

This chapter showed the outcomes of the second research phase: a questionnaire survey featuring 271 respondents. De Vaus (2001) highlighted the crucial role of quantitative techniques, specifically questionnaire surveys, in furnishing empirical underpinnings for social study. By spotlighting questionnaire design and development, this chapter ensured data validity and reliability, encompassing question formulation, response options, and survey length. The potency of quantitative data in illuminating trends, patterns, and critical predictors of digital transformation success is emphasized, aligning with research questions focused on success factors, challenges, and holistic management domains. This chapter culminated by elucidating insights from questions probing the necessary and sufficient conditions for a comprehensive ODT management framework amid digital transformation's organizational implementation.

5.2 Quantitative Research Implementation

5.2.1 Questionnaire Design

Designing the questionnaire for this organizational digital transformation study is paramount to acquiring precise and pertinent data that can effectively address the research inquiries. Building upon a rigorous literature synthesis, the researcher identified key themes related to ODT, encompassing critical success and failure factors, challenges, and strategic conditions. These themes were further explored and validated through focus group interviews, facilitating a deeper understanding of the nuanced dynamics influencing ODT. To ensure a robust and comprehensive foundation, insights from past research surveys were systematically analyzed and compared. Drawing from this iterative process, the questionnaire survey was meticulously developed to capture essential elements shaping

ODT, ultimately contributing to formulating a holistic and pragmatic ODT management framework. These themes encompassed:

- Organization Fundamental
- People Centric
- Strategy Formation
- Execution Management
- Competencies and Competitive Advantage

The questionnaire design is tailored to encompass these identified themes and facilitates quantitative analysis by integrating multiple-choice questions, Likert scales, and open-ended inquiries. This structured approach enabled respondents to assess the significance of diverse aspects on a scale of 1 to 5, where (1) indicates insignificance and (5) signifies utmost importance. Each item is crafted to ensure clarity, brevity, and participant comprehension while maintaining neutrality and preventing prompting toward specific responses. In the context of this investigation into an organization's digital transformation, exemplary questionnaire items are provided below:

✧ **Organization Fundamental (**Organizational culture towards digital transformation)**:** Q6 - *"There is a high level of trust between management and workers in my organization."*

✧ **People Centric** (Perceived require for digital leadership)**:** Q12 - *"Our ODT leader is a 'heart-to-heart' leader with a spirit that motivates and nurtures others to succeed in digital transformation."*

✧ **Strategy Formation** (Preferred organizational strategic management for digital transformation)**:** Q24 - *"My organization is strategic in choosing the right technology for digital transformation."*

✧ **Execution Management** (Perceived task management need for digital transformation)**:**

Q28 - *"My organization can exercise flexible measures to tackle unforeseen barriers encounters in the process its digital transformation."*

✧ **Competencies and Competitive Advantage** (Preferred organization competitive advantage for digital transformation initiatives)**:** Q26 **-** *"Our ODT team has sufficient digital skills and experience to execute our organization's digital transformation process."*

5.2.2 Sample Design and Data Collection

Quantitative research utilizes numerical data to derive insights and conclusions from research inquiries, with questionnaire surveys as a primary data collection method. These surveys consisted of structured inquiries designed to gather relevant information from a targeted sample, ensuring the acquisition of representative data (De Vaus, 2001). In this study, the researcher employed a combination of non-probability convenience and purposive sampling methods to enhance the relevance and applicability of the findings. To facilitate data collection, various administration methods were utilized, including email, WhatsApp, and Google Forms, ensuring broad accessibility and response efficiency. While online surveys have gained prominence, their suitability for older adults remains a concern. As a result, the study predominantly engaged participants under the age of 50. Additionally, this research incorporated multiple analytical techniques to systematically process and interpret the collected data, ensuring a comprehensive examination of organizational digital transformation dynamics.

The researcher also employed purposive sampling, optimizing efficiency by selecting participants aligned with research goals. This selection enhances data quality, research objectivity, and the overall robustness of findings, bolstering result reliability. All respondent data was gathered through two online questionnaire platforms and transformed into Excel. Their distribution period was from 21 December 2022 to 29 January 2023, totaling 5.5 weeks. This collected data, stored in Excel, was transferred to SPSS (Statistical Package for the

Social Sciences), widely employed in social science research for statistical analysis. SPSS offered versatile data manipulation and analysis functions, yielding descriptive statistics encompassing means, standard deviations, frequencies, and percentages.

5.2.3 Demographic and Profile Descriptive Summary

570 questionnaires distributed via different channels, 372 participants identified as males (accounting for 65.3%), while 198 identified as females (comprising 34.7%). The distribution methods employed included 136 questionnaires distributed via email and 394 through mobile social apps (WhatsApp and WeChat). Of these, 323 questionnaires were returned, indicating a response rate of 56.7%, a reasonable achievement for social research studies. A total amount of HKD16,150 donated to local charities. Ultimately, the study derived 271 valid returns (*n*), with 52 questionnaires deemed invalid for analysis. The following tables and figures illustrate the sample demographic and profile of all participated respondents. (*Table 43)* shows the gender of the sample, 166 of male (61.3%) and 105 female (38.7%), which the gender spread was align with the distributed initially.

Gender	Distribution	Counts *(n=271)*	Percent %	Cumulative %
Male	372 (65.3%)	166	61.3%	61.3%
Female	198 (34.7%)	105	38.7%	100.0 %

Table 43 (K): Frequencies of gender (n=271)

(Table 44) provides insight into the age distribution of respondents, revealing that a substantial majority, total of 28.8% were aged 36 to 44, while 28.4% were in the 45 to 52 age brackets. This demographic composition underlined the engagement of a diverse range of experienced professionals, contributing to a well-rounded perspective on the research inquiry.

Age Group	Counts *(n=271)*	Percent %	Cumulative %
22-27	12	4.4 %	4.4 %
28-35	39	14.4 %	18.8 %
36-44	78	28.8 %	47.6 %
45-52	77	28.4 %	76.0 %
53-59	31	11.4 %	87.5 %
60 or older	29	10.7 %	98.2 %
Prefer not to disclose	5	1.8 %	100.0 %

Table 44 (L): Frequencies of age group (n=271)

The data presented in (*Table 45*) illuminated the operational history of respondents' organizations. Notably, a mere 6.6% represent very new companies with an operational span of less than one year. In contrast, over 32% of organizations have established their presence for over a decade. The 1-4 years range accounts for over 26%, whereas a significant portion of 35% is attributed to companies with an operational history falling within 5-7 years and 8-10 years. This diverse distribution highlights the participation of organizations with varying experience levels, contributing to a comprehensive understanding of the research landscape.

Operating History	Counts *(n=271)*	Percent %	Cumulative %
Less than 1 year	18	6.6 %	6.6 %
1-4 years	71	26.2 %	32.8 %
5-7 years	52	19.2 %	52.0 %
8-10 years	42	15.5 %	67.5 %
over 10 years	88	32.5 %	100.0 %

Table 45 (J): Frequencies of operating history (n=271)

Table 46 provided a comprehensive overview of the occupational positions held by the respondents, categorized into two distinct groups: senior management and field staff. Participants in the senior management category include board members, C-Suite executives, General Managers, Controllers, and Executive Directors, collectively accounting for 35.9% of the total respondents. On the other hand, the remaining 64.1% of participants are

distributed across various functional levels, encompassing roles such as unit heads, IT staff, business development, sales and marketing, and other related positions. This diverse representation ensures a holistic perspective on the research topic, capturing insights from leadership and operational perspectives.

The researcher presents a comprehensive overview of the geographical distribution of respondents' organizations (*Table 47*). Particularly, the data reveals that 76% of respondents are affiliated with organizations based in Greater China, encompassing mainland China, Hong Kong, Taiwan, and Macao. Furthermore, 10% of the respondents' hail from North America, specifically the USA and Canada. A minority of organizations, constituting 14%, are in various countries, including Southeast Asia, India, Australia, Europe, and the United Kingdom. This distribution offers insights into the global representation of participants, contributing to a well-rounded perspective on the research findings' applicability across diverse geographic contexts.

Working Position	Counts *(n=271)*	Percent %	Cumulative %
Board member	14	5.2 %	5.2 %
CEO/CFO/President/Managing Director	40	14.8 %	20.0 %
General Management/Treasurer/Controller	30	11.1 %	31.1 %
CIO/Technology director/CHRO	13	4.8 %	35.9 %
Head of business unit/department	79	29.2 %	65.2 %
IT staff	8	3.0 %	68.1 %
Business/Product development staff	26	9.6 %	77.8 %
CMO, Sales and Marketing	28	10.3 %	88.1 %
Other executive focused on digital strategy	7	2.6 %	90.7 %
Others	25	9.3 %	100.0 %

Table 46 (I): Frequencies of Working Position (n=271)

Location	Counts *(n=271)*	Percent %	Cumulative %
China, HK, Taiwan, Macao	206	76.0 %	76.0 %
USA & Canada	27	10.0 %	86.0 %
Southeast Asia	16	5.9 %	91.9 %
India	10	3.7 %	95.6 %
Australia	9	3.3 %	98.9 %
Europe & UK	3	1.1 %	100.0 %

Table 47 (M): Frequencies of Company Location (n=271)

A thorough examination of the participants' industry backgrounds reveals a noteworthy diversity, encompassing pivotal sectors such as consumer goods, education, financial services, and professional services. This analysis, detailed in (*Table 48)*, underscores the considerable presence of these industries, collectively constituting more than 63% of the entire respondent pool. This distribution serves as a statistical marker and underscores the richness and varied perspectives encapsulated within the research dataset. Including participants from these sectors significantly augments the scope and profundity of insights available, enhancing the overall robustness of the research findings.

Industry	Counts *(n=271)*	Percent %	Cumulative %
Professional Service	37	13.7 %	13.7 %
Education	54	19.9 %	33.6 %
IT and Technology	18	6.6 %	40.2 %
Manufacturing	27	10.0 %	50.2 %
Financial Service	44	16.2 %	66.4 %
Health Services	9	3.3 %	69.7 %
Telecommunication/Communication	5	1.8 %	71.6 %
Consumer Goods	36	13.3 %	84.9 %
Energy and utilities	4	1.5 %	86.3 %
Entertainment	5	1.8 %	88.2 %
Media and publishing	9	3.3 %	91.5 %
Assess Mgt, Private Equity	6	2.2 %	93.7 %
Government, Public sector	2	0.8 %	94.5 %
Others	15	5.5 %	100.0 %

Table 48 (H): Frequencies of Industry Background (n=271)

An exhaustive analysis of the participants' organizational structures according to size

reveals insightful patterns. Noteworthy is the revelation that 40.6% of the surveyed organizations maintain a workforce of less than 100 full-time employees (FTEs), while another 28.8% operate within the 101-500 FTEs bracket. Moreover, an appreciable cohort, comprising 30.6% of the total respondents, represents entities boasting 501-10,000 FTEs (*Table 49)*. This distribution furnishes a nuanced portrayal of organizational dimensions and underscores the breadth of considerations within diverse scales. Including organizations across varying size categories significantly enriches the research landscape, providing a comprehensive lens through which to discern and extrapolate implications across a spectrum of organizational magnitudes.

*Table 50*a offered an intricate analysis of the organizational structure of the respondents, delineating a five-tier hierarchy marked by a prominent distribution level. The outcomes highlighted a prevailing inclination towards a more decentralized framework characterized by a streamlined organizational chart, diminished hierarchical tier, and a leaner managerial hierarchy. This structural configuration implied a shift towards collaborative decision-making methodologies involving insights from diverse stakeholders and cross-functional teams. The observable emphasis on a flatter organizational hierarchy not only mirrors contemporary organizational trends but also signifies a proclivity for cultivating collaborative and inclusive decision-making practices in alignment with current paradigms in organizational design.

Company Size (headcount) *FTEs*	**Counts** *(n=271)*	**Percent %**	**Cumulative %**
1-100	110	40.6 %	40.6 %
101-500	78	28.8 %	69.4 %
501-1000	28	10.3 %	79.7 %
1001-5000	25	9.2 %	88.9 %
5001-10000	5	1.8 %	90.8 %
More than 10000	25	9.2 %	100.0 %

Table 49: Q (F) Frequencies of Organizational Scale (n=271)

Organizational Structure	Counts *(n=271)*	Percent %	Cumulative %
Hierarchical	48	17.7 %	17.7 %
2	49	18.1 %	35.8 %
3	55	20.3 %	56.1 %
4	61	22.5 %	78.6 %
Distributed	58	21.4 %	100.0 %

Table 50a: Q (A)Frequencies of Organizational Structure (n=271)

Most survey respondents confirmed that the key operational practices and leadership capabilities for effective digital leadership, as presented in (Table 50b), include B1, B2, and B3. Respondents particularly emphasized the leader's ability to conceptualize how emerging digital technologies affect business models, adopt a "*no risk, no gain*" mindset to encourage experimentation and manage distributed teams in fast-paced environments. Notably, these results align with insights from the focus group interviews (*Appendix 7 & 9*), which further reinforced the importance of these competencies in supporting people-centred transformation and sustaining organizational agility in the digital era (Birkinshaw *et al.,* 2008; Smith & Tushman 2015). The primary objectives of Organizational Development and Transformation (ODT), as detailed in (*Table 50c*), revolve around creating business value, fostering sustainable growth, and enhancing the organization’s competitive advantage. The identified barriers to successful ODT, outlined in Table 50d, are led by the absence of an overarching strategy, followed by challenges related to poor leadership and a need for more understanding and support from management regarding the ODT initiative. The prevailing approach to ODT implementation, as indicated in (*Table 50e*), predominantly adheres to a top-down methodology, with a majority of respondents affiliating with this approach and followed by a pilot case approach and a reliance on cross-functional team for managing the ODT process.

B: Skills or abilities are most lacking in your leader? (Select up to three)	Frequency		Total
	Valid	Missing	
1) Knowing the business and being able to conceptualize how new digital technologies can impact current business processes/model	**129**	142	271
2) Willingness to experiment and take risks	**89**	182	271
3) Ability to manage or work in distributed, digital-savvy teams in fast-paced environments; flexible	**92**	179	271
4) Ability to use digital technologies like social, mobile, analytics, cloud to execute one's job	80	191	271
5) Willingness to share and be collaborative,	43	228	271
6) Talks enthusiastically about what needs to be accomplished	20	251	271
7) Considers subordinate as having different needs, abilities, and aspirations from others	85	186	271
8) Seeks differing perspectives when solving problems	72	199	271
9) Displays a sense of power and confidence,	18	253	271
10) Express their most important values and beliefs	19	252	271
11) Systematically discusses in specific terms who is responsible for achieving performance targets	49	222	271
12) Other (Please specify)	2	269	271

*Table **50**b: Q (B) Frequencies of leaders' skills or abilities require (n=271)*

E: How is your organization implementing digital transformation initiatives?	Frequency		Total
	Valid	Missing	
1) Top-down from a central senior leadership team	191	80	271
2) Use of experiments or pilots	142	129	271
3) Cross-functional team	124	147	271
4) Bottom up from business units across organization	0	271	271
5) Don't know	0	271	271
6) Other (Please specify)	0	271	271

Table 50e: Q (E) Frequencies of organization's style for ODT implementation (n=271)

C: Most important objective(s) of organisational digital strategy (Select up to 3 – three)	Frequency		Total
	Valid	Missing	
1) Create value for business	**126**	145	271
2) Improve customer experiences and engagement	103	168	271
3) Boost sustainable growth	**110**	161	271
4) Access to global markets	30	241	271
5) Increase efficiency and reduce costs	103	168	271
6) Increase innovation	30	241	271
7) Greater competitive advantage	**114**	157	271
8) Improve business decision making	25	246	271
9) Fundamentally transform business processes and/or business model	71	200	271
10) Open new opportunities for complementary investments	45	226	271
11) Others (please specify): 其他（請註明）	2	269	271

Table 50c: Q (C) Frequencies of Objectives of ODT(n=271)

D: Biggest barriers of ODT? (Select up to 3 – three)	Frequency		Total
	Valid	Missing	
1) Too many competing priorities	64	207	271
2) Lack of management understanding and supporting	**98**	173	271
3) Poor Leadership	**104**	207	271
4) Lack of overall strategy	**124**	147	271
5) Short-term market pressures	39	232	271
6) Insufficient technical skills	90	181	271
7) Security concerns	13	258	271
8) Lack of collaborative, sharing culture	32	239	271
9) Lack of entrepreneurial spirit, willingness to take risk	37	234	271
10) No strong business cases for supporting the imitative	10	261	271
11) No incentive for employees	31	240	271
12) Weak alignment of ODT strategy and organisational structure ODT	23	248	271
13) Lack of organizational agility	54	177	271
14) Ineffective communication between management and employees	33	238	271
15) Don't know	5	266	271
16) Other (Please specify)	1	270	271

Table 50d: Q (D) Frequencies of ODT barriers (n=271)

5.3 Assessing Reliability and Validity

This study's data reliability and validity assessment were examined, and the results are

summarized as follows. Analyzing the data in (*Table 51*) reveals that all correlation coefficients for the indicators exceed α ≥0.4, which suggests a moderate to solid interrelationship among the items. Additionally, the Cronbach Alpha coefficients after the deletion of individual items are consistently, was greater than α ≥0.9, indicating a high level of internal consistency. These findings collectively demonstrated that the overall reliability of the measurement is strong, and the indicators used are both consistent and robust for the intended analysis. The findings of this analysis, aligned with this criterion, affirm that all survey items were comprehensible and demonstrated commendable reliability, and the model utilized in this study stands as a robust explanatory framework, reinforces the study's credibility and affirms the soundness of the data collection instrument in elucidating the phenomena under investigation.

However, it is important to note that the specific threshold for an acceptable Cronbach's alpha may vary depending on the field or context. Therefore, it is crucial to consider the research questions and intended use of the test or scale when interpreting Cronbach's alpha values. The statistical significance of the results was also confirmed. These findings have important implications for the broader research field, as they suggest that the variables under investigation are reliable and valid measures of the constructs they are intended to represent. To enhance confidence that researcher can conclude the data and provide a solid foundation for this research. Nonetheless, the results of this study represent a significant step forward in our understanding of the variables under investigation. In conclusion, the reliability and validity of the survey data used in this study were assessed to ensure that all questions were fitting, reliable, and understandable. These findings suggest that the survey questions effectively measured the constructs of interest and can be used confidently in further analysis.

Variable	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q1	110.03	657.648	0.539	0.942
Q2	110.39	661.877	0.521	0.943
Q3	110.07	656.747	0.604	0.942
Q4	110.62	664.222	0.395	0.944
Q5	110.51	657.858	0.565	0.942
Q6	110.13	661.454	0.541	0.942
Q7	110.21	663.806	0.526	0.943
Q8	110.13	655.743	0.619	0.942
Q9	110.69	661.316	0.432	0.944
Q10	110.52	656.703	0.526	0.943
Q11	109.83	666.936	0.409	0.944
Q12	110.26	658.846	0.549	0.942
Q13	110.38	649.051	0.691	0.941
Q14	110.22	651.168	0.672	0.941
Q15	109.77	659.953	0.528	0.943
Q16	110.32	647.854	0.707	0.941
Q17	110.51	660.555	0.522	0.943
Q18	109.91	666.903	0.368	0.944
Q19	110.76	661.444	0.453	0.943
Q20	110.56	655.802	0.624	0.942
Q21	110.43	663.172	0.525	0.943
Q22	109.78	664.551	0.435	0.943
Q23	110.72	660.736	0.443	0.943
Q24	110.49	657.095	0.613	0.942
Q25	110.36	656.468	0.546	0.942
Q26	110.28	647.219	0.689	0.941
Q27	110.43	647.875	0.703	0.941
Q28	110.49	654.651	0.655	0.942
Q29	109.96	664.054	0.507	0.943
Q30	110.01	667.089	0.438	0.943
Q31	110.66	650.314	0.612	0.942
Q32	110.48	652.406	0.665	0.941
Q33	110.23	657.599	0.581	0.942
Q34	110.39	651.343	0.652	0.941
Q35	110.32	652.813	0.656	0.941

Table 51: Reliability Statistics / Itemized Summary of Total Statistics (n=271)

The reliability analysis results presented in *(Table 52)* show that the Cronbach's Alpha values for the investigated constructs (Heart, Head, Hand and their various combinations) all exceed 0.8, indicating high internal consistency and measurement stability across the

dimensions of the survey. The overall reliability value for the 30 measurement items is 0.932, indicating a relatively high level of reliability. The Hand dimension has the highest Cronbach's Alpha value (0.921), demonstrating the strongest consistency among the questionnaire items related to technical capabilities and operational execution in digital transformation, reflecting the high precision of measurements within this dimension.

Furthermore, the combined factor Heart-Head-Hand achieves a Cronbach's Alpha value of 0.941, indicating very high internal consistency and reliability for the overall model, validating the robustness and theoretical alignment of the 3H model in measuring organizational digital transformation capabilities. In comparison, the reliability of the two-dimension combinations (Heart – Hand, and Head – Hand) is relatively lower but still above 0.8, at 0.863 and 0.800 respectively, demonstrating good measurement stability in specific management practices.

Factor	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Heart (H^1) Q: 1, 3, 6, 7, 8, 12	0.885	0.885	6
Head (H^2) Q: 2, 5, 20, 21, 24, 28	0.888	0.888	6
Hand (H^3) Q: 13, 14, 16, 26, 27	0.921	0.921	5
Heart & Head (H4) Q: 11, 18, 22	0.892	0.893	3
Heart & Hand (H3) Q: 15, 29, 30	0.862	0.863	3
Head & Hand (H2) Q: 10, 17, 25	0.800	0.800	3
3H integrated (H1) Q: 4, 9, 19, 23	0.941	0.941	4
All Q1-Q35	0.932	0.932	30
ODT Q31-Q35	0.873	0.875	5

Table 52: Reliability test results

In summary, the reliability analysis results demonstrate that the survey instrument possesses a high degree of internal consistency and construct validity in measuring the integration of organizational Heart-Head-Hand capabilities, as well as the perceived effectiveness of digital transformation. These findings support the instrument's suitability for subsequent quantitative analyses and provide a robust foundation for future empirical

investigations. To enhance confidence that researchers can conclude the data and provide a solid foundation for future research. Further research may be needed to fully explore the nuances of the data and confirm the generalizability of the findings to other populations or contexts. Nonetheless, the results of this study represented a significant step forward in our understanding of the variables under investigation. In conclusion, the reliability and validity of the survey data used in this study were assessed to ensure that all questions were fitting, reliable, and understandable. These findings suggested that the survey questions effectively measured the constructs of interest and can be used confidently in further analysis.

5.4 Exploratory factor analysis

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was calculated at 0.925, substantially surpassing the recommended minimum threshold of 0.6. This high KMO value indicated that the correlations among the variables were sufficiently robust, thus justifying the application of factor analysis. The elevated KMO score further suggested a strong commonality among the questionnaire's measurement items, allowing for the efficient extraction of latent factors underlying the data structure. In this context, the KMO measure reinforced the appropriateness of the dataset for exploring the dimensionality and interrelationships of the constructs being examined.

Bartlett's test of sphericity provided additional validation, yielding a chi-square value of 6402.425 with 595 degrees of freedom and a significance level ($p < 0.001$). The highly significant result demonstrated that the correlation matrix was not an identity matrix, thus confirming the presence of meaningful correlations among the variables, as it verified that the variables shared sufficient variance to proceed with factor extraction.

These statistical indicators, high KMO value and significant Bartlett's test provided strong evidence of the data's suitability for factor analysis, affirming the validity of the constructs measured. Specifically, these results supported the robustness of the measurement model

in capturing the unique characteristics of the Heart, Head, and Hand domains. Such construct validity is crucial for the subsequent construction and validation of the factor model, ensuring that the factors identified are theoretically meaningful and empirically reliable.

The findings reinforced the sample data's applicability for multidimensional analysis, ensuring the reliability and precision of results drawn from the factor structure (*Table 53*). This establishes a sound empirical basis for further examination and validation of the relationships among the variables in future modelling efforts.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.925
Bartlett's Test of Sphericity	Approx. Chi-Square	6402.425
	df	595
	Sig.	<0.001

Table 53: KMO and Bartlett's Test of Sphericity

5.4.1 Factor Extraction results

The principal component analysis (PCA) results (*Table 54*) indicated that the eigenvalues and cumulative variance explained the significance of the primary underlying structures within the dataset. The initial eigenvalues for the first eight components were all greater than 1 (>1), collectively accounting for a cumulative variance of 73.286%. This high cumulative variance indicated that these eight components effectively explained the majority of the total variance, establishing a robust foundation for further analysis. Specifically, the first component contributed the highest variance, 35.813%, positioning it as the most influential latent factor in the data. The subsequent components demonstrated diminishing contributions to the total variance, with the second through eighth principal components (F1-F8) accounting for 9.153%, 6.197%, 5.795%, 5.083%, 4.366%, 3.670%, and 3.208%, respectively. These diminishing values suggested that each additional component had progressively less influence on the overall data structure.

Following rotation using the Varimax method, the variance contributions of these eight

components became more evenly distributed, while the cumulative explained variance remained at 73.286%. The even distribution post-rotation indicated that the Varimax rotation had optimized the loadings of each component across different variables, significantly improving the interpretability of the components. By redistributing variance more uniformly, the rotation helped ensure that each component represented distinct underlying structures or measurement dimensions more clearly, thus enhancing the clarity of the factors and their role in the data. This analysis demonstrated the inherent complexity of the dataset's structure. The extraction of the first eight components captured the dominant characteristics within the data, providing strong empirical evidence to understand the different dimensions within the 3H model framework. Additionally, the PCA, particularly after rotation, offered an efficient method for dimensionality reduction, allowing for a clearer interpretation of the interrelationships among the variables. This analysis laid a solid empirical foundation for understanding the multi-dimensional nature of enterprises, particularly within the domains addressed by the Heart, Head, and Hand constructs, and for further exploration of the data's underlying structures.

Based on the rotated factor loading matrix presented in (Table 55), the factor loadings of each questionnaire item (Q1 to Q35) across the eight principal components (F1 to F8) were identifiable. The factor loading coefficients indicated the strength of the correlation between each item and its corresponding component, with higher values reflecting greater explanatory power within the factor structure. All loading coefficients for the identified dimensions exceeded the threshold of 0.5, suggesting that the factor groupings were well-defined, and the constructs measured were distinct and interpretable (Hair *et al.,* 2014).

These findings provide empirical support for the theoretical framework underpinning the questionnaire, which is grounded in digital leadership competency models emphasizing the need for technological acumen, adaptability, and strategic risk-taking (Kane *et al.,* 2015; Foss & Saebi, 2017). The emergence of eight distinct factors aligns with the

conceptualization of digital leadership as a multidimensional construct encompassing competencies such as digital strategy, innovation, people-centric transformation, and operational agility (Avolio *et al.,* 2000; El Sawy *et al.,* 2003).

Moreover, the results align with the principles of Exploratory Factor Analysis (EFA) best practices, which suggest retaining factors with eigenvalues greater than 1.0 and ensuring meaningful loadings above 0.5 (Tabachnick *et al.,* 2013). No significant cross-loadings or ambiguities were detected, further confirming the scale's factorial validity. This evidence collectively supports the questionnaire's theoretical foundation and affirms that the proposed model accurately captures the dimensions essential for understanding effective digital leadership in contemporary organizational contexts.

Component (Question)	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	12.534	35.813	35.813	12.534	35.813	35.813	4.113	11.751	11.751
2	3.204	9.153	44.966	3.204	9.153	44.966	3.924	11.211	22.961
3	2.169	6.197	51.163	2.169	6.197	51.163	3.549	10.141	33.102
4	2.028	5.795	56.958	2.028	5.795	56.958	3.463	9.895	42.997
5	1.779	5.083	62.042	1.779	5.083	62.042	3.305	9.442	52.439
6	1.528	4.366	66.408	1.528	4.366	66.408	2.596	7.417	59.856
7	1.284	3.67	70.077	1.284	3.67	70.077	2.480	7.087	66.943
8	1.123	3.208	73.286	1.123	3.208	73.286	2.220	6.343	73.286
9	0.670	1.915	75.201						
10	0.613	1.751	76.952						
11	0.603	1.724	78.676						
12	0.578	1.651	80.326						
13	0.532	1.519	81.846						
14	0.460	1.313	83.159						
15	0.436	1.247	84.405						
16	0.422	1.205	85.61						
17	0.419	1.198	86.808						
18	0.398	1.137	87.945						
19	0.386	1.103	89.048						
20	0.363	1.038	90.085						
21	0.338	0.966	91.051						
22	0.317	0.905	91.956						
23	0.313	0.893	92.85						
24	0.309	0.883	93.733						
25	0.260	0.744	94.477						
26	0.256	0.731	95.208						
27	0.243	0.694	95.902						
28	0.227	0.648	96.549						
29	0.212	0.606	97.155						
30	0.208	0.594	97.749						
31	0.185	0.53	98.279						
32	0.174	0.498	98.777						
33	0.161	0.459	99.236						
34	0.152	0.433	99.669						
35	0.116	0.331	100						

Table 54: Factor extraction results

	F1	F2	F3	F4	F5	F6	F7	F8
Q1	0.804							
Q3	0.718							
Q6	0.693							
Q7	0.740							
Q8	0.705							
Q12	0.720							
Q2		0.755						
Q5		0.680						
Q20		0.661						
Q21		0.772						
Q24		0.734						
Q28		0.715						
Q4			0.879					
Q9			0.893					
Q19			0.891					
Q23			0.919					
Q13				0.785				
Q14				0.727				
Q16				0.699				
Q26				0.728				
Q27				0.688				
Q31					0.627			
Q32					0.754			
Q33					0.665			
Q34					0.708			
Q35					0.694			
Q11						0.860		
Q18						0.875		
Q22						0.875		
Q15							0.791	
Q29							0.806	
Q30							0.845	
Q10								0.783
Q17								0.699
Q25								0.757

Table 55: Rotated matrix of factor loading coefificients

The commonalities presented in (*Table 56*) represent the proportion of variance in each questionnaire item accounted for by the factor structure derived from the analysis. Higher communality values indicate that the respective variables exhibit strong explanatory power within the extracted factor model. The study revealed that the majority of items demonstrated commonalities values near or exceeding 0.7, signifying that these items are well-represented by the factor solution. These findings reinforce the stability of the factor structure and provide evidence of the measurement validity of the identified constructs.

Heart (H¹)	Extraction	Head (H²)	Extraction	Hand (H³)	Extraction	Heart & Head (H4)	Extraction
Q1	0.729	**Q2**	0.687	**Q13**	0.821	**Q11**	0.810
Q3	0.659	**Q5**	0.649	**Q14**	0.746	**Q18**	0.825
Q6	0.580	**Q20**	0.658	**Q16**	0.754	**Q22**	0.842
Q7	0.667	**Q21**	0.688	**Q26**	0.766		
Q8	0.651	**Q24**	0.699	**Q27**	0.762		
Q12	0.644	**Q28**	0.702				
Heart & Hand (H3)	Extraction	Head & Hand (H2)	Extraction	3H (H1)	Extraction	ODT	Extraction
Q15	0.773	**Q10**	0.752	**Q4**	0.814	**Q31**	0.610
Q29	0.775	**Q17**	0.645	**Q9**	0.852	**Q32**	0.769
Q30	0.796	**Q25**	0.726	**Q19**	0.850	**Q33**	0.623
				Q23	0.893	**Q34**	0.705
						Q35	0.736

Table 56: The Factors Communalities analysis results

The scree plot (*Figure 57*) is utilized in factor analysis or principal component analysis to determine the number of factors to retain. From the plot, it is evident that the eigenvalues of the first eight components are significantly higher than those of the remaining components, indicating that these eight components possess the strongest explanatory power regarding the total variance in the data. This visual representation supports the decision to retain these eight components for further analysis.

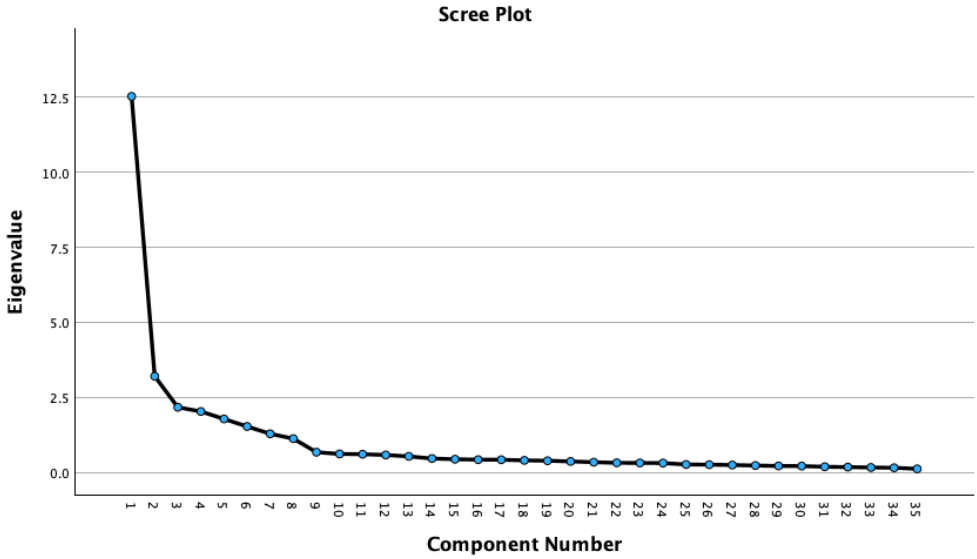

Figure 57: Scree Plot for PCA Explained

5.4.2 Confirmatory factor analysis

The objective of the Confirmatory Factor Analysis (CFA) in this research is to validate the

underlying structure of the proposed theoretical model by testing how well the measured variables represent the identified latent constructs. This method helps confirm the reliability and validity of the constructs under study, such as leadership attributes or digital transformation outcomes. By doing so, the research strengthens its theoretical foundation and provides empirical support for the relationships between the identified variables.

Factor	item	Coef.	Std. Error	z	p	Std. Estimate
Heart (H^1)	Q1	1	-	-	-	0.783
	Q3	0.925	0.068	13.595	<0.001	0.787
	Q6	0.796	0.068	11.689	<0.001	0.692
	Q7	0.810	0.064	12.604	<0.001	0.738
	Q8	0.906	0.069	13.221	<0.001	0.769
	Q12	0.886	0.071	12.402	<0.001	0.728
Head (H^2)	Q2	1	-	-	-	0.718
	Q5	1.062	0.092	11.556	<0.001	0.738
	Q20	1.054	0.088	11.938	<0.001	0.762
	Q21	0.948	0.085	11.191	<0.001	0.714
	Q24	1.051	0.087	12.082	<0.001	0.772
	Q28	1.121	0.088	12.803	<0.001	0.819
Hand (H^3)	Q13	1	-	-	-	0.865
	Q14	0.935	0.054	17.347	<0.001	0.825
	Q16	0.951	0.055	17.150	<0.001	0.820
	Q26	1.007	0.057	17.754	<0.001	0.836
	Q27	0.979	0.055	17.851	<0.001	0.839
Heart & Head (H4)	Q11	1	-	-	-	0.849
	Q18	1.082	0.066	16.294	<0.001	0.837
	Q22	1.068	0.062	17.263	<0.001	0.887
Heart & Hand (H3)	Q15	1	-	-	-	0.848
	Q29	0.887	0.061	14.587	<0.001	0.816
	Q30	0.906	0.063	14.378	<0.001	0.804
Head & Hand (H2)	Q10	1	-	-	-	0.795
	Q17	0.791	0.073	10.772	<0.001	0.692
	Q25	0.965	0.080	12.008	<0.001	0.791
3H integrated (H1)	Q4	1	-	-	-	0.854
	Q9	1.06	0.052	20.318	<0.001	0.901
	Q19	0.991	0.051	19.533	<0.001	0.882
	Q23	1.105	0.051	21.909	<0.001	0.938
ODT	Q31	1	-	-	-	0.690
	Q32	1.055	0.086	12.220	<0.001	0.823
	Q33	0.926	0.085	10.889	<0.001	0.723
	Q34	1.030	0.089	11.532	<0.001	0.771
	Q35	1.058	0.087	12.215	<0.001	0.823

Table58: Results of factor loading coefficients for CFA analysis

According to the results of the Confirmatory Factor Analysis (CFA) presented in (*Table 58*), the factor loading coefficients and standardized estimates for each factor indicate the strength of the association between the measurement items and their corresponding factors. Overall, all factor loadings are significant ($p < 0.001$), demonstrating that each measurement

item possesses a high degree of explanatory power for its respective factors. This strong relationship enhances the validity of the model and affirms the relevance of the measurement items in capturing the underlying constructs of the Heart-Head-Hand framework.

The Heart (H^1) domain factor comprises six items: Q1, Q3, Q6, Q7, Q8, and Q12, with standardized factor loadings ranging from 0.692 to 0.787. This range indicates a balanced contribution of these items to the Heart factor. The highest standardized estimate is found in Q1 (0.783), while the lowest is in Q6 (0.692). This suggests that aspects such as leadership style, communication, and emotional support effectively capture the essence of the Heart domain.

The Head (H^2) domain factor consists of six items: Q2, Q5, Q20, Q21, Q24, and Q28, with standardized factor loadings between 0.714 and 0.819, reflecting good model fit. Among these, Q28 has the highest standardized estimate (0.819), indicating that strategic management and the implementation of digital strategies play a dominant role in measuring the Head dimension. Although Q21 has a relatively lower loading (0.714), it still signifies its importance within the Head dimension.

The Hand (H^3) domain includes five items: Q13, Q14, Q16, Q26, and Q27, with all standardized estimates exceeding 0.8. Notably, Q27 (0.839) and Q13 (0.865) exhibit particularly high factor loadings. This indicates that the "Hand" dimension demonstrates very high internal consistency in measuring technical capabilities, team execution, and process management. Overall, the results affirm that the measurement items are effective in capturing the constructs of each dimension, contributing to the overall validity of the CFA model.

The Heart & Head (H4) combined factor is defined by Q11, Q18, and Q22, with standardized factor loadings ranging from 0.837 to 0.887. This range indicates a strong and consistent

contribution of these items to the construct, providing empirical support for the H4 factor's ability to effectively represent the dynamic interplay between the Heart and Head dimensions. Among the three items, Q22 demonstrated the highest standardized factor loading (0.887), indicating its significant contribution to the overall construct. This result highlighted the prominent role of the interaction between emotional leadership and strategic implementation within the "Heart & Head" dimension. Specifically, the high factor loading of Q22 suggested that the alignment of emotional intelligence in leadership with the effective execution of strategic goals is a central element in capturing the essence of this combined factor. These findings reinforced the importance of Q22 in modelling the interplay between the emotional and cognitive aspects that underpin the H4 construct.

The Heart & Hand (H3) combined factor consists of three items: Q15, Q29, and Q30, with standardized estimates of 0.848, 0.816, and 0.804, respectively. Q15 served a core role in this combined factor (0.848), indicating that the integration of emotional support and technical execution provides the strongest explanatory power for the "Heart & Hand" dimension.

The Head & Hand (H2) combined factor included three items: Q10, Q17, and Q25, with standardized estimates ranging from 0.692 to 0.795. This suggested that the factor captures the combined characteristics of the Head and Hand dimensions effectively. Within this factor, Q10 has the highest loading (0.795), indicating that the integration of strategic execution and technical capabilities is particularly significant in the Head & Hand dimension.

The 3H Integrated (H1) comprehensive factor was represented by four items: Q4, Q9, Q19, and Q23, with standardized factor loadings ranging from 0.854 to 0.938, indicating exceptionally strong loadings. These results suggested that integrating the three dimensions; Heart, Head, and Hand demonstrated a high degree of explanatory power in assessing overall organizational change and leadership effectiveness. Among these, Q23 exhibited

the highest loading (0.938), highlighting the pivotal role of knowledge sharing and management commitment within this dimension. Collectively, these findings underscored the strong interrelationships among the combined factors and their capacity to capture the complexities of organizational dynamics and leadership efficacy. The results of the confirmatory factor analysis (CFA) were illustrated in *Figures 15* (CFA framework), *Figure 16* (CFA Unstandardized Estimates Result Diagram), and *Figure 17* (CFA Standardized Estimates Result Diagram)

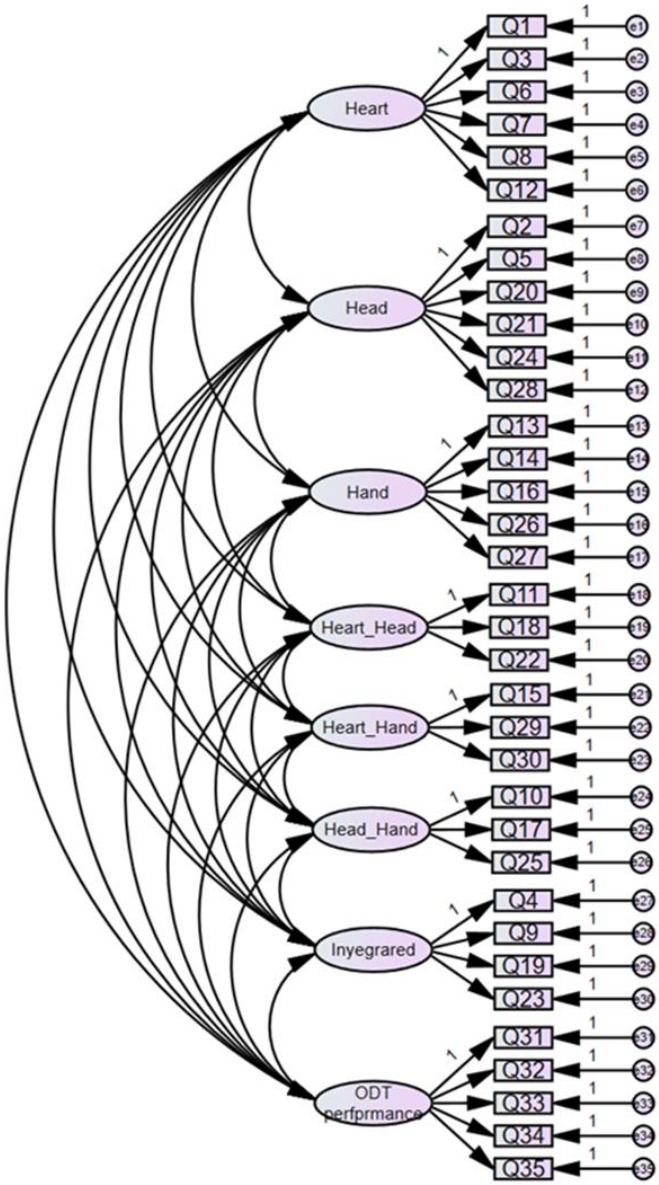

Figure 15: CFA framework Diagram

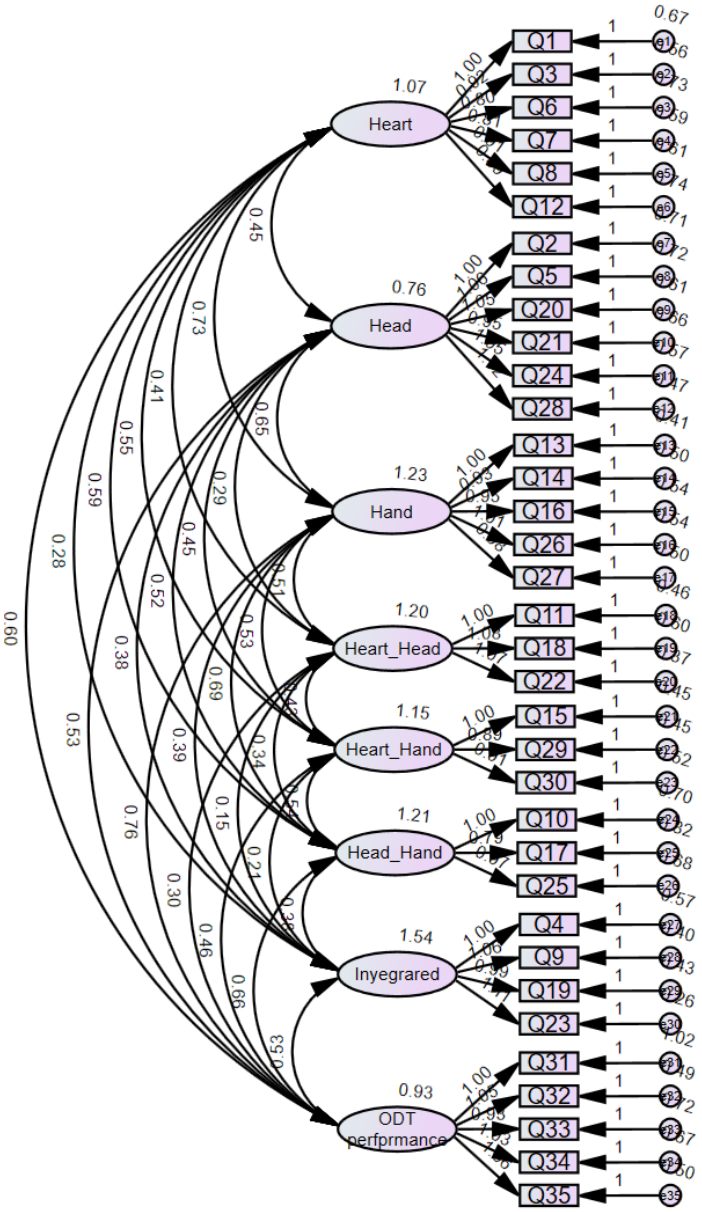

Figure 16: CFA Unstandardized Estimates Result Diagram

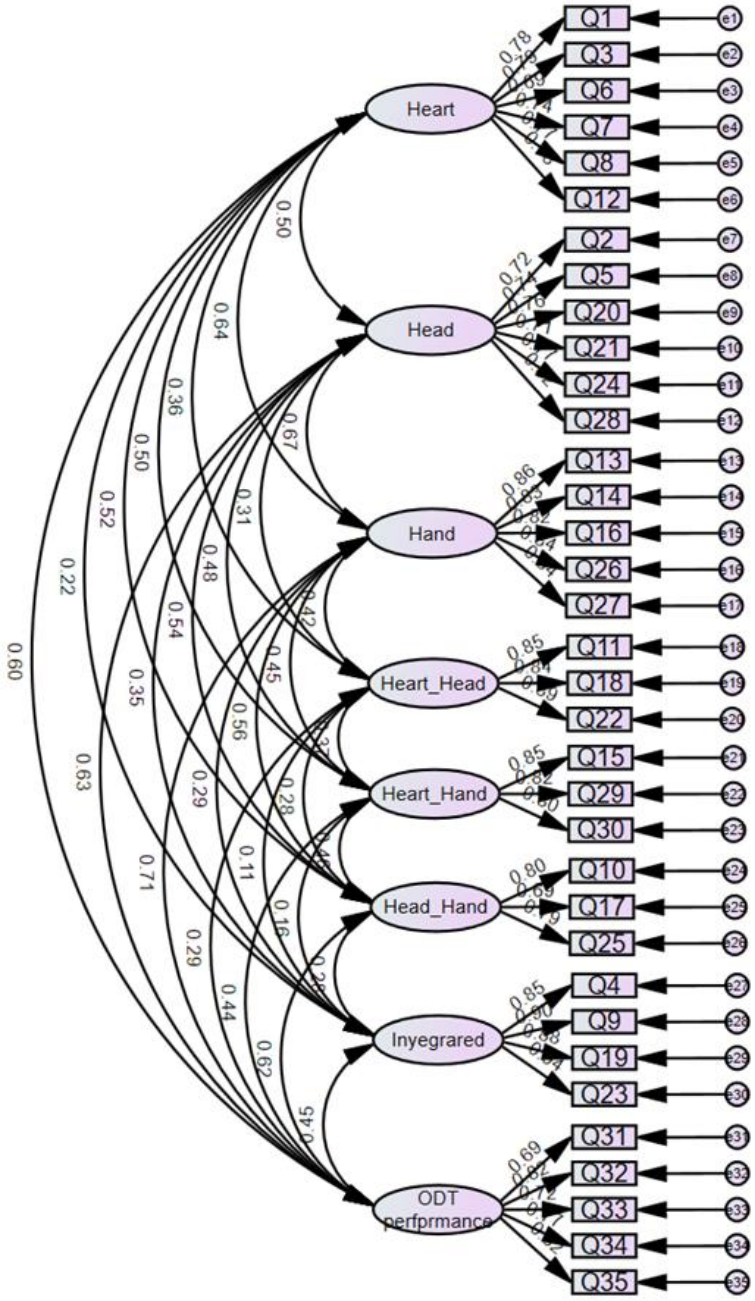

Figure 17: CFA Standardized Estimates Result Diagram

5.4.3 Pearson Correlation Coefficients

All factors exhibit Average Variance Extracted (AVE) and Composite Reliability (CR) values exceeding conventional thresholds (AVE > 0.5, CR > 0.8), indicated that the model's latent factors possess strong convergent validity and reliability (*Table 59*). This supports the stability and effectiveness of the measurement model. Notably, the "Hand", “Heart & Head” and "3H integrated" factors have the highest AVE and CR values, suggesting that they demonstrate greater explanatory power and consistency in measuring organizational technical capabilities and the integration efficacy of the three management domains. This reinforces the model's robustness in capturing the essential constructs related to organizational performance and leadership effectiveness.

Factor	AVE	CR
Heart (H^1)	0.563	0.885
Head (H^2)	0.570	0.888
Hand (H^3)	0.701	0.921
Heart & Head (H4)	0.736	0.893
Heart & Hand (H3)	0.677	0.863
Head & Hand (H2)	0.578	0.804
3H integrated (H1)	0.802	0.941
ODT	0.589	0.877

Table 59: Modelled AVE and CR indicator results

Table 60 presents the Pearson correlation coefficients, and the square roots of the Average Variance Extracted (AVE) for the constructs of the 3H framework (Heart, Head, Hand, and their combinations), as well as the Overall Digital Transformation (ODT) variable. The diagonal values, presented in bold, reflect the square roots of the AVE for each construct, while the off-diagonal elements represent the bivariate Pearson correlation coefficients between the respective constructs. Discriminate validity is supported when the square root of each construct's AVE exceeds its correlations with other constructs (Fornell & Larcker, 1981). The result shows that all AVE square root values (ranging from 0.750 to 0.894) are higher than any of the corresponding inter-construct correlations. It confirms that each latent

construct captures a unique aspect of the 3H model, with sufficient discriminant validity, and that there is no evidence of multicollinearity or overlapping constructs compromising the measurement model.

	Heart (H^1)	Head (H^2)	Hand (H^3)	Heart & Head (H4)	Heart & Hand (H3)	Head & Hand (H2)	3H integrated (H1)	ODT
Heart (H^1)	**0.750**							
Head (H^2)	0.504	**0.755**						
Hand (H^3)	0.639	0.672	**0.837**					
Heart & Head (H4)	0.362	0.306	0.418	**0.858**				
Heart & Hand (H3)	0.498	0.483	0.448	0.366	**0.823**			
Head & Hand (H2)	0.521	0.541	0.562	0.285	0.458	**0.760**		
3H integrated (H1)	0.220	0.348	0.287	0.107	0.160	0.280	**0.894**	
ODT	0.603	0.627	0.711	0.286	0.444	0.622	0.447	**0.768**

Table 60: Distinguishing validity: Pearson's correlation and AVE square root values

The basic factors – Heart (H^1), Head (H^2), and Hand (H^3); demonstrated moderate to strong positive correlations with each other (r = 0.504 to 0.672), reflecting theoretical consistency with the 3H framework, which suggests these competencies are complementary dimensions of effective leadership and action in digital contexts. Interestingly, the hybrid constructs (Heart & Head, Heart & Hand, Head & Hand) showed comparatively lower correlations with the basic factors (r = 0.306 to 0.562), which indicates that while these combined constructs are derived from the basic elements, they function as distinct, higher-order integrations rather than direct extensions of the individual factors. That suggests hybrid competencies may emerge in specific contexts where combined cognitive, emotional, and behavioral responses are required rather than consistently present alongside essential competencies.

The 3H integrated construct (H1) displayed the highest AVE square root value (0.894), indicating strong internal consistency and reliability. However, its correlations with other factors were generally lower (r = 0.107 to 0.348) except for a moderate association with ODT (r = 0.447). While the integrated constructs are psychometrically sound, their activation may be less directly related to the basic and hybrid constructs in isolation, and that may function

as a unique, higher-level competency in specific leadership or organizational scenarios. However, the core competencies showed stronger correlations with ODT than the hybrid and integrated constructs. Specifically, the Hand (H^3) exhibited the highest correlation with ODT (r = 0.711), followed by the Head (H^2, r = 0.627) and Heart (H^1, r = 0.603). These findings imply that practical execution capabilities (Hand) are the most influential factors driving successful digital transformation, supporting prior research that emphasizes the critical role of operational agility and implementation in transformation processes (Kane *et al.,* 2015).

In contrast, the hybrid constructs exhibited weaker relationships with ODT (r = 0.286 to 0.622), and the integrated 3H factor showed only a moderate correlation (r = 0.447). This pattern suggests that while integrated leadership competencies are theoretically valuable, ODT may rely more on direct, action-oriented competencies than complex, multidimensional integrations. These results support the theoretical assumptions of the 3H framework. While the framework posits that the integration of Heart, Head, and Hand is essential for optimal leadership and transformation, the empirical evidence from this analysis suggests that basic competencies, particularly Hand, are more strongly associated with digital transformation outcomes. That may reflect contextual realities where digital initiatives prioritize execution and delivery over more nuanced, integrative leadership behaviors, especially in fast-paced, high-stakes environments.

For practitioners, these findings highlight the importance of reinforcing basic operational competencies during digital transformation efforts while recognizing that higher-order integrative competencies may play a secondary role in immediate transformation outcomes, although essential for long-term strategic success. Organizations may benefit from prioritizing execution capacity (Hand) while progressively fostering integrated leadership development.

Table 61 outlines the fit indices of the model and compares them against strict and general standards to assess the overall model fit. The primary fit indices include the Chi-square to degrees of freedom ratio (CMIN/DF), Standardized Root Mean Square Residual (SRMR), Goodness-of-Fit Index (GFI), Adjusted Goodness-of-Fit Index (AGFI), Normed Fit Index (NFI), Incremental Fit Index (IFI), Tucker-Lewis Index (TLI), Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA).

From the results, the CMIN/DF value is 1.396, significantly lower than the strict standard (<3), indicating a good overall fit of the model. The SRMR value is 0.041, which is below the acceptable threshold of 0.1, suggesting that the model has small residuals, and that the measurement error is within an acceptable range. Regarding the goodness-of-fit indices, the GFI is 0.864 and the AGFI is 0.839. While these do not meet the strict standard (>0.9), they comply with the general standard (>0.8), indicating an acceptable overall structural fit of the model. Other indices such as NFI (0.889), RFI (0.876), and IFI (0.966) are close to or exceed the strict standard, demonstrating a high level of correspondence between the data and theoretical structure.

Notably, the CFI and TLI values are 0.966 and 0.962, respectively, both well above the conventional threshold of 0.90, indicating a strong model fit to the observed data. Furthermore, the RMSEA value of 0.038 falls well within the acceptable range and below the 0.05 benchmark. According to Fabrigar *et al.* (1999), an RMSEA value of 0.05 or lower reflects a good fit, while values up to 0.08 are still considered acceptable. Therefore, the low RMSEA value in this study suggests minimal approximation error in parameter estimates

Model	CMIN/DF	SRMR	GFI	AGFI	NFI	RFI	RFI	IFI	TLI	CFI	RMSEA
Default model	1.396	0.041	0.864	0.839	0.889	0.876	0.876	0.966	0.962	0.966	0.038
Strict standard	<3	<0.1	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	<0.10
General standard	<5	<0.1	>0.8	>0.8	>0.8	>0.8	>0.8	>0.8	>0.8	>0.8	<0.10

Table 61: Thresholds for good & acceptable fit

and further supports the model's overall adequacy. Collectively, these fit indices demonstrate strong model performance, providing empirical support for the validity of the proposed theoretical constructs.

5.4.4 Correlation test

Most factors exhibited mean scores ranging from 3.0 to 3.7, indicating that the average scores on the scales were moderate to high. These results suggested that the surveyed organizations generally demonstrated balanced performance across various dimensions, including leadership effectiveness (Heart), strategizing and organizing capabilities (Head), and technical and operational competencies (Hand), that reflected a certain level of management competency in these areas.

Specifically, the highest mean scores were observed for the Heart & Head (H4) factor (Mean = 3.722) and the Heart & Hand (H3) factor (Mean = 3.637). These findings indicated that the integration of emotional leadership with strategic management, as well as the combination of emotional support with execution capabilities, was relatively prominent within the surveyed organizations. In contrast, the mean score for organizational digital transformation performance (ODT) was 3.137, with a median of 3.000, suggesting that the overall performance of most companies in their digital transformation efforts remained at a moderate level. These results highlighted the potential for improvement in achieving greater effectiveness in digital initiatives.

Skewness and kurtosis were employed to evaluate the symmetry and peakedness of the data distributions. Most factors demonstrated negative skewness values, ranging from 0.813 to -0.061, indicating left-skewed distributions. This suggests that, for most variables, scores were concentrated slightly above the median, reflecting a tendency toward higher responses. These results suggested that the surveyed organizations performed better than average across these dimensions, particularly in the Heart & Head dimension, which had a skewness

of -0.813, which pronounced left skewness indicated that many organizations scored notably high in the integration of emotional leadership and strategic management.

In contrast, the 3H Integrated (H1) domain exhibited a positive skewness of 0.112, indicating a slight right skew, which suggested that, in some cases, organizations had relatively lower scores in the integration of the Heart, Head, and Hand domains. Such a distribution implied that while many organizations demonstrated strong integration of emotional support, strategic management, and technical execution, there was a subset of organizations with comparatively weaker performance in combining these dimensions effectively. This variability in scores could reflect differences in how healthy organizations integrated these key elements, potentially influencing their overall leadership and operational effectiveness.

Table 62 presents the Pearson correlation coefficient matrix of core variables, analyzing the relationships between various latent factors and ODT performance, as well as their association strength in the model. Overall, all factors demonstrate significant correlations with ODT ($p < 0.01$), indicating that the "Heart, Head and Hand" domains and their combinations have a strong influence on driving organizational digital transformation performance.

	Mean	Median	Std. Deviation	Skewness	Kurtosis	Min	Max
Heart (H^1)	3.415	3.500	0.976	-0.390	-0.862	1.167	5.000
Head (H^2)	3.073	3.000	0.965	-0.061	-0.921	1.000	4.833
Hand (H^3)	3.232	3.200	1.128	-0.428	-0.798	1.000	4.800
Heart & Head (H4)	**3.722**	4.000	1.220	**-0.813**	-0.625	1.000	5.000
Heart & Hand (H3)	**3.637**	3.667	1.076	-0.505	-0.836	1.000	5.000
Head & Hand (H2)	3.092	3.000	1.125	-0.076	-1.018	1.000	5.000
3H integrated (H1)	2.856	2.750	1.330	0.112	-1.366	1.000	5.000
ODT	3.137	3.000	1.044	-0.251	-0.848	1.000	4.800

Table 62: Descriptive statistics for core variables

Based on the results of the Pearson correlation analysis (*Table 63*), the Hand (H^3) domain showed the highest correlation with organizational digital transformation (ODT) performance ($r = 0.649^{**}$, $p < 0.01$), highlighting those improvements in technical capability and execution had the most direct impact on enhancing digital transformation outcomes. The Head (H^2) domain followed with a correlation of 0.555^{**} ($p < 0.01$), indicating that strategic management also played a crucial role in the digital transformation process. The Heart (H^1) domain, with a correlation of 0.532^{**} ($p < 0.01$), demonstrated that leadership strategies and emotional support were crucial in driving digital transformation. However, their effect was slightly less pronounced than that of the "Hand" domain. These results suggested a hierarchical influence where technical execution is the most significant driver of digital transformation, followed by strategic management and emotional leadership, emphasizing the need for organizations to develop competencies across all three dimensions for effective transformation.

Regarding the correlations between various composite factors, such as Heart & Head (H4), Heart & Hand (H3), and organizational digital transformation performance (ODT), the Heart & Hand (H3) domain exhibited a relatively high correlation with ODT ($r = 0.387^{**}$, $p < 0.01$), indicating that the integration of emotional support and technical execution significantly contributed to organizational performance. In contrast, the correlation coefficients for the Heart & Head (H4) and Head & Hand (H2) domains with ODT were 0.266 and 0.538, respectively. The notable correlation ($r = 0.538^{**}$, $p < 0.01$) between the Head & Hand (H2) domain—representing the integration of strategic management and technical execution and ODT highlighted the critical importance of effectively combining strategy formulation and technical execution to enhance organizational performance. It is worth noting that the correlation coefficient between the 3H Integrated composite factor and ODT ($r = 0.404^{**}$) was significant but lower than that of the individual "Hand" dimension, which suggested that while the integration of the three H domains, Heart, Head, and Hand could lead to overall

performance improvements, its complexity and the challenges of implementation may result in a less direct impact on organizational performance compared to the enhancement of singular technical capabilities. Consequently, organizations undergoing digital digital transformation may prioritize the development of technical execution capabilities before gradually working toward integrating all three domains.

The standard approach of incorporating multiplicative interaction terms in regression analysis was not employed in this study. Instead, the researcher developed dedicated composite scales to measure the combined effects of the Heart, Head, and Hand domains. This decision was based on the conceptual positioning of these domains as inherently integrated constructs rather than discrete variables with statistically interactive properties. The use of dedicated scales allowed for the representation of holistic managerial dispositions, aligning more closely with the theoretical framework underpinning the study. Additionally, this approach helped mitigate potential issues commonly associated with interaction terms, such as artificial multicollinearity and reduced interpretability of model outputs (Edwards, 2001). While this method limited the ability to isolate individual interaction effects, it offered enhanced construct validity by capturing the joint influence of the domains in a manner consistent with their theoretical integration.

	ODT	Heart (H^1)	Head (H^2)	Hand (H^3)	Heart & Head (H4)	Heart & Hand (H3)	Head & Hand (H2)	3H integrated (H1)
ODT	1							
Heart (H^1)	0.532**	1						
Head (H^2)	0.555**	0.444**	1					
Hand (H^3)	0.649**	0.582**	0.608**	1				
Heart & Head (H4)	0.266**	0.323**	0.260**	0.379**	1			
Heart & Hand (H3)	0.387**	0.435**	0.412**	0.400**	0.320**	1		
Head & Hand (H2)	0.538**	0.445**	0.458**	0.492**	0.247**	0.384**	1	
3H integrated (H1)	0.404**	0.205**	0.307**	0.267**	0.095	0.143*	0.250**	1

*Table 63: Pearson correlation matrix - * p<0.05 ** p<0.01*

5.5 Single Hierarchical Regression (SHR)

A Single Hierarchical Regression Analysis was conducted to assess the impact of control variables, including company size, geographic location, company history, career length, and gender, on Overall Digital Transformation performance. As presented in *Table 64*, the results indicate that the model explained 37.6% of the variance in ODT performance (adjusted R^2 = 0.376). The F-value (F = 8.063, p = 0.000) confirmed that the model demonstrated a statistically significant fit.

- **Effect of Company Size on ODT Performance**

Company size was a significant predictor of ODT success. Organizations with 1001–5000 employees had a standardized regression coefficient of β = 0.856 (p = 0.000), and those with more than 5000 employees had a coefficient of β = 1.046 (p = 0.000), indicating significantly higher ODT performance compared to the reference group of small enterprises (1–100 employees).

- **Impact of Work Experience on ODT Performance**

Work experience showed a significant positive association with ODT success. Employees with 8–10 years of experience had a standardized regression coefficient of β = 0.876 (p = 0.004), while those with over 10 years of experience had a coefficient of β = 1.133 (p = 0.000), indicating statistically significant contributions to ODT performance.

- **Influence of Age on ODT Performance**

Age was a significant determinant of ODT success. Compared to the reference group of employees aged 22–27, all other age groups showed significant positive effects on ODT performance: 28–35 years (β = 0.770, p = 0.000), 36–44 years (β = 1.167, p = 0.000), 45–52 years (β = 0.904, p = 0.000), 53–59 years (β = 0.710, p = 0.002), and 60 years or older (β = 0.923, p = 0.000). The 36–44 age group had the highest coefficient (β = 1.167).

	Unstandardized Coefficients	Std. Error	Beta ·	t	p
Constant	1.542	0.356	-	4.337	0.000**
Size of company:					
101-500	0.095	0.149	0.038	0.639	0.523
501-1000	-0.051	0.210	-0.013	-0.242	0.809
10001-5000	0.856	0.172	0.308	4.973	0.000**
=>5000	1.046	0.213	0.404	4.907	0.000**
History:					
1-4 years	-0.286	0.352	-0.078	-0.813	0.417
5-9 years	-0.367	0.331	-0.127	-1.108	0.269
10-50 years	-0.596	0.327	-0.284	-1.822	0.070
≥ 50 years	-0.741	0.390	-0.264	-1.897	0.059
Job History:					
1-4 years	0.587	0.285	0.227	2.059	0.041*
5-7 years	0.497	0.291	0.174	1.707	0.089
8-10 years	0.876	0.302	0.275	2.90	0.004**
over 10 years	1.133	0.288	0.543	3.937	0.000**
Gender (female)	0.123	0.113	0.057	1.092	0.276
Age:					
28-35	0.770	0.212	0.248	3.634	0.000**
36-44	1.167	0.195	0.497	5.991	0.000**
45-52	0.904	0.198	0.390	4.564	0.000**
53-59	0.710	0.230	0.217	3.088	0.002**
60 or older	0.923	0.241	0.265	3.823	0.000**
Location:					
USA & Canada	-0.04	0.169	-0.014	-0.236	0.813
Southeast Asia (Singapore, Malaysia, Philippines, Thailand, Vietnam, Indonesia)	0.015	0.182	0.004	0.083	0.934
India	0.245	0.252	0.055	0.974	0.331
Australia	0.220	0.260	0.045	0.846	0.399
Europe & United Kingdom	0.352	0.345	0.054	1.019	0.309
R^2 ·			0.429		
Adj R^2 ·			0.376		
F ·			F (23,247)=8.063,p=0.000		
D-W			1.625		

*Table 64: Regression results with control variables included - * p<0.05 ** p<0.01*

- **Regression Results Including Control and Core variables**

Table 65 presents the regression analysis results incorporating both control variables and core variables, revealing the effects of the key factors: Heart, Head, and Hand, on Organizational Digital Transformation (ODT) performance. The regression model yielded an adjusted R^2 of 0.597, indicating that the combination of core and control variables explained 59.7% of the variance in ODT performance. The overall model fit was statistically significant,

with an F-value of 16.355 and a *p*-value of 0.000, confirming a good model fit.

Specifically, the Heart domain demonstrated a regression coefficient of 0.142, with a standardized coefficient (Beta) of 0.131 and a *p*-value of 0.010 ($p < 0.05$), indicating a significant positive effect on ODT performance. Although the effect size of the Heart factor was relatively modest ($\beta = 0.131$), the results suggest that “soft” elements such as emotional support, leadership communication, and a culture of trust play an essential role in motivating employee engagement and sustaining momentum throughout the digital transformation process. This influence is particularly critical in the early stages of transformation, where emotional support can effectively reduce employee resistance and enhance team cohesion, thereby facilitating the smoother implementation of digital initiatives.

The Head domain produced a regression coefficient of 0.202, with a standardized coefficient (Beta) of 0.187 and a *p*-value of 0.000 ($p < 0.001$), indicating a statistically significant positive effect on ODT performance, which is stronger than the effect of the Heart factor. This result suggests that strategic management and decision-making capabilities are more critical in driving overall performance during digital transformation. Effective strategic planning, resource allocation, and performance monitoring ensure that the transformation process maintains clear direction and sustainability, thereby enhancing the organization's capacity to manage complex changes and improving overall execution outcomes.

The Hand domain demonstrated the strongest effect among the core variables, with a regression coefficient of 0.281, a standardized coefficient (Beta) of 0.304, and a *p*-value of 0.000 ($p < 0.001$). It indicated that technical capabilities and operational execution have the most direct and significant impact on ODT performance. Enhancing technological competencies, optimizing processes, and effectively implementing change initiatives serve as the primary drivers of digital transformation success. These findings highlight that, for organizations to achieve digital transformation goals, they must prioritize strengthening their

technological infrastructure and project execution capabilities.

In summary, the regression results that incorporated both control and core variables demonstrate that all have significant positive effects on organizational digital transformation performance, though the magnitude of their influence varies. Specifically, technical and executional competencies (Hand) are the most decisive factors for successful digital transformation, while strategic management capabilities (Head) provide essential directional support. Meanwhile, emotional leadership (Heart) serves a complementary role by motivating and sustaining the momentum for change. Therefore, organizations aiming to drive digital transformation should prioritize the development of technical execution capabilities, while simultaneously reinforcing strategic leadership and fostering a supportive organizational culture through emotional leadership, thereby ensuring sustained transformation success and overall performance improvement. *Table 65a* is the comparative

of 3H domains on ODT performance.

Domain	Regression Coefficient	Standardize Beta	p-value	Significance	Key Insight
Heart (H^1)	0.142	0.131	0.010*	Significant (Moderate)	Emotional support, Culture & Leadership, communication, trust-building to sustain motivation
Head (H^2)	0.202	0.187	0.000**	Significant (Strong)	Strategic planning, decision-making and resource management to guide ODT
Hand (H^3)	0.281	0.304	0.000**	Highly Significant	Technical capability and operational execution as the primary driver of ODT success

Table 65a: The Comparative of 3H domains on ODT Performance

	Unstandardized Coefficients	Std. Error	Beta	t	p
Constant	0.141	0.318	-	0.443	0.658
Heart	0.142	0.054	0.131	2.585	0.010*
Head	0.202	0.056	0.187	3.617	0.000**
Hand	0.281	0.053	0.304	5.325	0.000**
101-500	0.128	0.12	0.051	1.071	0.285
501-1000	-0.096	0.17	-0.025	-0.564	0.573
10001-5000	0.493	0.142	0.177	3.469	0.001**
>5000	0.713	0.174	0.275	4.106	0.000**
1-4 years	-0.086	0.284	-0.023	-0.302	0.763
5-9 years	0.001	0.269	0	0.002	0.998
10-50 years	-0.222	0.267	-0.106	-0.832	0.406
older than 50 years	-0.378	0.316	-0.135	-1.197	0.232
1-4 years	0.282	0.232	0.109	1.217	0.225
5-7 years	0.282	0.237	0.099	1.189	0.236
8-10 years	0.392	0.248	0.123	1.58	0.115
over 10 years	0.683	0.237	0.327	2.877	0.004**
Gender (female)	0.009	0.092	0.004	0.112	0.921
Age=28-35	0.383	0.174	0.123	2.202	0.029*
Age=36-44	0.61	0.164	0.26	3.716	0.000**
Age=45-52	0.401	0.166	0.173	2.42	0.016*
Age=53-59	0.294	0.188	0.09	1.559	0.12
Age=60 or older	0.466	0.198	0.134	2.346	0.020*
United States of America & Canada	0.083	0.137	0.029	0.606	0.545
Southeast Asia (Singapore， Malaysia， Philippines， Thailand， Vietnam， Indonesia)	0.145	0.147	0.043	0.982	0.327
India	-0.008	0.204	-0.002	-0.04	0.968
Australia	0.312	0.21	0.064	1.486	0.139
Europe & United Kingdom	0.275	0.278	0.042	0.991	0.323
R^2 ·			0.635		
Adj R^2 ·			0.597		
F ·			F (26,244)=16.355,p=0.000		
D-W			1.78		

*Table 65: Regression results including Control & Core variables included - * p<0.05 ** p<0.01*

- **Regression Results with Combined Effects**

Table 66 presents the regression results into the model. It reveals the combined effects of the Heart, Head, and Hand domains and their interactions on ODT performance. The model offered an adjusted R^2 of 0.644, indicating that 64.4% of the variance in ODT performance was explained, representing an improvement over the model containing only the core variables (R^2 = 0.597 in Table 65). This increase suggests that incorporating interaction effects more effectively captures the interrelationships among dimensions and their collective impact on organizational performance. The model fit was also confirmed to be statistically significant (F = 17.295, p = 0.000).

The Hand domain remained the most influential predictor, with a regression coefficient of 0.235, a standardized coefficient (Beta) of 0.254, and a p-value of 0.000 ($p < 0.001$). This finding is consistent with the previous model (Table 65), further reinforcing the critical role of technical capability and operational execution in driving successful digital transformation. Enhancing technological infrastructure and effectively implementing change are confirmed as core drivers of digital strategy execution and organizational performance improvement.

The Head domain demonstrated a regression coefficient of 0.122, a standardized coefficient (Beta) of 0.113, and a p-value of 0.027 ($p < 0.05$), indicating a statistically significant but relatively weaker positive effect on ODT. Compared to the previous model, the direct influence of strategic management capabilities diminished, although the Head continues to play an important role in guiding overall transformation performance. However, the Heart domain showed a regression coefficient of 0.102, a standardized coefficient (Beta) of 0.095, and a p-value of 0.05 ($p > 0.05$), which reluctantly reach statistical significance. This result suggests that the standalone effect of emotional leadership is reduced when interaction effects are considered, implying that emotional support in digital transformation is most effective when combined with other dimensions, rather than functioning independently.

The interaction of Heart_Head_Hand (H1) produced a regression coefficient of 0.154, a standardized coefficient (Beta) of 0.196, and a *p*-value of 0.000, indicating a substantial and significant integrated effect of all three dimensions on ODT performance. This result highlights that when emotional support, strategic decision-making, and technical execution work in synergy, they produce a substantial combined effect on digital transformation outcomes. Such integration helps organizations better manage complex transformation processes, coordinate resources across departments, and effectively engage employees in embracing change, ultimately enhancing overall performance.

The Head_Hand (H2) interaction also demonstrated a significant positive effect on ODT, with a regression coefficient of 0.125, a standardized coefficient (Beta) of 0.134, and a *p*-value of 0.004 ($p < 0.01$). This finding indicates that the combination of strategic management and technical execution capabilities creates a synergistic effect, allowing organizations to effectively translate strategic plans into actionable technological solutions while monitoring and adjusting implementation processes to optimize transformation outcomes.

Nevertheless, the interaction of Heart_Head (H4), Beta of 0.015, and a *p*-value of 0.216 ($p > 0.05$); and Heart_Hand (H3), Beta of 0.026, and a *p*-value 0f 0.151 ($p > 0.05$) were not statistically significant, suggesting that the interactions between emotional support and strategic management or between emotional support and technical execution alone do not strongly influence ODT performance, which may imply that the combination of emotional leadership with either strategy or execution, without full integration of all three dimensions, is insufficient to generate significant performance improvements. Instead, a broader integration across multiple competencies is necessary to achieve the expected synergistic effects. Overall, these results emphasize that while technical capability and execution (Hand) remain the primary drivers of digital transformation success, the interaction between strategic management (Head) and execution, as well as the integrated synergy of Heart, Head, and Hand, play increasingly critical roles in enhancing overall transformation

performance. Therefore, organizations pursuing digital transformation should not only focus on strengthening individual capabilities but also prioritize integrating and coordinating multidimensional competencies to maximize overall performance. These findings offer important theoretical and empirical support for management strategies in digital transformation, underscoring the significance of multidimensional capability integration in managing complex organizational change. The researcher composed a summary table of interaction Effects on ODT Performance (*table 66a*).

Domain	Regression Coefficient	Standardize Beta	p-value	Significance	Key Insight
Heart (H^1)	0.102	0.095	0.055	Not significant	Weakened standalone effect after introducing interactions
Head (H^2)	0.122	0.113	0.027*	Significant ($p<0.05$)	Continues to play an important but reduced role
Hand (H^3)	0.235	0.254	0.000**	Highly Significant ($p<0.001$)	Strongest direct effect on ODT performance
Heart & Head (H4)	-0.015	0.062	0.216	Not significant	No significant interaction effect
Heart & Hand (H3)	0.026	0.075	0.151	Not significant	No significant interaction effect
Head & Hand (H2)	0.125	0.134	0.004**	Significant ($p<0.01$)	Significant synergy between strategy and execution
3H integrated (H1)	0.154	0.196	0.000**	Highly Significant ($p<0.001$)	Strong integrated effect of all three domains

Table 66a: summary table of Combined Effects on ODT Performance – By Researcher

	Unstandardized Coefficients	Std. Error	Beta	t	p
Constant	-0.039	0.315	-	-0.123	0.903
Heart (H¹)	0.102	0.050	0.095	1.932	0.050
Head (H²)	0.122	0.055	0.113	2.227	0.027*
Hand (H³)	0.235	0.051	0.254	4.581	0.000**
Heart & Head (H4)	-0.015	0.036	0.062	-0.428	0.216
Heart & Hand (H3)	0.026	0.043	0.075	0.595	0.151
Head & Hand (H2)	0.125	0.043	0.134	2.875	0.004**
3H integrated (H1)	0.154	0.031	0.196	4.918	0.000**
101-500	0.143	0.113	0.057	1.266	0.207
501-1000	-0.001	0.161	0	-0.008	0.993
10001-5000	0.508	0.135	0.183	3.773	0.000**
>5000	0.701	0.164	0.271	4.276	0.000**
1-4 years	-0.224	0.269	-0.061	-0.834	0.405
5-9 years	-0.093	0.254	-0.032	-0.366	0.715
10-50 years	-0.331	0.252	-0.157	-1.312	0.191
older than 50 years	-0.457	0.298	-0.163	-1.538	0.125
1-4 years	0.331	0.219	0.128	1.514	0.131
5-7 years	0.313	0.224	0.110	1.398	0.163
8-10 years	0.448	0.234	0.141	1.910	0.057
over 10 years	0.659	0.224	0.316	2.948	0.004**
Gender (female)	-0.068	0.087	-0.031	-0.774	0.439
28-35	0.358	0.165	0.115	2.162	0.032*
36-44	0.554	0.157	0.236	3.53	0.000**
45-52	0.331	0.157	0.142	2.109	0.036*
53-59	0.246	0.179	0.075	1.377	0.171
60 or older	0.432	0.188	0.124	2.299	0.022*
United States of America & Canada	0.097	0.129	0.034	0.749	0.455
Southeast Asia (Singapore, Malaysia, Philippines, Thailand, Vietnam, Indonesia)	0.095	0.139	0.028	0.685	0.494
India	0.016	0.193	0.004	0.084	0.933
Australia	0.271	0.210	0.056	1.359	0.175
Europe & United Kingdom	0.363	0.263	0.055	1.381	0.169
R 2 ·			0.684		
Adj R 2 ·			0.644		
F ·			F (30,240)=17.295,p=0.000		
D-W			1.857		

*Table 66: Regression results with Combined Effects - * p<0.05 ** p<0.01*

Second-order constructs such as Heart, Head, and Hand cannot be measured directly and are typically assessed through their associated first-order constructs. In this study, a simplified approach was taken by aggregating related first-order constructs and treating them as distinct composite variables (see Tables 32a to 32c). While this method offers practical advantages, such as reduced model complexity and improved interpretability, it

bypasses formal testing of the hierarchical structure (Koufteros *et al.,* 2009). As a result, it may limit construct validity by assuming, rather than empirically confirming, the second-order relationship. This trade-off is acknowledged, and future research is encouraged to apply full second-order modeling to validate the constructs' structure.

5.5.1 Hypotheses Testing

The researcher conducted a single hierarchical regression analysis in this research which allows the examination of the simultaneous influence of independent variables on control variables, providing a comprehensive understanding of the relationships among variables. With that, the researcher enabled the identification and quantification of Yu's H domains that contribute to the success or failure of digital transformation initiatives.

Hypothesis One (Hy1): ***The Heart domain (H¹), which manifests in heart-oriented leadership, is related to ODT success.***

Hypothesis One is rooted in well-established theoretical frameworks and conceptual underpinnings that underscore the pivotal role of leadership and organizational culture in shaping organizational success. Drawing upon Yu's Heart domain, which emphasizes the significance of leadership qualities and organizational culture, this hypothesis posits that the Heart domain, specifically heart-oriented leadership, plays a central role in motivating employees, fostering a positive organizational culture, and effectively managing change during digital transformation endeavors.

The regression coefficient for the Heart (H^1) factor on ODT is 0.142 (*Table 65*), with a standardized coefficient (Beta) of 0.131 and a *p*-value of 0.010 ($p < 0.05$). This indicates a significant positive impact of the Heart factor on organizational digital transformation performance. Although the strength of this effect is relatively modest (standardized coefficient of 0.131), it indicated the important role of "soft" factors, such as emotional support, leadership communication, and a culture of trust, play in motivating employee

engagement and sustaining momentum for change during the digital transformation process. Emotional support can effectively mitigate employee resistance and enhance team cohesion, especially during the early stages of transformation. The results provide empirical support for Hypothesis Hy1, demonstrating that a well-established heart-oriented leadership approach is significantly associated with organizational digital transformation (ODT) success. However, the empirical findings also indicated that the standalone impact of emotional leadership is attenuated when interaction effects are incorporated into the analysis. This suggests that emotional support within the context of digital transformation achieves optimal efficacy when synergistically integrated with other leadership dimensions rather than operating in isolation.

Hypothesis Two (Hy2): ***The Head domain (H^2), which manifests in a strategic management process, is related to ODT success.***

The extant literature and empirical evidence support a positive relationship between effective strategic management practices and digital organizational transformation's (ODT) success. Through a comprehensive review of relevant scholarly works, the researcher identifies a knowledge gap concerning the head domain's specific contribution to ODT success. This gap serves as the impetus for formulating Hypothesis Two, which posits that the Head domain (Q2, Q5, Q20, Q21, Q24 & Q28), as manifested in proficient strategic management processes, constitutes a pivotal and cause correlation for achieving successful outcomes in the context of ODT (Q31-35).

The regression coefficient for the Head (H^2) domain is 0.202 (*Table 65*) and 0.122 (*Table 66*), with a standardized coefficient of 0.187 and a *p*-value of 0.000 ($p < 0.001$). This indicated a significant positive impact on ODT that is stronger than that of the Heart domain. The results suggest that strategic management and decision-making capabilities are critical to overall performance during the digital transformation process. Effective strategic planning,

resource allocation, and performance monitoring ensure the directionality and sustainability of the transformation process, enhancing the organization's capacity to respond and execute effectively in complex change situations. These findings support the Hypothesis Hy2, contribute valuable insights to the existing body of knowledge, and emphasize that the Head domain (H^2), which manifests in an effective strategic management process, is related to ODT success.

Hypothesis Three (Hy3): ***The Hand domain (H^3), which manifests in functional competencies, is related to ODT success.***

The hypothesis that the Hand domain, manifested in required effective functional competencies, is a key factor for achieving ODT success in organizational digital transformation research is based on theoretical foundations, empirical evidence, and practical significance. The hypothesis highlights the need for organizations to invest in developing and enhancing their workforce's necessary skills and capabilities to navigate the complexities of digital transformation successfully. By investigating the role of the Hand domain (Q13, Q14, Q16, Q26, Q27), the hypothesis contributes to a better understanding of the factors influencing ODT success (Q31-35).

The regression coefficient for the Hand factor (H^3) is 0.281 (*Table 65*) and 0.235 (*Table 66*), with a standardized coefficient of 0.304/0.254 and a *p*-value of 0.000 ($p < 0.05$), making it the factor with the most substantial impact on ODT among all core factors. This indicates that a company's technical capabilities and operational execution have the most direct and significant effect on performance enhancement during digital transformation. Improvements in technical capabilities, process optimization, and the effective execution of changes are core drivers for achieving digital strategic objectives. Therefore, for organizations to succeed in their digital transformation efforts, it is essential to prioritize the development of their technical infrastructure and project execution capabilities. The correlation analysis

demonstrated a significant positive relationship between the Hand domain and ODT success. It indicates that organizations exhibiting strong functional competencies in their operations are more likely to achieve successful digital transformations. These findings provide compelling evidence supporting the Hypothesis Hy3, establishing the crucial role of required effective functional competencies in driving ODT success. The results emphasize the significance of technical and operational capabilities in ensuring favorable outcomes in the context of organizational digital transformation.

Hypothesis Four (Hy4): ***The Synergistic integration of Heart & Head domains (H4), which manifests is related to ODT success.***

The interaction of representing Heart & Head (H4) was included in the regression model to test whether the combined influence of emotional leadership (Heart) and strategic management capabilities (Head) significantly contributes to ODT performance. However, the regression results show that the Heart & Head (H4) interaction has a regression coefficient of -0.015, a standardized Beta of 0.062, and a *p*-value of 0.216, which is not statistically significant ($p > 0.05$). The non-significant result indicates that the synergistic interaction between Heart and Head did not demonstrate a measurable positive effect on ODT performance in this study. Although integrating emotional support (such as trust-building and communication) with strategic leadership (such as vision and planning) is theoretically expected to enhance digital transformation outcomes, the empirical findings do not support this assumption. These results suggest that, while the heart and head are important individually, their combined influence alone was insufficient to impact ODT success significantly within the context of this sample. The findings indicate that Hypothesis Hy4 does not have empirical support and needs revision to align with mechanisms driving digital transformation outcomes. A more integrated approach, combining emotional leadership with other dimensions and organizational initiatives, is essential to unlock synergies and optimize impact.

Hypothesis Five (Hy5): ***The Synergistic integration of Heart & Hand domains (H3), which manifests is related to ODT success.***

In the regression model presented in Table 66, the interaction representing the synergistic integration of the Heart and Hand dimensions (Heart & Hand, H3) was analyzed to assess its influence on ODT performance. The results indicated that the Heart & Hand interaction had a regression coefficient of 0.026, a standardized Beta of 0.075, and a *p*-value of 0.151, which does not reach statistical significance ($p > 0.05$).

Given the complex interdependencies between human-centric and structural factors in digital transformation processes, a more holistic and comprehensive approach is required. Organizations must align emotional, technical, strategic, and operational dimensions within an integrated framework to achieve meaningful and sustainable outcomes. Such an approach ensures that individual and collective efforts are strategically coordinated with organizational objectives, enabling the development of synergistic mechanisms to overcome transformation challenges and fully harness the potential of digital innovation (Vial, 2021).

The non-significant result indicates that although Heart and Hand are individually important, their combined effect may not consistently enhance ODT outcomes. This may occur because Heart's influence is stronger when integrated with Head or the full 3H model, while Hand's dominance in execution may reduce the added value of emotional support. Additionally, organizational culture or maturity may determine whether emotional support is needed alongside technical capabilities to sustain transformation (Kane *et al.,* 2019).

Hypothesis Six (Hy6): ***The Synergistic integration of Head & Hand domains (H2), which manifests is related to ODT success****.*

The regression coefficient for Head & Hand (H2) was R=0.125, with a standardized coefficient of R=0.134 and a statistically significant p-value of 0.004 (p<0.01p), indicating

that the interaction between strategic management and technical execution has a significant favorable influence on ODT. The single hierarchical regression analysis results confirm this relationship's significance, providing empirical support for the corresponding Hypothesis Hy6.

These findings suggest that the integration of strategic management and technical execution represents a sufficient condition positively related to ODT success and implies that while the combination of these elements contributes meaningfully to transformation outcomes, it is not necessarily a sole or primary driver of success. The observed synergy highlights the organization's ability to translate strategic objectives into actionable technical implementation plans and to effectively monitor and refine execution processes. By aligning strategy with execution, organizations enhance their capacity to achieve transformation objectives, positioning this integration as a vital, though not exclusive, factor in the broader framework of digital transformation success.

Hypothesis Seven (Hy7): ***The Synergistic integration of Heart, Head & Hand domains (H1), which manifests is related to ODT success.***

The regression coefficient for the 3H integrated (H1) is 0.154, with a standardized coefficient of 0.196 and a significant p-value (p = 0.000). This indicates that the integrative effect of the "Heart, Head, and Hand" domains has a strong impact on digital transformation performance. This finding suggests that when emotional support, strategic decision-making, and technical execution are effectively aligned, they create a significant synergistic effect on a company's digital transformation. The integration of these three elements likely enhances the organization's ability to manage the complexities of the transformation process, coordinate resources across different functional departments, and effectively motivate employees to engage with and embrace the change, thereby improving overall performance.

The model indicates that technical capabilities and execution strength (Hand – H^3) remain the core drivers of successful digital transformation. However, the interaction effects between technical capabilities and strategic management (Head – H^2), as well as the comprehensive integration of the "Heart, Head, and Hand" domain, play a more critical role in overall transformation performance. Therefore, organizations implementing digital transformation should not only focus on enhancing single capabilities but also emphasize the integration and synergistic effects of multidimensional capabilities to maximize overall performance. These findings provide important theoretical and empirical support for the hypothesis Hy7 and the formulation of management strategies in digital transformation, highlighting the significance of multidimensional capability integration in complex change environments. *Table 67* below is the results summary of hypotheses testing.

Hypothesis	Hypothesis content	Hypothesis testing
H1	Heart (H^1) – Leading Effectiveness	Significantly established
H2	Head (H^2) – Strategizing & Organizational capabilities	Significantly established
H3	Hand (H^3) – Technical & Operating Competency	Significantly established
H4	Heart & Head (H4) – Deficiency of Hand domain factors f ($H^1 \cap H^2 \cap H^3$)	Untenable
H5	Heart & Hand (H3) – Deficiency of Head domain factors f ($H^1 \cap H^2 \cap H^3$)	Untenable
H6	Head & Hand (H2) – Deficiency of Heart domain factors f ($H^1 \cap H^2 \cap H^3$)	Significantly established
H7	3H integrated (H1) – Ideal case of Holistic Management f ($H^1 \cap H^2 \cap H^3$)	Significantly established

Table 67: Results summary of Hypothesis testing

5.6 Discussion of Quantitative Research Findings

Quantitative analysis provides crucial insights into the roles of the heart, head, and hand domains in influencing ODT performance. These findings contribute to understanding how leadership qualities, strategic management, and functional competencies interact to support ODT success. However, the results also reveal nuances regarding the sufficiency and interaction of these domains, shedding light on their respective contributions and limitations.

The Heart Domain

The findings confirm a significant positive relationship between the heart domain and ODT performance, supporting the hypothesis that heart-oriented leadership qualities are critical for successful transformation. Leaders who inspire employees, communicate a clear vision and facilitate change management create a positive organizational culture that supports digital transformation efforts. This aligns with existing literature emphasizing the importance of emotional support and motivation during organizational change. The results underscore the necessity for leadership to actively engage employees and drive alignment with transformation objectives, thus fostering an environment conducive to achieving transformation goals. However, the result also indicated that leadership diminishes when interaction effects are considered, suggesting that emotional support in digital transformation is most effective when combined with other leadership dimensions rather than applied alone.

The Head Domain

The head domain, representing strategic management processes, was also found to have a robust and significant impact on ODT performance. Effective strategic planning, goal setting, and resource allocation emerged as pivotal factors for driving digital transformation success. This finding reinforces the critical role of aligning digital initiatives with broader organizational goals and ensuring that strategic objectives are clearly defined and actionable. These results highlight the importance of long-term vision and systematic planning in navigating the complexities of digital transformation initiatives.

The Hand Domain

Similarly, the hand domain, encompassing functional competencies such as technical skills, digital literacy, and operational efficiency, significantly influenced ODT success. This finding

supports the hypothesis that equipping employees with the skills to leverage digital tools and execute technical operations effectively is essential for achieving transformation objectives. Operational efficiency, enabled by enhanced competencies, contributes directly to the implementation of digital strategies, reinforcing the criticality of workforce readiness in digital initiatives.

Integration of Domains

The integrated model analysis revealed that the alignment and synergy among the Heart, Head, and Hand domains are sufficient for successful organizational digital transformation. While each domain, representing emotional engagement, strategic thinking, and operational execution, is impactful, their integration significantly amplifies their collective influence. This synergy fosters comprehensive organizational capabilities that are critical for driving sustainable transformation.

Additionally, integrating these domains across different dimensions, such as leadership styles, cultural values, and functional priorities, can yield varied outcomes. The weighting of each domain within specific contexts also influences the degree of change management effort required. For instance, emphasizing emotional engagement (Heart) in a highly analytical environment may demand more significant cultural shifts than aligning operational execution (Hand) in a process-driven organization.

These findings underline the necessity of adopting a holistic approach that balances and adapts these domains strategically. By doing so, organizations can bridge the gap between vision, planning, and execution, ensuring a coherent and flexible pathway for transformation tailored to their unique circumstances.

Non-Significance of Interaction Effects

Contrary to expectations, the findings reveal that the interaction effects of the Heart & Head

(H4) and Heart & Hand (H3) domains were not statistically significant and did not support the corresponding hypotheses. That indicates that the combined effects of emotional support with strategic management or technical execution do not directly influence ODT performance in isolation. The lack of significance suggests that while these domains' individual contributions and integrated alignment are sufficient for success, their interactions alone may lack the complexity required to independently predict outcomes.

This result emphasizes digital transformation's intricate and multifaceted nature, which extends beyond domain-level interactions to demand a more comprehensive organizational approach. The findings suggest that achieving optimal ODT performance may require a synergistic alignment across individual domains and at the systemic level, incorporating additional contextual factors such as culture, communication, and external influences. This broader perspective highlights the importance of fostering interconnectedness and holistic integration to fully leverage the transformative potential of these domains.

Implications for Practice and Research

The findings provide valuable implications for organizations and practitioners seeking to improve their digital transformation efforts:

- Heart-oriented leadership is essential for maintaining employee motivation and cultivating a positive organizational culture.
- Strategic planning and resource allocation should remain a focal point to align transformation initiatives with organizational objectives.
- Investments in workforce development and technical skill-building are necessary to enhance operational efficiency and execution capabilities.

In summary, the quantitative findings confirmed the significant individual contributions of the

Heart, Head, and Hand domains to ODT performance while highlighting the importance of their integrated alignment. The lack of support for specific interaction effects suggests that digital transformation success relies on specific domain interactions and broader organizational systems and practices. By understanding and leveraging the synergies among these domains, organizations can enhance their digital transformation strategies and achieve sustained success in an increasingly digital environment.

5.7 Chapter Five Summary

This chapter constitutes a deep dive into the quantitative research findings, scrutinizing the organization's performance in digital transformation. It explicitly attains the three critical H domains: heart, head, and hand. The methodological foundation underpinning this analysis relies on scrupulous data collection through a precisely crafted questionnaire administered to the study's participants. The central objective of the researcher is to embark on a comprehensive exploration beyond surface-level observations. Instead, it seeks to unravel the intricacies and nuances contained within the quantitative analysis findings. These findings significantly illuminate the commanding influence wielded by the three H domains. Moreover, the researcher delves into the interplay of five pivotal constructs: Organization Fundamentals, People-centric approaches, Strategy Formation, Execution Management, Organizational competencies, and Competitive Advantage. These constructs collectively contribute to shaping the ultimate outcomes and successes of digital transformation initiatives within the organization.

By systematically deconstructing these domains and constructs, this chapter not only elucidates key insights but also provides a fundamental roadmap for grasping the intricate and multifaceted dynamics inherent in the organization's digital transformation. This approach is a valuable resource for guiding strategic decisions, fostering adaptability, and maintaining competitiveness in an ever-evolving digital landscape. It is a crucial resource

for those seeking to harness the full potential of digital transformation within the organization.

CHAPTER SIX – DISCUSSION and CONCLUSIONS

6.1 Introduction

This chapter focuses on discussing the research results and their implications for the organization's digital transformation field. The discussion highlights the key themes, trends, and insights from the data analysis, providing a deeper understanding of the research objectives and their implications. Additionally, the chapter concludes by summarizing the theoretical and managerial implications of the key findings, discussing their significance, and outlining potential avenues for future research in the organization's digital transformation field.

6.2 Major Findings

This research aimed to develop a holistic management framework for digital transformation in organizations mirroring Yu's 3H managing framework. Through an extensive literature review, empirical analysis, and expert interviews, key findings emerged that shed light on various framework aspects. The findings highlight critical aspects of the holistic management framework for digital transformation: technology integration, leadership support, organizational culture, resource allocation, risk management, and core competencies of the organization and individuals. These findings emphasize the importance of aligning technology with strategic objectives, cultivating a supportive leadership culture, fostering an innovative organizational culture, allocating resources effectively, managing risks, and considering global challenges and ethical considerations. Incorporating these findings into the framework enables organizations to navigate digital transformation successfully.

6.2.1 Inferences and Implications of the Findings

The research has produced noteworthy outcomes on the primary success factors influencing

ODT. These identified success factors are crucial in facilitating the efficient execution of digital transformation initiatives and achieving desired results. The success of ODT relies on a set of interconnected key factors that necessitate careful consideration. Effective leadership emerges as a critical element in this process, as leaders are responsible for clearly articulating a vision, establishing strategic objectives, and allocating essential resources and support. It is imperative to align digital initiatives with the overarching organizational strategy to enhance competitiveness, improve customer experience, and drive operational efficiencies.

Prudent attention to budgeting and resource allocation is paramount, considering organizations must invest judiciously in technology infrastructure, talent acquisition, and comprehensive training programs. Cultivating a digital culture within the organization is essential for fostering innovation, agility, and adaptability to dynamic market conditions. Moreover, leveraging technology capabilities and integration empowers organizations to harness emerging technologies effectively, streamline processes, and deliver enhanced customer value. In summary, the study underlined the multifaceted nature of success factors in ODT and emphasizes the pivotal role leadership, strategic alignment, resources prudence, and digital cultural development play in achieving successful digital transformation initiatives.

Organizations must also be mindful of the economic and global climate, adapting to market fluctuations, political dynamics, and social trends to navigate the complexities of the business environment. The recent pandemic outbreak has further emphasized the importance of organizational resilience and preparedness, prompting a reevaluation of digital transformation strategies to address new challenges and opportunities (Yu, 2020). Moreover, certain factors such as project management practices, management support, geography, and market behavioral patterns warrant consideration. Implementing efficient project management practices ensures the successful execution of digital transformation initiatives, while robust management support provides guidance, resources, and advocacy.

Other external factors also impact the implementation of ODT, such as geographical issues, regional disparities, and regulatory burdens, and understanding market behavioral patterns and consumer preferences enable organizations to tailor their digital offerings and gain a competitive edge.

The qualitative research results also indicate that the efficacy of integrating the three H domains within a holistic ODT management framework in an organization's digital transformation is paramount. This integration holds significant potential for ensuring a comprehensive and successful transformation journey that aligns with the organization's objectives, engages employees, and drives positive outcomes.

The *Heart* domain encompasses the human element of the digital transformation process, emphasizing the need to foster a supportive culture, address employee concerns, and promote change readiness. Within the Heart domain, cultivating a culture of innovation, collaboration, and adaptability emerged as a fundamental success factor. Organizations with strong leadership support and commitment that prioritize employee engagement, encourage risk-taking, and foster a continuous learning mindset create an environment conducive to successful digital transformation endeavors (Baker, 2021). In digital transformation, effective leaders are important in steering strategic plans aligned with the organization's mission, anticipating challenges, and empowering teams to achieve goals (Burke *et al.,* 2006; Hildebrandt *et al.,* 2015; Buil *et al.,* 2019). During the focus group interviews, numbers of participants suggested that effective communication and composure amid uncertainty are essential leadership attributes in this dynamic change environment.

> *"Leading digital transformation means focusing on achieving clear goals and objectives with a well-structured approach. It's not just about driving change and delivering results but also about fostering effective communication and staying flexible. After all, adaptability and clear communication are key to navigating challenges and ensuring the entire team is aligned throughout the process." (Group H, No. 3 participant)*

By incorporating the Heart domain into the management framework, organizations

recognize that employees are not passive recipients of change but active participants in the transformation. The findings of qualitative analysis found that this approach acknowledges change's emotional and psychological aspects and strives to create a positive and inclusive environment that motivates, engages, and values employees throughout the transformation progress.

The *Head* domain emphasizes the importance of strategic thinking and planning, which pertains to digital transformation's cognitive and strategic aspects, emphasizing the utilization of data, knowledge, and strategic thinking to drive the ODT efforts. Performance-driven evaluation and conflict resolution are indispensable to ensure efficient organizational development and transformation processing (Ajzen, 1991; Barney, 1995). One of the focus group participants, who is the CMO of a global FMCG, claimed that clear strategic planning emerges as a fundamental process within the dynamic landscape of today's rapidly changing business environment, demanding logical thinking, target orientation, and process-driven approaches.

> *"A clear digital strategy details the organization's vision, goals, and objectives for digital transformation and the key initiatives and projects' progress that will be taken as our industry." (Group c, No.1 participant)*

A successful ODT necessitated a well-defined digital strategy that aligns with the organization's overarching business objectives (Yeow *et al.,* 2018). Integrating the Head domain ensures the organization has a clear vision, a well-defined digital strategy, and a comprehensive understanding of the technological landscape and market trends. It enables organizations to make informed and strategic decisions based on data-driven insights, identify potential risks and challenges, and develop effective mitigation strategies (Nilsen *et al.,* 2012). The transformation team needs to exhibit vision, sound decision-making capabilities, and a comprehensive understanding of market dynamics and emerging technologies which are instrumental in driving success within this dimension. Hansen & Schaltegger (2016) emphasized the decision-makers must carefully weigh the pros and

cons of each option and select the most viable and aligned with the organization's long-term digital goals. A participant from Group E, the CEO of a global company, highlighted that incorporating the Head domain within the management framework enhances the

> *"By focusing on the functionalities of the Head domain, we could cultivate a more cohesive vision and decision-making process. It acts as the guiding compass, ensuring all departments move in the same direction. This increased the efficiency of our digital transformation efforts and empowered our leadership team to address challenges proactively and align resources more effectively." (Group E , No. 2 participant)*

organization's capability to align digital transformation initiatives with its overarching strategic objectives.

Yu, (2020) highlighted the *Hand* domain centers on the practical execution of digital transformation initiatives, representing the practical execution and implementation of digital transformation initiatives. It encompasses the process of redesign, technology deployment, and skill development. Many focus group participants were highlighted that based on their experiences, highly intensive transformational processes require substantial technological expertise, advanced analytical skills, and effective implementation capabilities. Organizations ensure a systematic approach to executing digital initiatives by integrating the Hands domain into the management framework (Ng & Kee, 2018). Proficiency in implementation and project management is crucial for translating digital strategies into tangible actions, including establishing a clear roadmap for implementation, employing effective project management practices, and focusing on skill-building and training to equip employees with the necessary capabilities.

> *Based on my experience as an IT Director, intensive digital transformational processes require proficiency in leveraging digital tools, skill in data-driven decision-making, and expertise in agile execution and project management. Additionally, the execution a focus on process automation, clear strategic alignment, and seamless cross-functional collaboration are essential to navigating complexities and achieving sustainable success. (Group F, No. 1 participant)*

A well-planned job design that incorporates an interdependence approach impacts various factors, including productivity, employee satisfaction across all levels, and managerial decision-making processes. Communication between groups is also crucial because tasks need integration (Guzzo & Shea, 1992; Campion *et al.,* 1996). Digital learning involves the use of administrative processes to enhance employees' knowledge and facilitate the continuous flow of skills development. This practice aims to sustain their innovative capabilities through learning, enabling them to achieve personal growth and contribute to improved transformational performance within the organization. Integration of the Hands domain emphasizes the importance of agility, adaptability, and continuous improvement

> *Integrating the norm of the Hand domain really highlights how crucial agility, adaptability, and continuous improvement are throughout the digital transformation journey. It's clear that success in this area relies heavily on allocating sufficient resources, having effective change management processes in place, and fostering cross-functional collaboration. On top of that, it's about executing plans well, keeping a close eye on progress, and making the necessary adjustments along the way to achieve the best possible outcomes. (Group G, No. 1 participant)*

throughout the digital transformation journey, with adequate resource allocation, effective change management processes, and cross-functional collaboration emerging as key success factors within this dimension. Moreover, an organization needs to effectively execute its initiatives, monitor progress, and make necessary adjustments to optimize outcomes.

Although Yu (2020) highlighted that integrating the Heart and Head domains is essential in organizational management, its impact can vary depending on the normative factors. The Heart domain emphasizes emotional intelligence, collaboration, and fostering an innovative and daring work atmosphere. Conversely, the Head domain focuses on strategic precision,

cohesive implementation, and resource management. While these aspects are crucial, hierarchical regression analysis suggests their significance may be context-dependent and not uniformly impactful across all transformation efforts.

An innovative and daring work atmosphere, often associated with the Heart domain, fosters creativity and adaptability. It empowers teams to explore novel solutions, aligning with the agile demands of digital transformation. However, the regression results indicate that its influence might not be as critical in some contexts, potentially due to organizational resistance or misalignment with core business strategies. Similarly, precise and cohesive implementation; a hallmark of the Head domain which ensures that digital initiatives are executed efficiently and in line with organizational goals. While crucial for operational success, its significance may diminish if strategic priorities are not well-communicated, or rapid market changes render rigid planning less effective.

Resource management, another key Head domain factor, underpins financial, technological, and human capital allocation. However, the regression findings suggest that resource management alone might not drive transformation significantly unless combined with visionary leadership and cultural readiness. Ultimately, the interplay between the Heart and Head domains underscores the need for balance. While innovative cultures and structured implementations are valuable, their actual impact emerges when aligned with broader organizational goals, adaptable leadership, and a forward-thinking mindset. As such, that reinforces the conclusion that digital transformation is a multidimensional effort, where isolated factors may not singularly determine success.

> *Digital transformation can't work without the right tech skills and people who know how to use them. Even if a company has a great culture and a solid plan, it won't get far if there aren't skilled workers to handle the technology. Technology is at the heart of digital transformation, and without the right people to make it work, even the best strategies will fail. You need both a good plan and the right hands to bring it to life. (Group F, no. 2 participant)*

The Heart and Hand domains combine foster teamwork, sound judgment, decisiveness, and

a strong learning environment in the context of digital transformation. However, findings from hierarchical regression suggest that these beneficial factors may not independently determine ODT success. The Heart domain, rooted in organizational culture and effective change management, is critical in creating an atmosphere where teamwork and adaptability flourish. A learning environment helps cultivate skills and encourage innovation, but without clear direction and structured execution, these efforts can lack impact. No matter how collaborative, organizational culture alone cannot drive transformation without alignment to specific objectives and outcomes.

The Hand domain, emphasizing practical execution, relies on sound judgment and decisiveness to navigate the challenges of digital transformation. Prompt decision-making and action are vital in fast-changing environments, yet these traits must be paired with cohesive communication strategies to ensure alignment across the organization (Helfat & Martin, 2015). Misaligned decisions or insufficient communication can lead to resistance, inefficiencies, and lost opportunities. Ultimately, Heart and Hand must work in concert with the Head domain, strategic planning and resource alignment. While teamwork, change management, and decisiveness are critical enablers, their full potential is realized only when tied to a clear vision and strategy. By connecting culture, communication, and execution to well-defined goals, organizations can transform these elements into drivers of meaningful and sustainable digital transformation.

Firstly, it enables a comprehensive, integrated approach that leaves no critical aspect unattended, fostering alignment, synergy, collaboration, and effective communication across departments and teams (Helfat & Martin, 2005). Team effectiveness can have different

> *Digital transformation (ODT) won't work if it only focuses on people skills or good leadership without action. While having a great culture and motivated people helps, it's not enough. You need real, practical steps that connect technology with teamwork to get results. Without using tech properly and working together, even the best ideas will fail. ODT works best when human values go hand-in-hand with clear plans, smart use of technology, and good execution. (Group I, No. 2 participant)*

dimensions to meet ODT goals. This holistic approach optimizes resource utilization and minimizes potential conflicts or gaps. Secondly, it enhances employee engagement and buy-in. Organizations should recognize and address emotional and psychological aspects of change and provide necessary knowledge, resources, promotion, rewards, and support for practical digital initiative implementation (Vial, 2021). Engaging employees at all levels instils ownership and commitment, leading to heightened motivation, productivity, and successful digital transformation outcomes.

The integration of the Head and Hand domains, strategy and capabilities enable organizations to execute plans with precision while adapting to dynamic environments. The synergy between strategic foresight and operational expertise is particularly evident in practices such as accountability and effectiveness, conflict management, and data protection (Holotiuk & Beimborn, 2017). The results of a single hierarchical regression analysis reflected the interplay between these factors and echoed the comments from the focus group participants.

In accountability and effectiveness, the Head domain ensures that strategic objectives are clearly defined, measurable, and aligned with organizational goals. The Hand domain translates these objectives into actionable plans, ensuring teams remain responsible for outcomes. For example, accountability frameworks can be operationalized through project management tools that track performance metrics, ensuring that efforts contribute to measurable ODT progress. The regression results suggest that without this integration, gaps between strategic planning and operational execution can significantly hinder transformation

efforts. Handling conflicts represents another critical area where the Head and Hand domains intersect. Strategically, the Head domain provides a structured framework for conflict resolution, aligning disputes with broader organizational priorities. The Hand domain emphasizes practical capabilities such as negotiation and communication skills. The hierarchical regression results highlight that these domains, when combined, ensure conflicts are addressed constructively, minimizing disruptions and maintaining focus on ODT goals.

Data protection, a cornerstone of digital transformation, further illustrates the interplay between strategy and capabilities (Barrick *et al.,* 2015). The Head domain defines policies and governance structures to ensure compliance with regulations and mitigate risks. The Hand domain operationalizes these policies by implementing technical safeguards, staff training, and regular audits. The regression findings reinforce the need for this dual approach to achieve robust and sustainable outcomes. Ultimately, integrating the Head and Hand domains, supported by the hierarchical regression results, underscores the importance of combining strategic vision (Head) with exceptional capabilities (Hand). When applied to accountability, conflict management, and data protection, this integration ensures that ODT efforts are effective, sustainable, and aligned with transformative goals.

> *If we want digital transformation to succeed, we can't just rely on big plans or strong skills alone. Strategy gives us direction, and capabilities make things happen, but they must work together with enough budget. For example, clear goals and tools keep everyone accountable, good communication helps handle conflicts smoothly, and proper training and systems protect data. Based on my past experiences, it's clear that mixing a solid strategy with practical action is the only way to get real results. (Group A, No. 3 participant)*

Lastly, the Yu's holistic management framework serves as a diagnostic tool for evaluating and addressing the complexities and uncertainties associated with digital transformation. By integrating the Heart domain, the framework enables organizations to remain responsive to employee concerns and adapt to evolving needs and expectations. Within the Head domain,

organizations can systematically collect and analyze relevant data, track progress, and make evidence-based decisions to guide their transformation efforts (Yu, 2021). The Hand domain offers practical tools and methodologies for effectively implementing and monitoring digital initiatives, enhancing organizational agility, flexibility, and resilience. Through this comprehensive approach, the framework equips organizations with the necessary capabilities to navigate the dynamic digital landscape and achieve their intended transformation objectives.

In addition to the 3H framework, several cross-cutting success factors were identified as pivotal in ODT. These include effective communication practices at all organizational levels, a culture of continuous learning and upskilling, and the ability to adapt to evolving market conditions and technological advancements (Hofstede, 2011; Holotiuk & Beimborn, 2017). Organizations can optimize their digital transformation endeavors by incorporating these success factors within the 3H framework. Adopting a holistic approach that integrates the Heart, Head, and Hand dimensions while simultaneously addressing the cross-cutting success factors enhances the likelihood of achieving successful ODT outcomes and positions the organization for long-term success.

To mitigate any unforeseen risks, organizations must ensure harmonious and balanced interactions among all H domains—Heart, Head, and Hand. This holistic approach not only strengthens the alignment between vision, strategy, and execution but also enhances the organization's ability to adapt to challenges and achieve its strategic objectives effectively. By fostering such integration, organizations can create a resilient framework that supports sustainable growth and long-term success. The figure below illustrates Yu's 3H Framework for Holistic, effective management.

6.3 Discussion and Suggestions

The researcher highlights the areas to advance the understanding and implementation of digital transformation strategies. Through a balanced blend of theoretical insights and practical implications, this chapter sets the stage for organizations to reflect on their digital transformation journeys and make informed decisions for future endeavors (*Table 68).*

Theoretical Implications	Managerial Implications
• Executive Sponsorship and Engagement in Driving Digital Transformation • Strategic Alignment and Impact of Digital Transformation • Significance of Expertise and Skills in Driving Digital Transformation • Synergistic Alignment of People, Strategy, and Technology • Adaptability of Digital Transformation Processes	• Craft a Cohesive Vision and Comprehensive Digital Strategy • Promoting Active Employee Engagement and Empowerment • Implementing Robust Change Management Protocols • Promoting Learning Culture and Skill Building Initiatives • Leadership Advocacy and Inclusivity • Persistent Performance Surveillance and Assessment • Ethnic Background and Global Challenges • Long-term Resilience and Risk Mitigation

Table 68: Major Factors of Theoretical and Managerial Implication

6.3.1 Theoretical Implications

This study significantly advances the theoretical understanding of ODT by exploring the application of the 3H holistic management framework, which integrates leadership, strategy, and functional competencies. The findings highlight the importance of various factors in driving successful digital transformation initiatives, thereby contributing valuable insights to the literature on this subject. By examining the theoretical implications through the lens of the 3H framework; comprising the Heart, Head, and Hand domains, the research provides a deeper understanding of how these dimensions interact. Yu (2021) likens the 3H framework to a dragon boat crew, with the drummer, paddler, and steerer symbolizing a unified approach to managing ODT. This metaphor enriches our comprehension of the

complex dynamics at play. Through these theoretical contributions, the researcher strengthens the existing body of knowledge and offers a more holistic perspective on managing digital transformation.

The first theoretical implication of this research establishes a connection between the three main dimensions of ODT challenges, barriers, and critical success factors, each presenting obstacles that organizations must overcome to achieve successful transformation outcomes. Addressing these challenges effectively requires strategic initiatives to mitigate financial constraints, modernize legacy systems, foster a changing culture, invest in digital talent and training, ensure regulatory compliance, and implement robust performance monitoring mechanisms. Insights from focus group participants reinforce this need. As one participant noted, the ODT's interconnection of challenges and critical success factors underscores the necessity of strategic initiatives. (Group B, No. 4 participant). Another participant emphasized the importance of continuous improvement, long-term planning, and risk control (Group G, no. 2 participant).

These perspectives highlight organizations' need to adopt comprehensive change management strategies, secure strong leadership commitment, allocate sufficient resources, and address technological deficiencies through strategic partnerships or acquiring necessary expertise. Such measures are essential to mitigate risks and ensure the seamless execution of transformation initiatives.

By incorporating these insights into strategic planning and operational practices, organizations can better navigate the complexities of ODT, overcome structural and operational constraints, and achieve sustainable digital transformation in today's rapidly evolving business landscape.

> *No company can finish digital transformation without a solid plan, with a strong leadership, have a good change management, solid technological skills, and the right resources. These are important to overcoming challenges and finishing lasting progress in today's fast-moving business world. But even if you manage to get everything right and succeed at first, you could still fail later if you don't keep improving and checking in regularly. (Group G, no. 2 participant)*

The integration of leadership, strategy, and functional competencies emerges as a central implication of this study, underscoring their interdependent roles in driving digital transformation. This research contributes to understanding the multifaceted nature of digital transformation by examining the interplay among the Heart, Head, and Hand (3H) domains. The researcher concurs with Guy (2019) on the importance of adopting a holistic approach that integrates these dimensions into organizational strategies and implementation efforts. The findings suggest that organizations can improve their likelihood of digital transformation success by aligning leadership qualities, strategic management processes, and functional competencies. This perspective is consistent with existing literature, reinforcing the importance of treating these elements as interconnected and mutually reinforcing (Sebastian *et al.,* 2020). Recognizing the interdependencies among Yu's 3H domains enable organizations to navigate challenges and capitalize on opportunities throughout their digital transformation journey. The theoretical foundation provided by this study offers meaningful insights for both practitioners and scholars, informing managerial practices aimed at achieving successful digital transformation initiatives.

> *"The ODT's interconnection of challenges and critical success factors underscores the necessity of strategic initiatives, strong leadership, effective change management, and resource allocation to address complexities and achieve sustainable transformation in a dynamic business environment." (Group B, no. 4 participant)*

- **Executive Sponsorship and Engagement in Driving Digital Transformation:**

In this study, the Drummer metaphor represents the pivotal role of leadership in driving digital transformation by setting the rhythm, motivating the team, and maintaining the pace of progress. The findings emphasize that leadership, particularly as conceptualized within the Heart domain, is fundamental to successful ODT. This dimension encompasses essential leadership qualities, including articulating a clear vision, effective communication, employee engagement, and managing change processes. Such leadership is responsible for guiding the organization through the complexities of digital transformation, ensuring strategic alignment with technological advancements while fostering a culture of innovation and adaptability (Singh *et al.,* 2020; Verhoef *et al.,* 2021). Participant insights from the focus groups reinforce this perspective. Specifically, one participant noted that:

> *Leader is responsible for creating and clearly communicating a vision for the organization's digital future. This vision sets clear goals and motivates employees to get involved and support the changes needed to move forward. And the goal needs a good strategy behind and able to meet the business need. (Group E, no. 2 participant)*

This statement illustrates the critical responsibility of digital transformation leaders to define and communicate a compelling vision and develop actionable strategies that align with business needs and inspire organizational commitment. Leaders play an essential role in fostering engagement and sustaining momentum throughout the transformation process by creating a sense of purpose and urgency. These findings are consistent with existing literature on leadership and change management, highlighting that effective leadership is indispensable in navigating the challenges of digital transformation. Leaders who combine visionary thinking with strategic planning and emotional engagement create the conditions necessary for successful, long-term digital transformation outcomes.

- **Strategic Alignment and Impact of Digital Transformation:**

The steerer, representing the technological infrastructure and digital capabilities, ensures that the dragon boat stays on the course. In charting the course, a competent steerer keeps

abreast of changing conditions, movements of racing boat and always identifies the right course for the boat. This research highlights the importance of effective strategic management processes in achieving favorable digital transformation outcomes. The Head domain, encompassing strategic planning, goal setting, and resource allocation, is vital in guiding digital transformation initiatives. Focus group C and F participants tend to agree that strategic management processes play an important and multifaceted role in shaping the outcomes of digital transformation initiatives within organizations.

The researcher concurs with Hrebinia (2006) and Nilsen (2020), who emphasized that successful digital transformation requires organizations to effectively plan, execute, and monitor their strategies to achieve desired outcomes and maintain competitiveness in an increasingly dynamic digital environment. Within the IT-driven changes, centralized control is often preferred, while formalization and standardization are essential to digital strategy. These elements ensure that processes and procedures are well-documented, supporting consistent, technology-enabled implementation and regulatory compliance. Strategic management processes provide a robust framework that aligns the organization's goals, resources, and activities with digital transformation's unique challenges and opportunities.

> *"To make digital transformation work, you need a solid plan and smart management. Constantly checking progress helps you stay flexible, fix problems, and get the best results. These steps make it easier to handle all the tricky parts of going digital..“ (Group D. No. 3 participant)*

Focus group C, the No. 2 participant, shared his experience in ODT, which, by engaging in strategic planning, organizations can proactively anticipate future challenges and opportunities in the digital realm. This foresight enables the researcher to identify potential areas of competitive advantage, capitalize on emerging technologies, and make well-informed decisions regarding digital investments and resource allocation. The findings indicate that strategic management processes are critical to continuously evaluating and refining digital transformation initiatives. Regular monitoring, assessment, and review allow

organizations to measure the effectiveness of their strategies, identify gaps, and implement necessary improvements to enhance outcomes. These results advance theoretical understanding by highlighting the importance of strategic management practices that support organizations in effectively addressing the complexities of digital transformation.

- **Significance of Expertise and Skills in Driving Digital Transformation:**

A key theoretical implication of this research is the critical role of functional competencies in driving the success of digital transformation initiatives. The paddlers, representing employees and their functional competencies, symbolize the driving force propelling the organization forward in its transformation journey. Quantitative analysis findings emphasize the importance of the Hand domain, which includes technical skills, digital literacy, and operational efficiency, as a crucial determinant in achieving digital transformation objectives. Existing literature supports this perspective, with Warner and Wager (2019) and Pittaway and Montazemi (2020) highlighting the paramount role of functional competencies in enabling organizations to succeed across various dimensions of digital transformation. These competencies equip organizations with the skills, knowledge, and expertise necessary to effectively utilize digital technologies and manage the complexities of the digital landscape.

Moreover, insights from participants in focus groups A and E align with these findings, recognizing that functional competencies encompass a wide range of capabilities essential for meeting digital transformation goals. These capabilities include technical proficiency and the ability to adapt to and address the operational and strategic demands of digital transformation. Based on these findings, organizations are advised to prioritize developing and enhancing functional competencies across their workforce. By fostering technical skills, promoting digital literacy, and improving operational efficiency, organizations can better position themselves to achieve their digital transformation objectives and sustain long-term

success in an increasingly digital environment.

> ***Participant 1:*** *Well, it's really about making sure everything flows smoothly—processes, workflows, systems, all of it. They need to be optimized to keep operations streamlined and avoid bottlenecks.*
> ***Participant 2****: Exactly. And leveraging digital technologies is key. Automating those repetitive tasks frees up time for teams to focus on more strategic work.*
> ***Participant 3****: Plus, it's not just about automation. Digital tools can really improve collaboration and communication across teams, which boosts overall efficiency.*
> ***Participant 4****: But to do all that, organizations need a solid understanding of their business processes and the digital tools out there. It's about knowing how to really optimize workflows to get the most out of these technologies.*

Technical skills and digital literacy are the functional competencies in digital transformation. Employees must possess the technical expertise required to utilize digital tools and platforms effectively, understand emerging technologies, and apply them to foster innovation and operational efficiency within the organization. These findings align with the observations of Morton *et al.* (2020), who emphasize that digital literacy equips employees to navigate and interpret digital information proficiently. This capability enhances digital fluency and enables employees to adapt more readily to the demands of digital transformation. Operational efficiency also emerges as a critical aspect of functional competencies in digital transformation. Insights gathered from Groups H and J participants revealed that optimizing processes, workflows, and systems is essential to achieving streamlined operations and enhancing productivity. Participants recounted prior experiences highlighting the importance of leveraging digital technologies to automate repetitive tasks, improve communication and collaboration, and boost overall efficiency. Their reflections highlighted the need for a robust understanding of business processes, the effective use of digital tools, and workflow optimization techniques to ensure successful implementation.

Based on these findings, the researcher recommends that organizations prioritize the development of technical expertise and operational efficiency as core drivers of digital transformation success. Functional competencies must be treated as strategic imperatives, ensuring organizations can fully leverage digital innovations to achieve their objectives. A

key focus area should be enhancing data management and analysis capabilities. The researcher tended to agree Mergel *et al.* (2019) and Li *et al.* (2021) that the effective data management practices and robust analytical techniques are essential for deriving actionable insights, enabling evidence-based decision-making, and implementing strategic initiatives. To maximize the value of data and achieve transformative outcomes, organizations should invest in developing competencies in data governance, management, and analysis across all relevant workforce levels. Furthermore, fostering a culture that values continuous skill development and innovation will better position organizations to harness the potential of digital technologies and remain competitive in an increasingly data-driven environment.

- **Synergistic Alignment of People, Strategy, and Technology:**

In this research, the metaphor of navigating a dragon boat is employed to illustrate the dynamics of organizational digital transformation (ODT), emphasizing the essential alignment between human and technological elements. Successful digital transformation requires advancements in technology, active employee engagement, and empowerment. Empowered employees are key drivers of digital initiatives, enhancing outcomes and fostering organizational growth (Guinan *et al.,* 2019). Organizations should cultivate a culture that values employee involvement, encourages participation, and acknowledges contributions to achieve this.

The researcher typically endorsed Yu's (2020) idea that effective change management and transparent communication are critical for overcoming resistance, addressing employee concerns, and maintaining clarity throughout the transformation journey. A holistic approach, balancing the human and technological dimensions, is pivotal for achieving sustainable success in ODT efforts. Organizations must prioritize enhancing employees' digital literacy, technical skills, and adaptability by offering targeted training programs and ensuring access to necessary resources. Equipping employees with these competencies enables them to

drive digital innovation and navigate the complexities of transformation effectively.

Furthermore, fostering a culture of continuous learning, experimentation, and knowledge sharing encourages employees to embrace change and contribute meaningfully to the organization. Drawing inspiration from Taoist principles, particularly the balance of *Yin* and *Yang*, offers a valuable perspective for achieving harmony between human creativity and technological advancement (Xing & Sims, 2012; Li *et al.,* 2021). This equilibrium integrates human adaptability and strategic vision with the capabilities of digital tools, reflecting the dynamic and evolving nature of digital transformation. The Taoist emphasis on natural flow and flexibility provides a framework for responding to uncertainty with agility (Lee, 2003). Organizations can foster collaboration, innovation, and resilience by adopting a holistic, people-centric approach, empowering them to thrive in an increasingly digital landscape.

> *The importance of strong leadership support really stands out here, showing how critical it is for top management to stay committed and involved when dealing with challenges and driving change. Good leaders should create an inclusive culture by encouraging different ideas and supporting innovation. They also need to focus on helping employees build their digital skills and knowledge, while putting solid change management practices in place to keep information flowing. This kind of teamwork and shared learning is seen as the key to helping organizations keep up with new digital trends and stay competitive as things keep changing. (Group E, participant No. 1)*

> *Strong leadership is essential for guiding digital transformation, with senior management playing a key role in overcoming challenges and leading change. By fostering innovation, supporting diverse ideas, and developing employees' digital skills, leaders help build a culture of continuous learning, ensuring the organization stays competitive in a rapidly evolving digital world. (Group F, participant No. 2)*

Numbers of participants (*cf.* the above example) from Focus Groups emphasized the importance of strong leadership support, highlighting the critical role of top management commitment and involvement in overcoming challenges and facilitating change. Effective leadership, they noted, should cultivate a culture of inclusion by encouraging diverse perspectives and fostering innovation. Additionally, participants highlighted the need for leadership to prioritize the development of digital skills and literacy among employees while

implementing robust change management practices to promote knowledge dissemination, and such a collective learning approach was identified as essential for enabling organizations to adapt to emerging digital trends and maintain competitiveness in an evolving landscape.

- **Adaptability of Digital Transformation Processes:**

This study points out the importance of agility and adaptability in digital transformation. As organizations face rapidly evolving technologies, shifting customer expectations, and market disruptions, it is essential to recognize that digital transformation is an ongoing process rather than a one-time project. Organizations must develop a culture that supports experimentation, views failure as a learning opportunity, and encourages innovation through calculated risks.

Collaboration with external stakeholders—such as industry partners, technology providers, startups, and research institutions, emerges as a key factor in accelerating digital transformation efforts. Furthermore, investing in market intelligence and conducting competitive analysis are vital strategies for understanding emerging trends, customer behaviors, and competitor tactics. A customer-centric approach involving continuous feedback and data analysis is crucial to adapting digital strategy and meeting the evolving needs of consumers (Sousa & Rocha, 2019).

The researcher generally agreed with Lee (2013) that the principles of Taoism offer a profound and adaptable framework for navigating the complexities of business operations and managerial practices. Rooted in concepts such as harmony, balance, and the natural flow of change (often referred to as *Wu Wei* or effortless action), Taoism encourages organizations to operate with a mindset of adaptability and openness, embracing change and responding flexibly to shifting circumstances. Rather than resisting the rapid shifts and disruptions inherent in the digital landscape, Taoist principles advocate for embracing these

changes as natural and inevitable, leveraging them to drive growth and innovation. By "*flowing with the current*," organizations can better adapt to market trends, technological advancements, and evolving customer expectations (Moon, 2015). This approach promotes agility, resilience, and the capacity to pivot when faced with unexpected challenges. Furthermore, Taoism highlights the value of simplicity and balance, which can inform decision-making processes in transformation initiatives (Carnogurská, 2012). Organizations that strive to simplify overly complex systems and balance short-term priorities with long-term goals can achieve more sustainable outcomes (*cf. Appendix 4, Group C, no. 2 participant*). By internalizing these principles, leaders and teams can foster a culture of

> *Group C: Organizations must actively engage within their core industry to gain insights and effectively anticipate future developments.*
> *Group D: It's crucial to have standard operating procedures (SOPs) and a monitoring system in place to keep track of progress and maintain control.*
> *Group H: Dream big, move forward with care, and stay open to new ideas and innovation.*
> *Group K: Stay curious – keep up with the latest tech trends and keep an eye on your competitors*

mindfulness, continuous learning, and innovation, ensuring their digital transformation journey is harmonious and impactful.

The evaluation pattern allows for identifying gaps, areas for improvement, and emerging trends, enabling organizations to make timely adjustments to their strategies. Organizations must stay updated with the evolving regulations and ensure compliance with data protection, privacy, cybersecurity, and other relevant laws. Keeping a pulse on industry trends and emerging technologies is critical in a dynamic digital environment, thus, Organizations should establish mechanisms to scan and evaluate technology advancements, identify potential disruptors, and explore innovative applications that can drive their digital

transformation initiatives, which frequently aligned with the participants of the focus group (*cf.* the above example). Most importantly, the digital team needs to emphasize the importance of continually reassessing and adjusting strategies, competencies, and leadership approaches to align with the rapidly evolving digital landscape.

The theoretical implications of organizational digital transformation are multifaceted, encompassing the integration of leadership, strategy, and functional competencies. They emphasize the critical importance of strategic management processes, the interplay between human and technological elements, and the dynamic influence of external business environments on digital transformation efforts. These findings advance scholarly understanding of digital transformation and offer valuable insights for organizations striving to navigate the complexities of digitalization effectively.

6.3.2 Managerial Implications

Managerial implications are crucial in translating research findings into actionable strategies for organizational leaders. They provide managers with practical guidance on applying research insights to improve decision-making, strategy development, resource allocation, and overall management practices. These implications help bridge the gap between theory and practice, offering concrete recommendations for addressing challenges, leveraging opportunities, and enhancing organizational performance.

In this study, the researcher utilized the 3H framework—comprising the Heart, Head, and Hand domains—to explore the complexities of ODT. This framework offers a comprehensive approach that advances theoretical understanding of managerial applications. By integrating the Heart, Head, and Hand domains, managers gain a structured way to navigate the challenges of digital transformation.

The findings of this research provide actionable insights for managers looking to optimize

digital transformation efforts and achieve successful outcomes. By adopting the managerial recommendations derived from this study, organizations can proactively respond to digital disruptions, capitalize on emerging opportunities, and ensure the effective execution of digital transformation initiatives. Integrating research findings with practical managerial implications is essential for helping organizations adapt to the rapidly changing digital landscape and achieve long-term success in today's competitive business environment.

- **Craft a Cohesive Vision and Comprehensive Digital Strategy:**

That is paramount for organizations and managers engaging in ODT. A clear vision is a guiding force, providing direction and purpose to the digital transformation journey. Managers should articulate a compelling vision highlighting the organization's desired digital future and communicating its strategic intent to stakeholders and define a clear vision and strategy and foster a culture that encourages innovation, and collaboration. An organization needs cross-functional teams to facilitate sharing of diverse perspectives and expertise, and to execute innovative solutions. This vision should be supported by a well-defined digital strategy aligning with the overall business objectives and outlining the steps for successful transformation. Furthermore, organizations should establish mechanisms for knowledge sharing, such as digital communities of practice or regular digital transformation forums, to facilitate the exchange of ideas and experiences among employees.

In alignment with the focus group findings, empowering employees to contribute ideas and experiment with digital technologies emerged as a critical factor in fostering a culture of innovation. Managers can promote employee involvement by creating platforms for idea-sharing, establishing innovative challenges, and providing resources for experimentation. Recognizing and rewarding innovative contributions further reinforces engagement and creativity among employees. The researcher concurs with Bonnet *et al.* (2015) that organizations should prioritize learning and development initiatives to equip employees with

the digital skills and competencies necessary for successful transformation, a view also echoed by participant no. 2 from focus group J (Appendix 4). This proactive strategy enhances workforce readiness and engagement, enabling employees to play a meaningful role in driving transformation efforts. The focus group findings highlighted the importance of involving employees in co-creating solutions, which fosters a sense of ownership and collective commitment to innovation.

Additionally, the Taoist principle of *Wu Wei*, emphasizing effortless action and alignment with natural flows, provides a valuable perspective for managing organizational change (Lee *et al.,* 2013). Adopting a flexible and adaptive approach allows organizations to let digital transformation evolve organically, reducing resistance and mitigating the risks associated with overly rigid plans. This approach, which resonates with the dynamic nature of digital

> *I think Chinese management really values the idea of Tao, which is all about being flexible and letting things happen naturally without forcing them. I believe organizations should take this approach, allowing change to happen smoothly with less pushback. Having a clear plan, listening to feedback, and staying aware of market trends are all important for encouraging new ideas, teamwork, and long-term success with digital projects. (Group A, No. 3 participant)*

ecosystems, enables organizations to remain resilient and innovative, aligning technological advancements with strategic objectives and human collaboration.

Combined with Zhang (2016) and the comments of the focus group participants, the researcher suggests strengthening the development of a clear vision and digital strategy. Organizations should actively engage in strategic foresight exercises, conduct comprehensive market and technology scans, and routinely assess and refine their digital initiatives based on feedback and performance metrics. Incorporating these practices into their strategic approach enables organizations and managers to establish a solid foundation for successful digital transformation. This approach enhances digital strategy and fosters a

culture of innovation, collaboration, and empowerment, which is essential for advancing the organization's digital initiatives.

- **Promoting Active Employee Engagement and Empowerment:**

The researcher highlights the imperative for managers to prioritize employee engagement and empowerment as key factors in successful digital transformation. Managers are encouraged to actively involve employees in decision-making processes, offer continuous learning and development opportunities, and acknowledge their contributions throughout the transformation journey. Focus group findings (*cf.* Appendix 4 and 6) aligned with existing research, suggested that engaged and empowered employees demonstrate higher motivation and commitment to organizational objectives, thereby fostering greater willingness to embrace and support digital initiatives (Hambley *et al.,* 2007; Schwarzmüller *et al.,* 2018; Shaughnessy, 2018).

Involving employees in decision-making leverages their expertise and perspectives and enhances ownership of the digital transformation process. This collaborative approach cultivates a sense of shared responsibility, encouraging employees to contribute unique insights and innovative ideas for digital solutions. By fostering such an inclusive and participatory culture, organizations can better align their transformation efforts with employee engagement, thereby driving more effective and sustainable outcomes.

The researcher suggests that leading by example is a critical strategy for driving successful Organizational Digital Transformation (ODT), as emphasized in The Art of War (Wee *et al.,* 1996). Leaders who actively participate in transformation efforts, adopt new technologies, and prioritize the development of their digital competencies demonstrate a clear commitment to digital change. This leadership behavior aligns with the participants' comments in the focus group, emphasizing the importance of visible and proactive leadership in inspiring employees to adopt similar attitudes and behaviors toward transformation initiatives.

Leaders must prioritize employee engagement and empowerment to achieve successful digital transformation outcomes. This involves creating a culture that values continuous learning, actively recognizes employee contributions, and fosters participation at all levels. Focus group participants also highlighted the significance of transparent communication and inclusive decision-making, which build trust and reinforce employee alignment with organizational goals. Furthermore, the findings underline the need for structured opportunities, such as innovation workshops and cross-functional collaboration initiatives, to enable employees to contribute their ideas and skills to the transformation process (Sha, 2018, pp.195-199). By modelling adaptability and innovation, leaders drive ODT efforts and lay the foundation for a resilient, forward-thinking organizational culture supporting sustained success.

> *In my view, a successful ODT requires a leader who leads by example while genuinely empowering employees through open communication, active involvement, and inclusive decision-making. I believe leaders must be adaptable and innovative, encouraging employees to share ideas in daily collaboration, building trust, and creating a sustainable path for lasting transformation. (Group B. No. 2 participant)*

> *From my perspective, effective digital transformation happens when leaders not only guide the process but actively participate alongside their teams. It's important for leaders to stay flexible, think creatively, and involve employees in meaningful ways. By fostering trust and encouraging fresh ideas, they help shape lasting, impactful transformation. (Group 1, No. 1 participant)*

- **Implementing Robust Change Management Protocols:**

Most focus group participants commented that the root cause of challenges in implementing robust change management protocols lies in addressing resistance to change and ensuring transparent communication throughout the digital transformation process. They highlighted that effective change management is a supportive tool and a critical determinant of success or failure in transformation efforts. Resistance often stems from employees' uncertainty about the transformation's rationale, objectives, and potential impact. A lack of clarity about

how changes affect their roles, and the organization amplifies doubt and disengagement. To counter this, managers must proactively establish transparent communication channels informing employees about the transformation's progress, goals, and benefits.

Equally important is fostering a culture of trust by openly addressing concerns, consistently providing updates, and actively seeking employee feedback. These actions mitigate fears, encourage participation, and create a collaborative environment. By embedding robust change-management practices, organizations can navigate transformation more effectively, ensuring smoother adoption and long-term success.

The researcher concludes that a multifaceted approach is essential for developing a comprehensive change management strategy tailored to the organization's specific needs and perspective. This strategy should involve evaluating the organization's readiness for change, identifying potential challenges and risks, and outlining targeted actions to address them. To promote ownership and collaboration, it is necessary to involve key stakeholders and employees at all organizational levels throughout the change process. Organizations can ensure a smoother transition to organization transformation by improving employees' preparedness for change. A well-structured change management strategy, coupled with open and transparent communication and proactive attention to employee concerns, can foster an environment conducive to change readiness and support the successful implementation of digital transformation initiatives.

- **Promoting Learning Culture and Skill Building Initiatives:**

> *"A positive learning environment and a culture where people share skills are key to making digital transformation work. When employees feel supported to learn new things and share what they know, they're more ready to adapt and try out new ideas. This doesn't just help individuals grow—it makes the whole organization stronger. By encouraging learning and teamwork, we can tackle new technologies together and handle the challenges of digital change more smoothly." Group J, participant no. 2*

cf. Group J, participant No. 2, COO of Fuji industry, strongly suggested that the digital

leaders should invest in the development of digital skills among employees. Managers should identify skill gaps, provide training programs, and foster a learning culture that supports the continuous development and adaptation to digital advancements through training programs, workshops, and access to resources that enhance employees' digital literacy and technical expertise. By equipping employees with the necessary skills, managers can ensure that they can effectively leverage digital technologies and contribute to the organization's digital transformation goals. Furthermore, providing employees with opportunities for learning and growth is essential for building their digital competencies and ensuring their readiness to adapt to the changing digital landscape.

By investing in training programs, workshops, and mentorship initiatives, managers can enhance employees' digital literacy and equip them with the necessary skills to navigate the digital transformation journey effectively, create platforms and processes for employees to share their experiences, lessons learned, and best practices related to digital transformation. Participant commented, by promoting a learning culture, managers can facilitate continuous improvement, innovation, and adaptation to emerging digital trends (*cf.* below). Recognizing and celebrating employees' contributions and achievements throughout the digital transformation process is equally crucial. That can be done through formal and informal rewards, promotions, public acknowledgments, and creating a supportive and inclusive work environment that values employee input and recognizes their efforts.

- **Leadership Advocacy and Inclusivity:**

To navigate the challenges of digital transformation and maintain competitiveness, organizations must adopt hybrid leadership strategies tailored to the complexities of the digital age. Hybrid leadership integrates remote and in-person management capabilities, combining technological proficiency with interpersonal skills to effectively lead employees across diverse work environments (Gronn, 2009). and Soleymani & Kouhpayeh (2023)

echoed that blend multiple leadership styles, strategies, or roles to effectively manage complex, dynamic, and often digitally driven work environments. This approach supports adaptability to the evolving nature of work while fostering a responsive and resilient organizational culture.

Effective leadership in digital transformation extends beyond providing vision and direction; it requires actively engaging all stakeholders throughout the process. Leaders play a critical role in articulating a clear and compelling vision that aligns the strategic objectives of digital transformation initiatives with the organization's broader business goals. Furthermore, a deep understanding of emerging technologies is indispensable, equipping leaders to make well-informed decisions regarding adopting digital tools, infrastructure, and platforms (*cf.* Appendix 7). These decisions should align with the organization's overall digital strategy to ensure coherence and maximize the impact of transformation efforts. Such leadership practices are essential for driving sustainable success in the digital era (Soleymani & Kouhpayeh, 2023).

Furthermore, influential leaders foster a culture of inclusion and collaboration throughout the digital transformation journey. This involves creating an environment where diverse perspectives are valued and actively sought, fostering stakeholder empowerment to contribute ideas and insights. This inclusive approach enhances decision-making, promotes a sense of ownership, and cultivates a high level of commitment among employees (Jaussi & Dionne, 2004). In addition to inclusivity, leaders invest in developing digital competencies within the workforce, tapping into collective intelligence and creativity. The organization provides comprehensive training programs and opportunities for upskilling and reskilling employees to meet the evolving demands of the digital era. By nurturing a continuous learning mindset, leaders enable their teams to adapt swiftly to technological advancements and market changes (Al-Mannaei *et al.,* 2023). Through this holistic hybrid leadership approach, organizations can navigate the complexities of digital transformation, seize new

opportunities, and establish themselves as agile and digitally mature entities in the ever-evolving business landscape of the 21st Century.

- **Persistent Performance Surveillance and Assessment:**

Based on both findings from focus group interviews and questionnaire surveys indicated that organizations should establish key performance indicators (KPIs) and metrics to effectively track the progress and impact of their digital transformation initiatives. Regular monitoring and evaluation of these metrics facilitate timely adjustments; help identify areas for improvement and assess the return on investment (ROI). The balanced scorecard (BSC) is a comprehensive strategic management tool, providing a framework to evaluate performance across multiple dimensions, ensuring alignment with organizational strategy. By translating digital transformation objectives into specific goals and performance metrics, the BSC enables organizations to measure progress and ensure that digital initiatives contribute to broader business objectives. It offers a holistic view of performance by considering financial, customer, internal process, and learning and growth perspectives, thereby supporting a balanced approach to digital transformation. Sharing BSC results with employees, management, and stakeholders promotes transparency, fosters a shared understanding of the transformation process, and encourages collaboration.

Organizations need to establish a clear budgeting plan to allocate resources effectively, considering technology investments, training programs, talent acquisition, and ongoing maintenance and support. Participants in groups A, C, and D (*cf. below*) unanimously emphasized the importance of robust accounting practices and monitoring mechanisms to assess digital transformation initiatives' financial impact and performance. Implementing

> *Participant 1: No control over a budget ain't got success and always overrun.*
> *Participant 2: Any control mechanisms must be transparent and have some matrix.*
> *Participant 3: Budget control is not an overnight mission; it is a battle in the storm.*

controls and metrics allows organizations to track progress, identify bottlenecks, and make informed, data-driven decisions. Through continuous monitoring and control of digital transformation efforts, organizations can optimize resource allocation, ensuring their initiatives' successful implementation and sustainability.

- **Ethical Background and Global Challenges:**

Global organizations encounter challenges related to diverse regulatory frameworks, data privacy laws, and geopolitical factors, significantly impacting their ability to undertake successful digital transformation initiatives. These findings align with and expand upon key concepts of ODT, particularly the interplay between environmental uncertainty and strategic organizational responses (Vial, 2019). The need for compliance, data security, and ethical practices highlights the importance of dynamic capabilities. The researcher echoed Teece (2007) that the core ODT theory emphasizes an organization's ability to sense, seize, and reconfigure resources in response to environmental changes. Additionally, the influence of geopolitical factors such as trade disputes and political instability underscores the relevance of institutional theory, mainly its focus on the pressures organization faces from external environments, including regulatory and socio-political forces (Miller *et al.,* 2004). The findings suggest that digital transformation success requires technological adaptation and strategic alignment with institutional requirements, which can enhance legitimacy and operational resilience.

This research extends these theoretical frameworks by demonstrating how organizations can effectively operationalize these concepts within a global context. For example, the emphasis on creating resilient digital systems and diversifying supply chains reflects the

practical application of resilience and adaptability theories within ODT. These strategies demonstrate how organizations can mitigate risks and align their transformation efforts with broader institutional and environmental demands, advancing the theoretical understanding of ODT in complex, multi-jurisdictional settings.

- **Long-term Resilience and Risk Mitigation:**

Integrating sustainability and risk management into digital transformation strategies provides valuable insights that extend foundational theories of Organizational Digital Transformation (ODT). A core tenet of ODT involves balancing technological advancements with organizational resilience and adaptability in dynamic environments. The findings emphasize the strategic significance of sustainability and ethical governance, aligning with stakeholder theory by highlighting organizations' need to address their actions' broader environmental and societal implications.

The researcher tended to agree that the comments from the focus group, post-transformation, mitigating cybersecurity risks emerge as a critical priority for sustaining organizational resilience and maintaining stakeholder trust, and this requires the implementation of comprehensive security protocols, routine vulnerability assessments, and targeted employee training to address dynamic and evolving threats. Equally important is ensuring compliance with data privacy regulations, particularly in cross-border contexts where diverse legal and cultural norms prevail. Organizations must adopt adaptive governance frameworks that reflect the principles of institutional theory, recognizing the significant influence of regulatory, societal, and cultural pressures on strategic and operational decision-making. Integrating cybersecurity and data privacy into these frameworks ensures alignment with external expectations while safeguarding the integrity and sustainability of digital transformation outcomes. Additionally, sustainability and corporate social responsibility (CSR), as highlighted by Machado *et al.* (2019), are linked to

the concept of shared value creation. Organizations integrate digital transformation with broader societal objectives by incorporating environmentally sustainable practices, minimizing digital waste, and engaging in community development initiatives. This alignment underscores the role of digital innovation as a catalyst for advancing environmental sustainability and fostering social progress.

The strategies employed by organizations during crises, such as the COVID-19 pandemic, provide valuable insights into resilience theory. These adaptive responses illustrate the development of dynamic capabilities that enable organizations to sustain operations and safeguard stakeholder interests amid adverse conditions. The findings provide a comprehensive framework for addressing interconnected global challenges by embedding sustainability and robust risk management within digital transformation processes. This approach reinforces established theoretical implications in organizational digital transformation (ODT) and enhances their applicability to contemporary organizational contexts. By doing so, the study offers actionable strategies that promote resilience, adaptability, and sustainability in an increasingly complex and dynamic global environment.

6.4 Recommendation of a Holistic Management Framework

Many organizations embark on the journey of digital transformation, which demands thoughtful self-evaluation to assess whether they are truly prepared for such a complex and sustained effort. They must reflect on whether their organizational structure, resources, and culture are aligned to support this challenging process, like ensuring their dragon boat is fully equipped and ready for a demanding race. In this context, a well-defined holistic management framework becomes essential for navigating the complexities of ODT (Figure 18). The three distinct stages of Pre-ODT, Execution, and Post-ODT are not merely procedural steps but serve as strategic pillars that provide stability, direction, and coherence,

ensuring the overall success of the transformation journey.

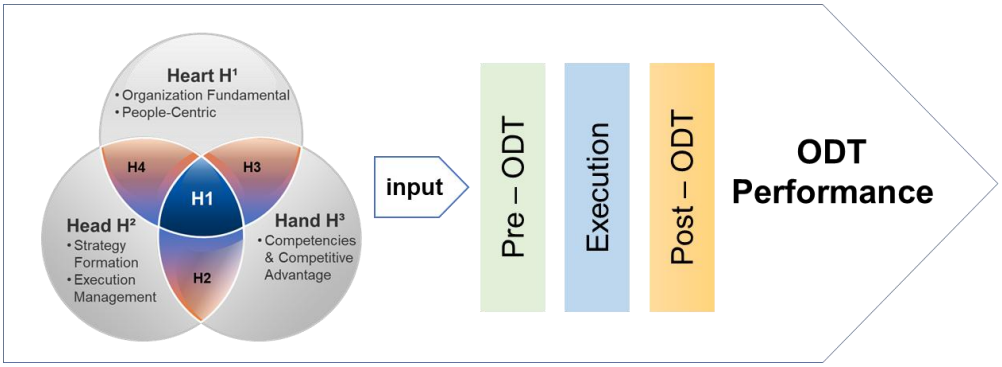

Figure 18: Proposed the 3H Holistic Management Framework for ODT – By Researcher

The Pre-ODT phase lays the foundation through careful planning and assessment, identifying challenges and aligning digital initiatives with business goals to create a clear strategic roadmap. The execution phase focuses on implementing strategies through effective coordination, resource management, and technological integration, ensuring alignment with organizational objectives. The Post-ODT phase involves reviewing results, measuring outcomes, and applying lessons learned to refine future strategies. This stage is not simply an endpoint but supports ongoing improvement, helping organizations stay adaptable and resilient in rapidly changing digital environments while fostering long-term growth and sustainable transformation.

While Yu's conceptualization of the 3H holistic framework is acknowledged, it is a valuable resource offering profound insights and guiding principles for researchers crafting ODT's management framework. These three stages are outlined within the framework, providing a comprehensive structure, ensuring that the organization navigates and thrives in the ever-changing digital ecosystem.

- **Pre-ODT**

> *"Preparing for pre-transformation processes is about making sure the organization doesn't revert to old habits. It's essential to embed the changes into the culture, have a monitoring system in place, and plan for continuous improvement." (Group F, No. 2 participant)*

The pre-ODT phase is essential as it involves the initial preparation and groundwork before embarking on the actual transformation (*cf. Appendix 13*). During this phase, organizations assess their current state, define their digital transformation goals and objectives, conduct feasibility studies, and develop a comprehensive strategy. With four steps, this strategy sets the direction for the transformation and aligns it with the organization's overall vision and objectives.

1. **Preparation Evaluation (H^2) and Change Management & Communication (H^1):** Successful digital transformation relies on strong change management and clear, consistent communication, which begins with detailed planning, assessing the organizational capabilities, and identifying areas needing improvement (Hannan & Baron, 2002; Ustundag & Cevikcan, 2017). However, planning alone is not enough. Actively involving stakeholders, such as leadership, employees, customers, and partners—is essential to building alignment and trust throughout the process (Appendix 9 – Group J, No. 1 participant). Open communication ensures that everyone understands the transformation's purpose, goals, and expected outcomes, reducing uncertainty and resistance. Supporting the findings of Hansen et al. (2011), the researcher suggests that creating opportunities for dialogue and feedback strengthens collective ownership of change. By combining strategic planning with transparent communication and inclusive engagement, organizations can guide their people through complex changes, fostering shared responsibility and ensuring a smoother, more successful transformation journey.

2. **Assessment of Data & Infrastructure (H^2) and Workforce Proficiencies (H^3):** A

thorough evaluation of an organization's technological infrastructure and workforce capabilities is essential for successful digital transformation. Assessing existing systems, technologies, and digital assets helps identify areas needing improvement, upgrades, or replacement to ensure alignment with transformation objectives. Equally important is evaluating workforce skills to identify gaps in digital competencies, which allows organizations to strategically align resources and determine whether to upskill current employees or recruit new talent with the necessary expertise (*cf.* Appendix 14). This dual assessment of technology and talent forms a critical foundation for ensuring that both infrastructure and human capital are prepared to drive and sustain transformation efforts (Hansen *et al.,* 2011). Furthermore, organizations must consider the investment required to enhance technological capabilities and ensure that both systems and skills are fully integrated to meet the long-term goals of digital transformation.

3. **Optimal Resource Assignment (H4):** Sebastian et al. (2017a) emphasized the critical role of strategic resource allocation in the success of organizational change initiatives, which means judiciously allocating financial and human resources to support the ODT journey effectively. Organization entails developing a comprehensive budget considering the required investments in technology infrastructure, talent acquisition, and training programs (Ustundag & Cevikcan, 2017). Although the quantitative findings for H4 did not fully support the research hypothesis, however, both the literature and qualitative insights indicate that resource optimization is significant. Furthermore, organizations are encouraged to explore opportunities for collaboration with external partners, such as technology vendors, consultants, and industry experts, to leverage their expertise and resources. These partnerships can foster accelerated progress in the digital transformation process by tapping into external knowledge, innovative solutions, and collaborative networks (*cf. Appendix 15*). By astutely allocating resources and engaging in strategic collaborations, organizations can optimize their digital transformation efforts and position themselves as agile, innovative

entities within the evolving business landscape. These findings suggest that aligning resources and building strategic partnerships can enhance organizational agility, innovation, and long-term digital transformation success.

4. **Risk Examination and Mitigation (H2):** In the process of ODT, identifying and managing risks are critical for ensuring the transformation journey's smooth progression and successful outcomes. Through rigorous research and analysis, this study's investigation emphasizes the importance of conducting a comprehensive risk analysis. Organizations must assess and evaluate potential risks and challenges that may arise throughout the digital transformation process (Beer *et al.,* 2005). Key focus areas include data security, privacy considerations, regulation compliance, and potential operational disruptions. Subsequently, organizations must develop robust risk mitigation strategies to address and mitigate these identified risks proactively. By implementing effective risk management measures, organizations can safeguard critical assets, protect sensitive data, and maintain operational continuity during the digital transformation (*cf. Appendix 16*).

- **Execution**

In the transformative journey of ODT, the "Execution" phase represents a pivotal stage where planned strategies are operationalized. This phase involves implementing advanced technologies, redesigning processes, extensive employee training, and structured change management efforts. To ensure the success of this critical phase, organizations should prioritize effective project management and establish strong stakeholder engagement frameworks. Continuous monitoring and evaluation mechanisms are also essential to maintain alignment with strategic objectives and adapt to emerging challenges. By effectively managing the complexities of execution, organizations can maximize the impact of their digital transformation initiatives and secure sustainable success in a rapidly evolving business landscape.

To achieve success in the "Execution" phase, organizations should focus on the following key areas:

1. Change Strategy (H^2) and DT Leadership (H^1): Employ change management strategies and demonstrate effective DT leadership to address resistance, mitigate risks, and facilitate the adoption of digital changes within the organization. Organizations should offer comprehensive transformation strategies and robust support mechanisms to empower employees in navigating the process, establish transparent and efficient communication channels to ensure effective dissemination of information and promptly address any emerging challenges or barriers. Demonstrating strong leadership capabilities and effective communication skills are vital for inspiring and motivating employees throughout the digital transformation journey. Like *'Wu Wei'*, which with effortless action, fosters spontaneous transformation without force or manipulation. Leaders enable digital transformation to unfold organically by aligning with natural organizational rhythms. This approach nurtures progress, emphasizing adaptability and harmony, allowing technologies and teams to evolve together, and creating sustainable change through non-intrusive, cooperative strategies that respect existing dynamics. Instilling a sense of urgency, articulating the transformative benefits, and fostering a culture encouraging employees to embrace change are pivotal components of successful change leadership (*cf. Appendix 17*).

2. Dynamic Project Execution (H^3) and Implementation (H2): To effectively execute a digital transformation plan, organizations should implement identified strategies and initiatives within an agile project management framework. This approach facilitates the deployment of advanced technologies, the redesign of existing processes, and the cultivation of organizational cultural change. 'Sun Tzu', people-centric management, advocating a balance between structured frameworks and agile adaptability. In ODT, this principle ensures leaders harness collective strengths, foster collaboration, and maintain strategic flexibility. Organizations achieve innovation and resilience by aligning human

potential with adaptive approaches while effectively navigating dynamic technological and market landscapes. Agile methodologies enable organizations to leverage flexibility, adaptability, and seamless collaboration across cross-functional teams. Breaking larger initiatives into smaller, manageable projects with clear milestones and deliverables is crucial to ensuring precise execution and measurable progress (*cf. Appendix 18*). This structured yet adaptive approach enhances the effectiveness of implementation efforts, driving the successful realization of digital transformation objectives.

3. **Data-informed Decision Making for Customer Excellence (H2):** Utilizing data analytics and insights to inform decision-making with a customer-centric approach emerges as a critical factor for success. By harnessing the power of data analytics and insights, organizations can make informed decisions throughout the digital transformation journey. The collection and analysis of relevant data to measure progress, identify bottlenecks, and make data-driven adjustments to optimize outcomes. An integral aspect of this approach involves strongly emphasizing understanding customer needs, preferences, and expectations. By incorporating customer feedback and insights into the design and implementation of digital initiatives, organizations can enhance customer experience, foster greater satisfaction, and drive long-term success in the dynamic digital landscape (*cf. Appendix 19*).

4. **Progressive Iterative Improvement (H^2):** Continuous monitoring and optimization are critical to organizational success, particularly during the execution phase of digital transformation (Matt *et al.,* 2015). Based on the focus group's participants' suggestions and comments, a proactive approach enables organizations to track the progress of their digital initiatives in real time, evaluating their impact on overall performance. Effective digital transformation management requires systematic collection of relevant data, rigorous analysis of outcomes, and timely adjustments to optimize results and ensure alignment with broader business goals (Vial. 2021).

As emphasized by focus group participants, fostering a culture of ongoing monitoring, evaluation, and optimization allows organizations to remain agile, respond to emerging challenges, and leverage new opportunities. According to the 'Sun Tzu' principle, well-designed progress management emphasizes command and monitoring within structured norms to ensure a seamless action process. Leaders ensure that processes align with strategic goals by establishing clear directives and maintaining oversight. This disciplined approach minimizes disruptions, fosters accountability, and provides technological integration to support organizational stability and long-term success. This iterative process strengthens transformational efforts, drives innovation, and sustains long-term success. By integrating these strategic practices during the "Execution-ODT" phase, organizations can better navigate the complexities of digital transformation, ultimately maximizing the value derived from their initiatives.

- **Post-ODT**

The post-ODT phase is essential in sustaining digital transformation and maximizing its long-term value. Drawing on the 3H holistic management framework, the researcher adopts a multidimensional approach to ongoing transformation management. The Heart domain promotes an adaptive organizational culture by deepening employee engagement and aligning leadership around shared values. The Head domain enables systematic evaluation through data-driven decision-making and strategic recalibration. Meanwhile, the Hand domain introduces practical mechanisms for continuous monitoring, iterative feedback, and agile refinement. This integrative framework fosters adaptability, organizational resilience, and a culture of constant improvement, positioning digital transformation as a sustained, strategic journey rather than a discrete event.

1. **Strategic Performance Measurement (H^2):** The strategy map developed by Kaplan and Norton provides a structured framework for defining, executing, and managing ODT

strategies. Findings from the hierarchical regression analysis of the Head domain confirm the significance of strategic planning and evaluation in determining digital transformation success. Specifically, assessing digital transformation outcomes against predefined objectives is essential for measuring strategic effectiveness and identifying areas for improvement.

Focus group participants also emphasized the importance of establishing key performance indicators (KPIs) and performance metrics to track the success and impact of transformation initiatives continuously. It aligns with Fenech *et al.* (2019) and Lockett & Thompson (2001), who were highlighted that systematic performance assessment is fundamental to evaluating organizational progress. The regression results further reinforce that organizations benefit from data-driven decision-making, allowing them to monitor transformation progress, refine strategies, and optimize long-term outcomes. By integrating structured performance measurements, organizations can enhance strategic alignment, strengthen decision-making processes, and sustain the success of their digital transformation efforts.

2. Sustaining Digital Transformation Initiatives (H1): Develop a comprehensive plan beyond the initial implementation phase, this plan entails the establishment of robust governance structures, creating processes for ongoing monitoring and maintenance, and cultivating a mindset characterized by agility and adaptability. These measures are necessary to ensure that the organization maintains its digital competitiveness in the long term. By proactively developing a strategy for sustaining digital transformation, organizations can navigate the ever-evolving landscape of technology and business dynamics, effectively respond to emerging challenges, and capitalize on new opportunities (*cf. Appendix 20)*. This approach fosters an environment of continuous improvement and innovation, enabling the organization to adapt to changing circumstances and maintain its digital advantage.

3. **Continuous Evolution (H2) and Disruptive Advancements (H1):** Establishing a culture of continuous improvement is essential for organizations undergoing digital transformation, requiring the systematic integration of feedback and lessons learned. Walumbwa *et al.* (2008) emphasized that embracing Kaizen principles and disruptive innovation fosters adaptability and sustains progress throughout the transformation process. Encouraging innovation, experimentation, and ongoing learning ensures organizations remain responsive to evolving technologies and dynamic market trends (*cf. Appendix 21*). By embedding a culture of innovation and experimentation, organizations can drive continuous enhancement, harness employee insights, and sustain competitive advantage in digital innovation. Employees should be actively encouraged to contribute ideas, explore emerging technologies, and identify opportunities for digital advancement across various operational areas. A strong commitment to creativity, agility, and forward-thinking enables organizations to embrace transformative change, capitalize on digital advancements, and achieve long-term, sustainable growth in an increasingly technology-driven business environment.

4. **Adaptive Knowledge Stewardship for Collaborative (H1):** To enhance the scalability and flexibility of digital transformation initiatives, organizations should adopt adaptive knowledge management strategies that support future growth and evolving business demands. A proactive approach to planning for technological advancements and market trends is essential for maintaining a competitive advantage. Therefore, organizations should implement structured mechanisms to capture, organize, and disseminate knowledge generated throughout the transformation process. Establishing a centralized repository for best practices, lessons learned, and success stories is recommended to facilitate knowledge transfer and promote a culture of continuous learning (Buil *et al.,* 2019). To achieve successful digital transformation, organizations should integrate adaptive knowledge stewardship with leadership-driven collaboration. Leadership should play a strategic role in

fostering a learning-oriented culture, encouraging knowledge sharing, adaptability, and collective success (Ustundag & Cevikcan, 2017). It is advisable for leaders to champion agility, ensuring that knowledge is effectively curated, shared, and applied to drive innovation and informed decision-making. Additionally, collaborative engagement among stakeholders should be prioritized to strengthen organizational resilience and long-term sustainability. By embedding adaptive knowledge management into leadership practices, organizations can navigate change more effectively and build a strong foundation for sustained transformation success. Per below the suggestion from participants of the focus group.

> *In my view, knowledge management is important for making digital transformation both scalable and flexible, that allowing organizations to keep the growth pace with changing business needs. I believe that taking a proactive approach to planning for technological advancements and market trends is key to staying competitive. Organizations should have well-structured systems to capture, organize, and share knowledge gained throughout the transformation process. Setting up a centralized repository for best practices, lessons learned, and success stories would, in my opinion, be a valuable way to encourage knowledge sharing and a culture of continuous learning. (Group D, No. 1 participant)*

> *In digital transformation, I think organizations must combine leadership-driven and all functional collaboration. Leaders should take an active role in fostering a learning-oriented culture by promoting knowledge sharing, adaptability, and collective growth. I personally believe that leaders need to champion agility, ensuring that knowledge is curated, shared, and applied in ways that drive innovation and informed decision-making. At the same time, engaging stakeholders in a collaborative process can help organizations build resilience and long-term sustainability. (Group F, No. 1 participant)*

Organizations should also ensure that adaptive knowledge management is deeply integrated into their digital transformation strategies to provide employees with actionable insights, enhancing agility and responsiveness to evolving challenges and opportunities. This approach fosters continuous improvement, allowing organizations to anticipate disruptions, refine strategies, and optimize performance. Furthermore, cultivating an adaptive knowledge culture ensures that digital initiatives remain relevant, aligned with business objectives, and capable of scaling alongside market evolution. By fully embracing adaptive knowledge management, organizations can strengthen operational resilience and position themselves at the forefront of industry innovation. A sustained approach to knowledge sharing and leadership-driven collaboration is critical to sustaining a competitive edge in a rapidly evolving digital landscape. Organizations are encouraged to adopt strategic

knowledge integration to leverage emerging opportunities, drive transformation, and establish a leadership position in the digital economy. See below the suggestions from the

> *In my opinion, digital transformation knowledge management should be an integral part of any digital transformation strategy to ensure staffs have access to actionable insights that enhance their ability to adapt to new challenges and opportunities. I believe that organizations that embrace continuous improvement can better anticipate disruptions, refine strategies, and optimize performance over time. (Group C, No. 2 Participant)*
>
> *To me, fostering a culture of knowledge sharing is essential for keeping digital initiatives relevant and aligned with business goals while allowing them to scale alongside market changes. By fully integrating technologial and transformational knowledge management, I believe organizations can enhance operational resilience and stay ahead in a constantly evolving industry. This consistent approach to maintaining a competitive edge in today's digital landscape. Organizations that focus on strategic knowledge integration will be better positioned to leverage new opportunities, drive transformation, and establish themselves as leaders in the digital economy. (Group F, No 3 Participant)*

participants in the focus group interview.

By incorporating the Pre, Execution, and Post strategies, organizations can easily and adeptly navigate the intricate landscape of digital transformation. These comprehensive strategies serve as guiding principles, enabling organizations to plan and execute with precision, and sustain the transformational journey over time. Embracing the Pre-ODT strategy ensures a robust foundation by conducting thorough assessments, engaging stakeholders, and fostering a shared vision. The Execution phase facilitates implementing planned initiatives effectively, encompassing technological deployment, process reengineering, employee training, and change management. Lastly, the Post-ODT strategy focuses on sustaining transformational outcomes, optimizing benefits, and continuously refining digital initiatives. By adhering to these strategic approaches, organizations proactively address challenges, seize opportunities, and position themselves competitively in the digital era. The PEP-ODT strategies collectively contribute to the success of digital transformation initiatives, serving as a framework that guides organizations throughout their transformative journey. The researcher proposes the process of 3H Holistic Management framework for ODT which mirrors with Yu's 3H framework *(Figure 19).*

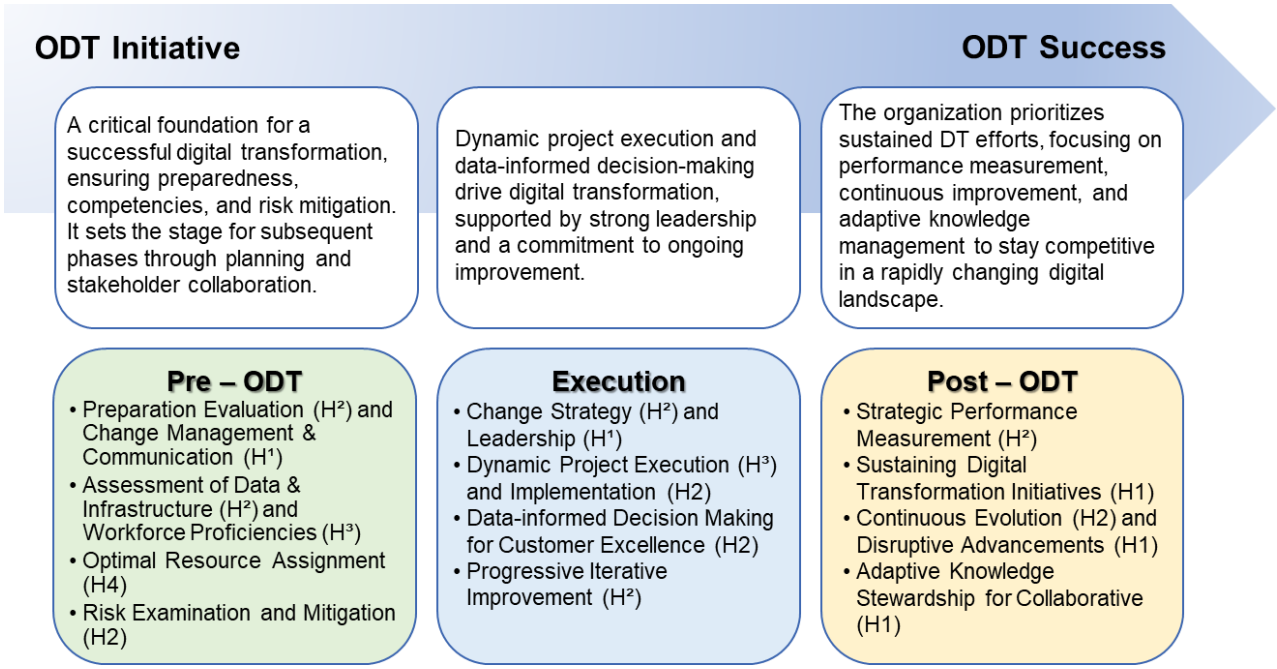

Figure 19: The processes of 3H Holistic Management Framework for ODT – By Researcher

6.5 Conclusions

This research has been undertaken to develop a comprehensive management framework encompassing the diverse and intricate aspects of digital transformation for organizations. The research findings acknowledge digital transformation's intricate and multifaceted characteristics; this comprehensive framework integrates a diverse array of 3H domains. The Heart dimension of the framework emphasizes the emotional and cultural aspects of digital transformation. It recognizes the importance of cultivating a positive organizational culture that embraces change, encourages collaboration, and fosters employee engagement. Insights from this research shed light on the significance of aligning the values and beliefs of individuals with the organization's digital transformation goals, thus creating an environment conducive to innovation and adaptation. The Head dimension focuses on the cognitive aspects of digital transformation. It involves strategic thinking, data-driven decision-making, and aligning digital initiatives with organizational strategy (Yu, 2019, 2021).

Through this research, a deeper understanding of the strategic implications of digital transformation emerges, including the need to leverage data analytics, assess market dynamics, and make informed decisions regarding technology adoption and resource allocation. The Hand dimension encompasses the practical execution of digital transformation initiatives. It involves project management, resource allocation, and the implementation of operational tactics.

The researcher highlights the importance of effective change management strategies, agile project management approaches, and the optimization of operational processes in driving successful digital transformation efforts. This holistic approach acknowledges the interplay and interdependence of various factors that influence the success of digital initiatives. It provides a systematic and structured approach to align their technological investments, team capabilities, strategic objectives, and operational tactics with broader organizational goals.

This holistic management framework enhances organizations' digital transformation efforts by integrating diverse dimensions and complexities. It enables them to leverage emerging technologies, optimize human capital, adapt to market dynamics, and foster innovation. Emphasizing strategic alignment and effective governance, the framework underscores leadership, transparent communication, and ethical considerations to ensure responsible and sustainable technology use (Yu, 2019). By addressing these factors, organizations can mitigate risks, improve efficiency, and enhance performance in a digitalized environment (Stalk *et al.,* 2012). Ultimately, this framework provides a structured roadmap for evaluating, planning, and executing digital initiatives while continuously adapting to evolving digital landscapes. Its adoption positions organizations as agile, innovative, and digitally mature, equipping them to navigate the complexities of digital transformation effectively.

This research contributes to ODT by developing a holistic management framework that

integrates Yu's 3H conceptual model. By examining the interplay of its three dimensions, the study offers insights into the holistic nature of digital transformation and its managerial implications. This integrated approach enables organizations to navigate digital transformation challenges by aligning technological investments, team capabilities, strategic objectives, and operational tactics with broader goals. The tabulated data (*cf.* Appendix 22) concisely summarizes the research outcomes, demonstrating coherence and affirming the effectiveness of the employed methodology and the significance of the findings.

6.6 Research Limitations

Investigating the holistic management framework in ODT necessitates thoroughly examining the research limitations inherent in the study design, methodology, data collection, and analysis processes. By acknowledging and analyzing these limitations, researchers and practitioners can gain valuable insights into the scope and generalizability of the research findings and identify areas for future improvement and further investigation.

One primary limitation of this research pertains to sample size and representativeness. The study focused on a limited number of organizations, potentially constraining the ability to capture the diverse range of organizations undergoing digital transformation fully. Consequently, caution must be exercised when interpreting the findings and conclusions, as they may not readily apply to all organizational types or industries (Boddy, 2016). Another critical limitation to consider is the generalizability of the research findings, given the contextual specificity of the study, where it centered on a particular organizational setting or cultural context, the direct transferability of the findings to other settings may be limited (Wright, 2005). Factors such as industry characteristics, organizational culture, and geographical location can significantly influence the outcomes and efficacy of the holistic management framework. Thus, caution is advised when attempting to extrapolate the findings to different contexts.

Another notable limitation of this study is the potential presence of Common Method Bias (CMB), a challenge often encountered in quantitative research. This bias arises when data for independent and dependent variables are collected using similar methods or from the same respondents, potentially inflating correlations and relationships between variables (Austi & Alte, 2003; Richardson *et al.,* 2015). For instance, participants reporting on the effectiveness of digital transformation strategies and their perceived outcomes may overestimate or align their responses, resulting in distorted findings. This issue challenges the conclusions' validity, particularly in capturing the nuanced dynamics of digital transformation processes.

Although the researcher adopted a multi-method approach to address this limitation, incorporating data from diverse sources (e.g., managers, employees, or external stakeholders) and ensuring temporal or spatial separation in data collection. Furthermore, future studies could adopt statistical techniques, such as Harman's single-factor test or introducing a marker variable, could be employed to detect and account for the potential influence of common method bias (Fetters *et al*., 2013; Arshad *et al*., 2023). Despite these efforts, the inherent risks associated with CMB should be acknowledged when interpreting the findings of this study.

The accuracy and reliability of the collected data pose potential limitations, particularly given the reliance on self-reported survey and interview data, which may be susceptible to response biases and recall issues (Ridder, 2017). Social desirability bias, limited participant awareness, and response fatigue could further impact data validity (Wright, 2005; Blaxter *et al.,* 2010). Additionally, while the holistic management framework in digital transformation encompasses strategic, technological, and human dimensions, time and resource constraints may have restricted a comprehensive exploration of these complexities. Consequently, the findings may provide only a partial understanding of the factors influencing the framework’s success. Future research should examine each dimension more

in-depth to enhance the framework's theoretical and practical insights.

The present study was conducted within a specific timeframe, which may limit its ability to capture the long-term impacts and dynamic evolution of the 3H holistic management framework. Given that digital transformation is an iterative and continuously evolving process, the framework's effectiveness may fluctuate across different stages of the transformation journey. A longitudinal analysis over an extended period would provide a more comprehensive assessment of the framework's sustainability and effectiveness (Blaxter *et al.,* 2010). Additionally, various external factors, including market conditions, regulatory changes, technological advancements, and unprecedented disruptions such as the COVID-19 pandemic, may significantly influence digital transformation outcomes. However, this study did not extensively examine these external influences, limiting its ability to capture the broader contextual factors shaping ODT.

Though conceptually appealing, the 3H holistic management framework remains in its early theoretical stages. This exploratory study faced challenges such as an unstructured research process, untested hypotheses, and the absence of a standardized survey instrument. Despite these limitations, the study's hypotheses and qualitative insights provide a foundation for future confirmatory research. Additionally, the lack of comparative analysis with alternative management approaches limits assessing the framework's relative effectiveness. Future comparative studies are needed to enhance the robustness and generalizability of the findings. Acknowledging these limitations is essential for advancing scholarly understanding and refining the framework's theoretical foundations.

6.7 Suggestions for Future Research

In research endeavors, it is imperative to explore the influence of contextual factors and cultural considerations on the implementation and outcomes of the 3H holistic management framework, recognizing that diverse industries, organizational sizes, and cultural contexts

may impact its effectiveness and applicability. The researcher concurs with Verina and Titko (2019), who argued that investigating contextual factors allows researchers to offer tailored recommendations for organizations operating within specific industries or cultural settings, thereby enhancing the applicability and relevance of the framework. Furthermore, based on the study's findings, there is a clear need for a more in-depth exploration of organizational culture's role in the success of digital transformation efforts. This insight is crucial for refining strategies that align with the unique cultural dynamics of an organization.

Further research into the applicability of the 3H Holistic Management Framework should focus on examining how different organizational cultures (H^1) influence the adoption and effectiveness of the framework. Additionally, exploring the concept of change readiness within organizations (H^2) could provide valuable insights into employees' preparedness and willingness to embrace digital transformation initiatives. Understanding the factors contributing to employees' readiness for change is critical, as it can inform strategies to cultivate a positive and receptive organizational climate during the digital transformation process (Stalk *et al.,* 2012; Fitzgerald *et al.,* 2014). This line of research has the potential to uncover various dimensions of change readiness and identify targeted interventions to enhance employee engagement and commitment to the transformation outcome.

Benchmarking studies on the applicability of the 3H framework, comparing an organization’s digital transformation progress with industry peers, can provide valuable insights and drive performance improvement. Comparative analysis helps identify best practices, successful strategies, and areas for enhancement, enabling organizations to refine their approaches. This research will deepen understanding of digital transformation complexities, support the development of effective strategies, and contribute to advancing knowledge in the field, ultimately helping organizations navigate challenges and maximize the benefits of their transformation efforts.

※ The End ※

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Appendix 1b Questionnaire Survey Introduction and Disclaimer

DBA thesis topic: **Towards Developing a Holistic Organization's Digital Transformation Management Framework**

Dear Participants,

I am inviting you to participate in my doctoral thesis research by completing the following survey. This research investigates the factors affecting organizational digital transformation's success and failure. The following questionnaire will require approximately 5-10 minutes to complete. 【There is no right or wrong answer.】

The researcher is interested in your experiences and perceptions when working on an 【Organization's Digital Transformation (ODT)】. Please answer the questions based on an organization with which you work or are familiar.
The survey data will be treated in the strictest confidentiality. Results will only be reported on an aggregated level, and identifying individual respondents would not be possible.
An organization's digital transformation (ODT) is the incorporation of computer-based technologies into an organization's products, processes, and strategies. The type of digital transformation includes mobile technology, the Internet of Things (IoT), Robotics, Artificial Intelligence & Machine Learning, Cloud-Based computing, and so forth. This initiative can require an examination and reinvention of all facets of an organization, from supply chains and workflows to employee skill sets to customer interactions and value propositions to stakeholders.

誠意邀請閣下參與本人的博士論文的研究，目的是研究《企業數字化轉型 - ODT》成功和失敗的因素。以下調查問卷大約需要 15-30 分鐘才能完成。
本問卷並不存在對與錯的答案。
研究人員對您在從前在工作上，或從事的機構在數字化轉型（ODT） 時的經驗和個人看法感興趣。請根據您目前工作的企業機構或所認識的企業機構的總體看法來回答問題。調查數據將得到最嚴格的保密處理。結果將僅在匯總級別上和研究，絕不存放個別受訪者的資料。

企業的數字化轉型 （ODT） 是將電子數據技術整合到企業的產品、工作流程和策略中。企業數位化轉型的類型包括移動技術，物聯網 （IoT），機器人技術，人工智慧和機器學習，雲端運算等等。這重要的企業策略行動是需要配合和重塑企業內外部的各個方面，從供應鏈、工作流程到員工技能各個組合，優化客戶互動，從而為相關利益者和企業增加價值。

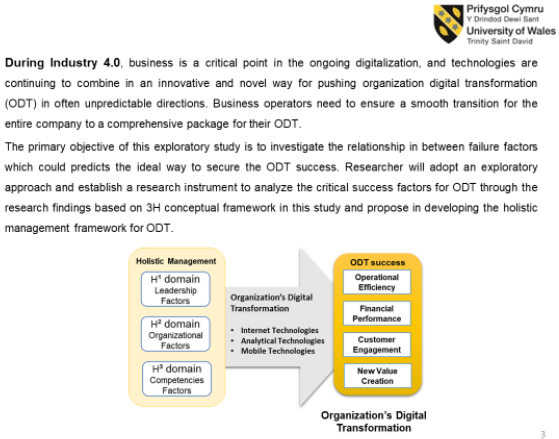
To support our society, the researcher will contribute and distribute donations of HK$50 with each survey filled to Tung Wah Group of Hospitals (e.g., 200 surveys returned X HK$ 50 = HK$ 10,000) 🙏👨‍👩‍👧‍👦😇

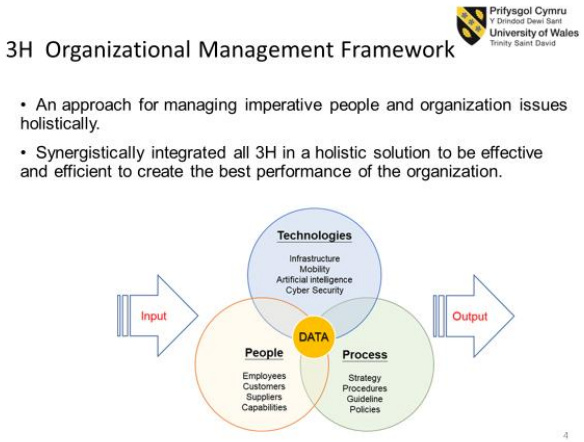
為支持社會公益，每一份問卷當完成後，研究人員將會按照問卷總數，向東華三院捐出每份問卷港幣50元。(例子: 200份 已填問卷 x HK$ 50 = HK$ 10,000)

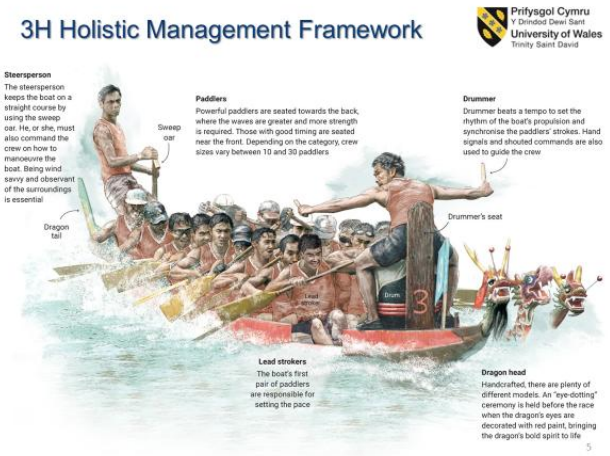
I acknowledge and understand this questionnaire is for research purposes.
本人明白並理解本問卷是出於研究目的。

- [ ] Yes 是
- [ ] No 否

Appendix 2: Focus Group introduction.







Organisational Performance OP =

1. $f(H^1 \cap H^2 \cap H^3)$ Adequacy and effective intersection of all 3H domains factors, Ideal case of holistic management as both necessary and sufficient conditions are fulfilled.
2. $f(H^1 \cap H^2 \cap \cancel{H^3})$ Deficiency of Hand domain factors
3. $f(H^1 \cap \cancel{H^2} \cap \cancel{H^3})$ Deficiencies of Head and Hand domain factors
4. $f(\cancel{H^1} \cap H^2 \cap H^3)$ Deficiency of Heart domain factors
5. $f(\cancel{H^1} \cap \cancel{H^2} \cap H^3)$ Deficiencies of Heart and Head domain factors
6. $f(H^1 \cap H^3 \cap \cancel{H^2})$ Deficiency of Head domain factors
7. $f(\cancel{H^1} \cap H^2 \cap \cancel{H^3})$ Deficiencies of Heart and Hand domain factors
8. $f(H^1 \cap H^2 \cap H^3)$ Have all necessary but insufficient condition due to weak intersection of H1 and H2
9. $f(H^1 \cap H^2 \cap H^3)$ Have all necessary but insufficient condition due to weak intersection of H2 and H3
10. $f(H^1 \cap H^3 \cap \cancel{H^2})$ Deficiency of Hand domain factors and weak intersection between H1 and H3
11. $f(H^1 \cap H^2 \cap H^3)$ Have all necessary but insufficient condition due to weak intersection of all 3H
12. $f(\cancel{H^1} \cap \cancel{H^2} \cap \cancel{H^3})$ Deficiency in all three H factors and weak intersection among all three H domains

8

Focus Group Guideline:

- Please note that there are no right or wrong answers to focus group questions;
- All your comments and thoughts are based on your own views and experiences;
- The Researcher wants to hear the many varying viewpoints and would like for everyone to contribute their thoughts;
- Out of respect, please refrain from interrupting others. However, feel free to be honest even when your responses counter those of other group members.

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1. How important of ODT for today's business environment?

- Please specify your industry and business environment

2. Based on your experiences, any disappointment and satisfaction of an ODT.

- Both Positive and Negative
- Why?

3. Based on your experiences, tell me about the key challenges of ODT

- Which relative and non-relative with Heart, Head, and Hand?

4. Based on your experiences and views, what are the key success factors (KSF) of an ODT?

- Which relative and non-relative with Heart, Head and Hand?

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5. What does ODT leadership needs to achieve ODT success? (e.g., leader style, capabilities, etc.)

- Such as personal traits and influence strategies that are considered effective leadership

6. What are the organization's key objectives and goals from their ODT?

- Which relative and non-relative with Heart, Head and Hand?

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7. What competencies should require for the working team?

- Did the organization's ODT team possess such competence? If no or inadequate, how did such weakness affect the ODT project outcomes?

8. 8) If you were in charge of the ODT, how would you improve the process?

- Which relative and non-relative with Heart, Head and Hand?
- And Why???

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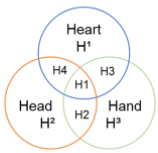
9. What are the most significant elements we have discussed today? (Open question)

- Which relative and with Heart, Head and Hand? And beyond 3H domains…..
- If integration of all 3 H domains to create the holistic ODT is a key ODT success factor for validating the formula:
  - ◆ODT success = **f (H1∩H2∩H3)**



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Appendix 3: The participants' response example of the question one.

Participants' response example of Question 1

"In today's competitive marketplace, it is imperative that F&B businesses embrace digital transformation to stay competitive and meet customers' changing needs and preferences. Digital technologies can meet the demand of customers' needs and enhance their experiences by providing new and innovative ways to order and pay for food, such as mobile technology and self-service kiosks." **(Group B, No. 2 participant)**

"Amidst today's dynamic business landscape, educational institutions must swiftly adopt digital transformation to equip students for tomorrow. Digital tools, spanning online platforms, gamification, and virtual reality, enrich learning by engaging students innovatively. Addressing personalized learning, ODT tailors' education to individual capacities. Efficiency heightens through automated administrative tasks and digitized processes, meeting industry demands. Data analytics further aid educators in refining teaching strategies. This view echoes Group E's initial participant." **(Group E, No. 1 participant)**

"As a financial executive, I have seen first-hand that digital transformation brings benefits by improving data analytics and reporting to streamlined processes and enhancing investors' engagement. After the success of ODT in my organization, we all gained the effectiveness and efficiency of business progress, reduced errors, and improved the accuracy of investment opportunities." **(Group C, No. 2 participant)**

Appendix 4: The participants' response example of the question two.

Participants' response example of Question 2

"I have experienced both sides of this journey firsthand. On the one hand, digital transformation can be incredibly disappointing when it fails to deliver the expected results. For example, investing in new technology may only sometimes lead to the desired efficiency or customer experience improvements. Additionally, digital transformation often requires significant organizational structure and culture changes, which can be challenging to implement and may only sometimes yield the desired outcomes. Moreover, the cost of digital transformation is high, and it may take longer than anticipated to see a return on investment. These challenges can lead to frustration and disappointment for executives and employees.

On the other hand, digital transformation can also be advantageous and satisfying when it is successful. When implemented effectively, digital technologies can streamline processes, increase productivity, and enhance the customer experience. For instance, investing in artificial intelligence and machine learning can help companies automate specific tasks and make more informed decisions. Cloud computing can provide greater flexibility and scalability while reducing costs associated with maintaining physical infrastructure. Furthermore, digital transformation can open up new business opportunities and revenue streams, which can be incredibly lucrative for companies." **(Group C, No. 2 participant)**

Participants' response example of Question 2

"As a General Manager of a China-based stereo-sound manufacturer, I have witnessed the ups and downs of our digital transformation journey. One of the biggest disappointments was our initial need for more understanding of the importance of digitalization, which resulted in missed opportunities to improve efficiency and enhance the customer experience. Another challenge we faced was balancing the long-term benefits of digital transformation with the short-term costs and risks. Digital transformation requires significant investment in new technologies, tools, and processes, which can be costly and time-consuming. It also involves taking risks and changing how things have always been done, which can be unsettling for some stakeholders.

One of the most exciting aspects of our digital transformation journey was the opportunity to innovate and differentiate ourselves from our competitors. By adopting new technologies and digital tools, we were able to develop new products and services that met the evolving needs of our customers. Another source of satisfaction was the positive impact of digital transformation on our employees. Our employees became more efficient and productive with new technologies and digital tools, leading to greater job satisfaction and motivation." **(Group H, No. 3 participant)**

Participants' response example of Question 2

"The disappointment from our digital transformation journey taught us the importance of a clear digital transformation strategy and vision. It also highlighted the need for effective communication and change management to ensure all stakeholders are on the transformation journey. While the disappointment was challenging to navigate, we used it as an opportunity to learn and improve our approach to digital transformation. Another source of disappointment was the resistance to change from some employees. Despite our efforts to communicate the benefits of digital transformation and provide training and support, some employees were hesitant to embrace new technologies or working methods, which created a barrier to adopting new digital tools and processes, slowing down our digital transformation efforts.

One of the biggest sources of satisfaction was the significant improvements in efficiency and productivity from adopting new digital tools and processes. We implemented robotic process automation (RPA) to automate repetitive and time-consuming manual tasks like claims processing and underwriting. Such not only improved the speed and accuracy of our operations but also freed up our employees to focus on higher-value tasks that require human expertise and judgment. That was the enhanced customer experience that came from our digital transformation efforts. Our digital transformation journey gave us the agility and flexibility to adapt to the rapidly changing business environment." **(Group J, No. 3 participant)**

Appendix 5: The participants' response example of the question Three

Participants' response example of Question 3

"My organization has legacy systems and infrastructure that need to be redesigned to work seamlessly with the new digital tools and platforms, thus leading to a significant integration challenge, which has a major delay in the implementation. Another challenge is the need for more digital skills and expertise among employees, which can lead to a skills gap and a lack of confidence. Inadequate project management and communication can also pose a challenge during digital transformation. Digital transformation projects are often complex and involve multiple stakeholders, departments, and vendors. With effective project management and communication, ensuring everyone is on the same page is hard, and working towards the same goals can be easy. Finally, a lack of executive buy-in and support can be a significant challenge. Without capable digital leadership, securing the necessary resources and funding and overcoming resistance to change from employees can be difficult." **(Group K, No. 2 participant)**

Participants' response example of Question 3.

"One of the key challenges is the need for more clarity in digital transformation strategy. Organizations may embark on digital transformation initiatives without a clear understanding of the business goals and objectives they are trying to achieve. Another challenge organizations may face during digital transformation is integrating digital tools and financial systems. Cybersecurity risks are also a major concern during digital transformation, particularly for organizations that handle sensitive financial data. Inadequate employee training and support can also pose a challenge during digital transformation. New digital tools and processes require new skills and knowledge that may need to be present within the organization. Finally, a lack of collaboration synergy and teamwork can be a significant challenge during digital transformation" **(Group E, No. 2 participant)**

Participants' response example of Question 3.

"As a financial advisor in China, I have observed that one of the critical challenges is the regulatory environment and compliance requirements for an organization's digital transformation. China has strict regulations governing the use and storage of financial data, and organizations must comply with these regulations when implementing new digital tools and processes. Another challenge that organizations may face during digital transformation is the need for access to digital tools and resources. Organizations adopting new digital technologies and platforms may become more vulnerable to cyber threats such as hacking, data breaches, and other cyber-attacks. Without adequate training and support, employees may struggle to adopt new digital tools and processes, which can hinder the success of the digital transformation initiative. Finally, employees' lack of digital skills and expertise can pose a challenge during digital transformation in an organization." **(Group A, No. 3 participant)**

Appendix 6: The participants' response example of the question Four

Participants' response example of Question 4

"As the Head of Human Resources of a retail company, I understand the importance of digital transformation in today's business landscape. First and foremost, a clear vision and strategy for digital transformation are essential. Our senior executives need to define our goals, identify the areas where digital transformation can bring the most impact, and develop a roadmap for implementation. Strong leadership and commitment from top management are also critical. We need leaders who understand the importance of digital transformation and are willing to invest time, resources, and energy to make it a success.

Another important success factor is the skilled and knowledgeable workforce to ensure our employees have the necessary skills and knowledge to work in a digital environment. This approach involves training and development programs, hiring new talent, or re-skilling our existing workforce. Effective communication and collaboration across all levels of the organization are also crucial, especially involving all stakeholders in the digital transformation process, including employees, customers, vendors, and partners. Cross-functional teams and a collaborative work environment ensure everyone is aligned and working towards a common goal.

In conclusion, the above success factors are critical to our organization's digital transformation. As the Head of Human Resources, duty-bound is committed to working with other departments to ensure we have the necessary resources, talent, and culture to make our digital transformation successful." **(Group F, No. 2 participant)**

Participants' response example of Question 4

"Here are some success factors that I believe successful digital transformation should have:

- *Before embarking on a digital transformation journey, a thorough cost-benefit analysis should be conducted to determine the potential return on investment (ROI) and ensure the investment is justified.*
- *Strong and practical financial management for this significant investment is critical.*
- *Digital technology can provide valuable insights into financial information, such as revenue, expenses, and profitability. Data analytics can help identify trends, measure performance, and inform decision-making.*
- *It is essential to have strong cybersecurity measures in place to protect financial data, prevent fraud, and maintain customers' trust.*
- *Digital transformation should integrate with existing financial systems to ensure a seamless transition and avoid disruptions in financial operations.*
- *Digital transformation should comply with regulatory requirements related to financial reporting, data privacy, and cybersecurity.*
- *Digital transformation is ongoing, continuous improvement is essential for sustained success. It is important to regularly evaluate the effectiveness of digital initiatives and make adjustments as needed."*

(Group D, No. 3 participant)

Appendix 7: The participants' response example of the question Five

Participants' response example of Question 5

"My experiences told me that achieving digital transformation success requires transformational leadership because that is the major transformation of an organization. They must inspire others to embrace digital technologies and define a clear vision aligning with the organization's goals. The leader should be able to allocate the necessary resources to support the company's digital strategy, including financial, human, and technology resources, creating cross-functional teams, encouraging collaboration and knowledge sharing, and providing incentives and rewards for innovation and experimentation. And they must be innovative and willing to take risks: 'No Risk, No Gain'." **(Group B, No. 3 participant, CEO of an Aviation Corporation)**

"Many digital transformations happened in the last 19 years during my career tenure. Most importantly, the leadership must be able to foster a culture that supports digital transformation. ODT is not an easy journey, and it needs to involve the entire organization; thus, he or she needs to inspire and motivate all employees and peers to become agents of change and embrace digital transformation, and prioritize continuous learning and development, encouraging employees to develop their digital skills and stay up to date with the latest technologies and trends. The cross-function communication must be effective and regular with their teams about the vision, strategy, and progress of digital transformation initiatives. And also need to manage human potential, provide individualized support for those working on the transformation process, and navigate the challenges of digital transformation and achieve success." **(Group A, No 2 participant, MD of a Global Hospitality Group)**

Participants' response example of Question 5

"The digital transformation leader must be a technology expert who must clearly understand the technologies and processes involved, such as hiring and skill training for the latest technologies and digital trends, and leveraging external expertise is necessary. Without clear metrics of measurement tools to monitor the transformation progress, this ODT could be an endless transformational journey. They must be process-driven individuals focusing on procedures, regulations, and policies, such as data privacy and cybersecurity requirements. A fundamental task is a clear expectation for the digital team with effective communication, strong guidance, and a drive for responsibility. They set specific, measurable goals for their team, which aligned with the digital transformation initiatives." **(Group G, No. 2 participant, IT Head of a global climate technology company)**

"Digital transformation leadership requires focusing on achieving specific goals and objectives through a structured approach. His style needs effectively drive change and achieve results. My opinions should be:

Able to communicate their vision effectively to all stakeholders, employees, customers, and investors. That helps ensure everyone is aligned and working towards the same goals. Strong technological experience and understanding of the technologies and processes. Must have great capability to understand the importance of data management and ensure that data is right for business decision-making and popper technologies select. Good sound judgment and consider all the available information and weigh the pros and cons of different options. Transplant converts the digital strategy into direction and processes that implement effectively. Define and setting clear KPIs and measuring process, such as balance score card and status quo reporting, and identify areas for improvement. Setting clear expectations and providing rewards and creating short-term wins to motivate the troop. Laissez-faire style in delegating authority and responsibility with expertise and experience to work independently." **(Group H, No. 3 participant, COO of a global high-end consumer goods company)**

Appendix 8: The participants' response example of the question Six

Participants' response example of Question 6

"Our primary objectives and goals of digital transformation are fundamental to our strategy for growth and innovation, which is based on digital technologies to enhance our competitiveness and create new value for our customers and stakeholders. IT team optimizes our operations and supply chain management by using data analytics and artificial intelligence for our production lines, logistics, and inventory management to streamline our processes, reduce costs, and improve efficiency. Another goal is to enhance our product and service offerings with emerging technologies such as the Internet of Things (IoT), blockchain, and 5G, integrating these technologies into our products and services to create new revenue streams and business models while improving customer experiences and satisfaction. Digital transformation can build our culture of innovation and agility, where employees are empowered to experiment and take risks to pursue new ideas and solutions." **(Group I, No. 2 participant, COO of Ctrip, China)**

"Our objectives and goals of digital transformation are critical to our mission of providing high-quality education, enhancing the learning experience, and preparing our students for success in the 21st century. We aim to enhance the accessibility and flexibility of our education programs by leveraging online and blended learning models and increasing the effectiveness of our teaching and learning processes through a data-controlling system and artificial intelligence. Digital literacy and technology skills development to prepare our students for success in the digital economy. To build and construct an innovation culture and collaboration among our educators and staff, encourage experimentation, and share best practices, enabling us to continuously improve our education programs and stay ahead of the curve in a rapidly evolving digital landscape." **(Group E, No. 1 participant, CEO of an education group in Vietnam)**

Participants' response example of Question 6

"When my company introduced the cloud-based ERP two years ago. Initially, our primary goal is to enhance the customer experience by leveraging digital tools and technologies to provide personalized and seamless service. We want to create a holistic dining experience that engages all the senses, from when customers make reservations to when they leave the restaurant. Another objective is enhancing our mobile ordering and payment capabilities, allowing customers to place and pay for their meals using smartphones. By analyzing data from our reservation system, social media, and other sources, we can identify trends and preferences and tailor our menu, promotions, and service to meet their needs. Overall, the objectives and goals of digital transformation are to improve operational efficiency and productivity, enhance brand reputation and customer experiences, increase speed and agility, enhance data analytics and decision-making capabilities, and increase competitive advantage." **(Group C, No. 1 participant, COO of F&B Group)**

Appendix 9: The participants' response example of the question Seven

Participants' response example of Question 7

"I believe that the success of digital organizational transformation (ODT) relies heavily on the competencies of the working team. With digital transformation comes change, and team members must be able to adapt to new processes, technologies, and ways of working. This transformational process often involves cross-functional teams and collaboration across different departments, so team members must have good communication skills. In today's digital environment, data is king; they need to deal with data analysis for their decisions and drive business outcomes. Most important, team members must be comfortable with technology and have a solid understanding of digital tools and platforms from basic computer skills to more advanced knowledge of programming languages and data analytics." **(Group H, No. 2 participant, Human Resources Director of a Global Consultancy Firm)**

"Participants' response example of Question 7

In my past experiences in the real estate industry, my views of competencies that are essential for a digital working team in the context of digital organizational transformation (ODT) is project management, which to manage projects effectively, using digital tools, resources, and human resources to track progress, communicate with stakeholders, and manage risk during the transformation. Team members need the ability to analyze the data, largely from demographic and market data to financial and performance data, to help their decisions of implementation and drive the transformation outcomes. Most importantly, they must avoid the habit of 'Over promised and under-delivery.'. And they also need an ongoing learning mode and development and a willingness to invest in the knowledge and technologies necessary to support their digital transformation." **(Group J, No. 1 participant, Real Estate developer in mainland China)**

Participants' response example of Question 7

"Here are some suggestions for competencies of the digital transformation team that are particularly relevant to the accounting industry. Team members must have the technical expertise for digital transformation because it involves using advanced technologies such as cloud computing, artificial intelligence, and blockchain. They also must know about the latest regulatory requirements and standards and be able to ensure that digital transformation efforts comply with these requirements. Team members need a deep understanding of audit and assurance principles and be able to apply these principles to digital transformation efforts, including ensuring the accuracy and reliability of data and identifying and mitigating risks associated with digital transformation." **(Group E, No. 2 participant, Senior Partner of KPMG)**

Appendix 10: The participants' response example of the question Eight

Participants' response example of Question 8

"As the IT Head of a stock brokerage for over twenty-five years and through three digital transformations, I suggest several strategies to improve the organization's digital transformation. First, we must develop a clear digital strategy to ensure the planned digital transformation is aligned with business goals and market trends. We must have enough financial budgeting to support the change. Secondly, it's important to foster a culture of innovation and collaboration within the organization, which includes setting up an innovation team to encourage team members to develop new ideas and solutions and foster collaboration across functional units. And also essential to provide training and development opportunities to staff to ensure they have the skills and knowledge needed to drive digital transformation. Invest in talent development to ensure that teams can handle the needs to drive digital transformation initiatives. Establish clear roles and responsibilities for all relative parties to execute effectively to avoid confusion and ensure everyone understands their duty. Another critical step is a streamlined internal process with a clear KPI for each process which aims to reduce manual errors, increase efficiency, and free up staff to focus on more value-added activities. Lastly, leverage data analytics to identify patterns in predicting investment behavior and provide business recommendations; and invest in robust cyber security measures to ensure the security of customer information and transactions is paramount, such as multi-factor authentication, encryption, and regular security audits." **(Group D, no. 1 participant, IT Director of a Global Financial company)**

Participants' response example of Question 8

"A clear digital strategy details the organization's vision, goals, and objectives for digital transformation and the key initiatives and projects' progress that will be taken as our industry is FMCG, a customer-centric approach that emphasizes customers' expectations and personalized experiences tailored to their needs. Ensuring that all digital initiatives focus on enhancing the customer experience is important. ODT requires a culture of innovation and experimentation. Developing partnerships with digital companies can provide access to new technologies and expertise and invest in staff training and development for new skills and knowledge. Most importantly, digital leadership is the sprite of the ODT, who must have holistic management skills such as resources management, team building, agility methodology, ability to convert strategy to reality, reward and recognition management, project management, monitoring, and controlling. They must be inspirational to motivate the team to achieve transformational goals." **(Group D, No. 2 participant, CMO of a global FMCG)**

Participants' response example of Question 8

"An organization's digital transformation is not a simple process; it involves multiple dimensions and many challenges during its implementation processes. Based on past experiences, the organization should develop a strategic digital transformational plan with dedicated leadership to manage the change. In technological aspects, the digital strategy should include data analytics methodology, core digital team and technical expertise, digital landscaping, core technologies, a robust cyber security system to avoid any hackathons and leverage emerging technologies such as AI, cloud computing, IoT, and advanced application and devices. Regarding management and operation concerns, digital leadership must have an innovation and risk-taking mindset, strong Project Management Professional (PMP) and change management capability, effectiveness in team building, and solid collaboration and communication internally and externally for better business engagement. My past experiences told me that pre-transformation tracking and measurement are critical for the success of DT implementation. Still, post-transformation monitoring is critical for the organization because of the continuity of digitalized growth and sustainability. The steering committee of ODT is another critical element to improve the transformation, and last but not least is the financial support. My past experiences showed that all digital transformation projects are budget overrun by a high double-digit percentage, thus, ensuring that good strategical projects will not be killed by insufficient funding support. The digital leader must convince and sell the digital transformation to stakeholders in exchange for indispensable support." **(Group a, No. participant, Founder and CEO of GoGo Van)**

Participants' response example of Question 8

"A successful transformation must have a clear and transplant digital transformation roadmap with good financial support from executives to outline the organization's vision, goals, and objectives for digital transformation, as well as the key initiatives and projects that will be undertaken to achieve those goals. Building a solid digital team mixed with technical and business skills is very important to ensure the processes meet the standard. Develop a digital talent strategy to secure and support the organization has the right people with the right skills to drive the transformation. This approach may include hiring new staff, upskilling existing staff, and developing partnerships with external organizations. A successful change can only live with other departments to support, thus establishing a digital center of excellence to drive digital transformation, providing guidance, support, and expertise, and encouraging collaboration and open communication for information-sharing across the organization. The digital leader must emphasize agility and speed as technology evolves. It's essential to measure and track progress towards digital transformation progress, using metrics such as Balanced-Score Card, key performance Indicators (KPIs), Customer Satisfaction Score (CSAT), Employee Engagement Index (EEI), and most stakeholders' preference – Return on Investment (ROI), that can ensure the digital transformation processes are on track and delivering value to the organization. Finally, cybersecurity is a critical aspect of digital transformation, and it's crucial to ensure that cybersecurity measures are in place to protect the organization and its customers." **(Group K, No. 2 participant, Chief Engineer of a global technology company)**

Appendix 11: The participants' response example of the question Nine

Participants' response example of Question 9

The most senior retired participant, who had worked in the financial industry for over forty-eight years, he claimed more than seven digital transformations in his career journey. The participant responded that although the 3H management framework is conceptual, he can reflect on and apply his past experiences in an organization's digital transformation in the following example.

In the Heart dimension, leadership should rely on their emotional intelligence to motivate and engage employees in digital transformation. It involves communicating the importance of digital transformation and helping employees to understand how their work contributes to the organization's digital transformation goals. Managers can also create a positive digital culture that promotes learning and development and rewards employees for contributing to digital transformation initiatives.

In the Head domain, the organization or digital leader can use analytical skills to identify the digital skills and competencies needed for digital transformation success. That can involve conducting a skills gap analysis to identify areas where the organization needs to build skills and competencies related to digital transformation, such as data analytics, digital marketing, or software development.

In the Hand domain, leadership must develop training and development programs to build the digital skills and competencies required for success of digital transformation. That can involve offering training and development opportunities such as workshops, online courses, or mentoring programs to help employees build the skills they need to succeed in a digital environment. Managers can also provide opportunities for employees to work on digital transformation initiatives and gain hands-on experience with new technologies and tools." **(Group D, No. 3 participant, Ex-Managing Director of a Financial company)**

Participants' response example of Question 9

"Digital transformation needs a clear strategy formation, as like the Head domain, leaders can use analytical and strategic thinking skills to develop a clear digital transformation strategy, implement the strategy practically, and develop a roadmap for digital transformation and monitoring progress. In the Heart domain, the organization delivers this strategy effectively to employees and stakeholders, using emotional intelligence to inspire and engage them. And in the Hand domain, all team members should focus on achieving the transformation objectives with their on-ground capabilities and build a substantial competitive advantage for the organization." **(Group B, No. 1 participant, CEO of an investment company in Singapore)**

Participants' response example of Question 9

"Change management for ODT is toward the Heart domain and relies on emotional intelligence to manage the emotional aspects of change, helping employees navigate the challenges of digital transformation. My company, a multinational conglomerate based in Germany, we had implemented an Internet Data Center (IDC) in its innovation practices. The company has developed a culture of innovation that encourages employees to experiment with new ideas and technologies, and this practice is more in the Heart domain. This culture is based on the idea that employees should use their Head (analytical skills) to identify emerging technology trends and opportunities for innovation, their Heart (creativity and innovation skills) to develop new ideas, and their Hand (practical skills) to implement and scale innovative initiatives." **(Group H, No. 3 participant, COO of a multinational conglomerate based in Germany)**

Participants' response example of Question 9

"Talent management is essential for sustainable organizational growth. Managers can use their emotional intelligence to motivate and engage employees in the digital transformation process related to the Heart domain. In the Head domain, use analytical skills to identify the digital skills and competencies needed for digital transformation success. And the development of training and progress programs to build the organization's core competencies." **(Group F, No. 2 participant, CHRO of a global trading company)**

Appendix 12: The Questionnaire Survey

No.	Construct Operationalization	**Please indicate the level of agreement or disagreement to the following statements. (1-35)** *Strongly disagree (1) - Disagree (2) - Neutral (3) - Agree (4) - Strongly agree (5)* **請說明同意或不同意以下陳述的程度。(1-35)** 強烈不同意 (1) - 不同意 (2) - 中立 (3) - 同意 (4) - 強烈同意 (5)
1	Creativity & Innovation	Our ODT team members remain open to new ideas and innovation 我們的數字技術團隊成員對新的想法和創新持開放態度。
2	Control & Compliance driven	My organization is very controlled and structured, and formal procedures generally govern what people do. 我的企業機構注重流程合規管理政策，從而管理日常工作。
3	Effective Communication	My organisation has been meticulous in aligning vertically and horizontally of divisions and units to effectively implement strategies. 我的企業機構保持一絲不苟地，垂直和扁平地協調部門和單位，以有效地實施轉型策略。
4	Top Management Commitment	My organization has a clear management commitment and effective leadership from the CEO dacross all levels of management. 我的企業機構有明確的管理承諾，能有效地從首席執行官實施到整個管理層。
5	Leadership Motivation	Our ODT project leader creates and fosters a motivational culture that encourages employee commitment to implementing ODT processes. 我們的數位化轉型領導者於實施ODT流程中，創造並孕育一種互相激勵文化。
6	Trust, Diversity & Inclusion	There is a high level of trust between management and workers in my organization. 我的企業機構在管理層和員工之間具有很高的信任度。
7	Effectiveness Transactional leadership	Our ODT project leader can efficiently coordinate, organize, and smooth-running among different function units on goal accomplishment. 我們的數位化轉型項目負責人能夠有效地協調、組織和平穩運行不同職能部門，從而實現目標。
8	Transactional leadership and communication	Our ODT project leader can communicate facts and ideas clearly, convincingly, and organized manner across the organization. 我們的數位化轉型項目負責人能夠清晰地，令人信服和有條理地，向全公司傳達事實和想法。
9	Sense of Achievement for Motivation	Our ODT project leader promotes more "short-term wins" that positively impact the organization's move toward the overall change goals. 我們的數字化轉型項目負責人提倡更多的「短期勝利」，能夠對實現整體變革目標產生了積極影響。
10	Effective Process management	Our ODT project leader has effectively translate the digital transformation strategy into actionable activities across the organisation. 我們的的數字化轉型項目負責人能有效地把數位化轉型策略轉化為實際的操作行動，給予公司整體上下。
11	Innovative and Daring Work Atmosphere	Our ODT project leader creates an environment that encourages, recognizes, and rewards risk-taking, creativity, and innovation. 我們的數字化轉型項目負責人會創造一個鼓勵冒險、創造力和創新的工作環境。
12	Heart-to-heart Transformational leadership	Our ODT leader is a 'heart-to-heart' leader with a spirit that motivates and nurtures others to succeed in digital transformation. 我們的數字化轉型項目負責人，是一位心連心的領導者，他具有激勵和栽培他人成功實現數字化轉型的精神。
13	Core Competency and Capabilities	Our ODT leader project leader has sufficient technical knowledge to lead the digital transformation projects. 我的企業機構的數字化轉型項目負責人擁有足夠的知識技術、來主導數字化轉型專案。
14	TQM - Team work	A competent work team executes our digital transformation strategy. 我的企業機構在數位化轉型策略進行時，由一組稱職的工作團隊執行。
15	Teamwork	Our ODT team emphasizes cooperation and a team approach to work. 我們的數位化轉型團隊注重團隊合作的工作方式。
16	Team Resilience	Our ODT team promotes and maintains a professional demeanour in stressful and difficult situations. 我的數位化轉型團隊能夠在壓力和困難的情況下，繼續保持專業風範。
17	Conflicts Management	Our ODT project leader initiates and supports strategies and programs to manage conflict resulting from organizational change. 我們的數字化轉型項目負責人會主動和運用策略性的方法，從而管理因轉型變革而引起的衝突。
18	Resources management & Financial Support	My organization has sufficient financial budget for the digital transformation project. 我的企業機構為其數字化轉型專案提供足夠的財務預算。

No.	Construct Operationalization	**Please indicate the level of agreement or disagreement to the following statements. (1-35)** *Strongly disagree (1) - Disagree (2) - Neutral (3) - Agree (4) - Strongly agree (5)* **請說明同意或不同意以下陳述的程度。(1-35)** 強烈不同意 (1) - 不同意 (2) - 中立 (3) - 同意 (4) - 強烈同意 (5)
19	Recognition & Rewarding	My organization recognizes and rewards team members based on performance. 我的企業機構是根據工作績獎勵團隊成員。
20	Human Resources Management	My organization's HRM supports programs and activities that attract talent for digital transformation. 我的企業機構人力資源管理計劃和活動的能夠積極吸引/招攬數字化轉型的人才。
21	Project management on Monitoring Strategy	My organization has strategic management performance metrics that improve digital transformation progress. 我的企業機構有平衡計分卡等流程進度監控系統，能夠對成功的數字化轉型產生了積極影響。
22	Precise and Cohesive Digital Strategy	My organization has a clear and coherent digital strategy, which is integral to its overall corporate strategy. 我的企業機構有一個清晰和連貫的數字化轉型策略，這是其整體企業策略不可或缺的一部分。
23	Knowledge sharing	My rganization creates a platform that facilitates internal and external exchange of knowledge. 我的企業機構創建了一個能夠促進內部和外部知識交流的平臺。
24	Strategy Choice	My organization is strategic in choosing the right technology for digital transformation. 我的企業機構在數位化轉型中以策略性選擇正確的技術
25	Risk and Cyber Security	My organization is able to control cyber security and data privacy, which are essential skills for effective digital transformation. 我的企業機構能夠有效地控制網路安全和數據隱私，這是在數字化轉型的基本技能。
26	Operational Compentency	Our ODT team has sufficient digital skills and experience to execute our organization's digital transformation process. 我的 ODT 團隊擁有足夠的數位技能和經驗來執行數字化轉型進程。
27	Core Competency & Competitive Advantage	My organization is able to implement relevant digital technologies for ODT, which differentiates it from competitors. 我的企業機構能夠在ODT實施相關的數字技術，這使它與競爭對手區分開來。
28	Agility Management Practice	My organization can exercise flexible measures to tackle unforeseen barriers encounters in the process its digital transformation. 我的企業機構採取靈活的措施來解決數位化轉型過程中遇到不可預見的障礙。
29	Sound Judgment and Decisiveness	Our ODT leader is able to make good judgement and decisive. 我們的數字化轉型項目負責人能夠以合理和明智的決策做出決定。
30	Attitude & Learning	Our ODT team learns from failures to achieve transformational goals. 我的 ODT 團隊從失敗中學習以實現轉型目標。
31	Descriptive information	The organization implementing the digital transformation project I refer to in this survey is considered successful. 在本次調查中提到的企業機構，本人認為在實施數位化轉型項目是成功
32	Descriptive information	My organization has increased revenues and profitability growth due to digital transformation. 由於數字化轉型，我的企業機構從而增加了收入和盈利增長。
33	Descriptive information	My organization has improved customer experience and engagement due to digital transformation. 由於數字化轉型，我的企業機構改善了客戶的體驗和參與度。
34	Descriptive information	My organization has boosted operational efficiency as a result of digital transformation. 由於數字化轉型，我的企業機構提高了運營上的效率。
35	Descriptive information	My organization invests in innovation capabilities to build new products and services through digital transformation. 我的企業機構投放資於創新能力，以通過數位化轉型構建新產品和服務。
36	Descriptive information	What additional factors considerably affect the success and failure of digital organizational transformation? 還有哪些因素會顯著影響數字化組織轉型的成功或失敗？ (Please specify): 其他（請註明）_____

No.	Construct Operationalization	**Please indicate the level of agreement or disagreement to the following statements. (1-35)** *Strongly disagree (1) - Disagree (2) - Neutral (3) - Agree (4) - Strongly agree (5)* **請說明同意或不同意以下陳述的程度。(1-35)** 強烈不同意 (1) - 不同意 (2) - 中立 (3) - 同意 (4) - 強烈同意 (5)
A	Management style	**How would you characterize your organization structure on the following scale?** (*Hierarchical …1…2…3…4…5…Distributed)* **您如何從以下規模描述您的企業機構結構？** *(階層式 …1…2…3…4…5… 分工式)*
B	Leadership compentency	**Which of the following skills or abilities are most lacking in your leader? (Select up to three)** **我認為我的企業機構領導者，最缺乏以下哪種技能或能力？（最多選擇三個）** 1) Knowing the business and being able to conceptualize how new digital technologies can impact current business processes/model 瞭解其業務並能夠概念化新的數字技術，從而影響當前的業務流程或商業模型 2) Willingness to experiment and take risks, 勇於嘗試和承擔風險 3) Ability to manage or work in distributed, digital-savvy teams in fast paced environments; flexible, 能夠靈活地在快節奏的工作環境中管理，和分配工作予數字化轉型團隊, 4) Ability to use digital technologies like social, mobile, analytics, cloud to execute one's job, 能夠有效地使用社交平台、移動工具、分析、雲端技術等來執行工作， 5) Willingness to share and be collaborative, 樂於分享和合作, 6) Talks enthusiastically about what needs to be accomplished 對需要完成的任務充滿熱情 7) Considers subordinate as having different needs, abilities, and aspirations from others 了解和體諒下屬個人的需求、能力和願景 8) Seeks differing perspectives when solving problems 會尋求不同的觀點角度解決問題 9) Displays a sense of power and confidence, 展現出強大的力量和自信， 10) Express their most important values and beliefs 表達他們最重要的價值觀和信念 11) Systematically discusses in specific terms who is responsible for achieving performance targets 有條不紊具體討論誰負責實現績效目標 12) Other (Please specify) 其他（請註明）
C	ODT performance	**To what extent do you agree that the following are most important objective(s) of your organization's digital strategy?** *(Select up to 3 – three)* **您在多大程度上同意以下目標是您的企業機構數位化轉型策略的最重要目標？** *（最多可選擇 3 個）* 1) Create value for business 為企業創造價值 2) Improve customer experiences and engagement 改善客戶體驗和參與度 3) Boost sustainable growth 促進可持續增長 4) Access to global markets 進入國際市場 5) Increase efficiency and reduce costs 提高效率並降低成本 6) Increase innovation 增加創新 7) Greater competitive advantage 增加更大的競爭優勢 8) Improve business decision making 改善業務上的決策力 9 Fundamentally transform business processes and/or business model 轉變業務流程和/或商業模式 10) Open new opportunities for complementary investments 為商業投資創造新機會 11) Others (please specify): 其他（請註明）
D	ODT barriers	**What is the biggest barrier impeding your organization from taking advantage of digital transformation?** *(Select up to 3 – three)* **企業機構數位化轉型的最大障礙是什麼？***（最多可選擇 3 個）* 1) Too many competing priorities 太多的優先事項 2) Lack of management understanding and supporting 缺乏管理層的理解和支持 3) Poor Leadership 領導力不足 4) Lack of overall strategy 缺乏總體戰略計劃 5) Short-term market pressures 短期的市場壓力影響 6) Insufficient technical skills 技術技能不足 7) Security concerns 保安安全問題 8) Lack of collaborative, sharing culture 缺乏協作、共享的文化 9) Lack of entrepreneurial spirit, willingness to take risk 缺乏創業精神，及願意承受風險 10) No strong business cases for supporting the initative沒有強而有力的商業案例 11) No incentive for employees 缺乏員工激勵計劃 12) Weak alignment of ODT strategy and organizational structure ODT策略和公司架構的一致性薄弱 13) Lack of organizational agility 企業機構缺乏敏捷性 14) Ineffective communication between management and employees 管理層與員工之間的溝通不足 15) Don't know 不知道 16) Other (Please specify) 其他（請註明）
E	Organization competency (Team collaboration)	**How is your organization implementing digital transformation initiatives?** *(Select all that apply)* **您的企業機構如何實施數字化轉型計劃？***（可選擇所有適用的項目）* 1) Top-down from a central senior leadership team 從中央高級領導團隊中自上而下 2) Use of experiments or pilots 使用實驗或試點 3) Cross functional team 跨職能團隊 4) Bottom up from business units across organization 從整個企業組織的營業單位自下而上 5) Don't know 不知道 6) Other (Please specify) 其他（請註明）

No.	Construct Operationalization	**Please indicate the level of agreement or disagreement to the following statements. (1-35)** *Strongly disagree (1) - Disagree (2) - Neutral (3) - Agree (4) - Strongly agree (5)* **請說明同意或不同意以下陳述的程度。(1-35)** 強烈不同意 (1) - 不同意 (2) - 中立 (3) - 同意 (4) - 強烈同意 (5)	
F	Size of organization	**What is your organization's total employee headcount? 您的企業機構員工總數是多少？** 1) 1 – 100 2) 101 – 500 3) 501 – 1,000 4) 1,001 – 5,000 5) 5,001 – 10,000 6) More than 10,000 (or perfer not answer)	
G	History	**How long has your organization been in business? 您的企業機構經營了多長時間？** 1) Less than one year 2) 1 – 4 years 3) 5 – 9 years 4) 10 – 50 years 5) Older than 50 years	
H	Industry	**Which best describes your organization's primary industry? 哪個最能描述您企業機構的行業？**	
		1) Professional Services 專業服務 2) Education 教育行業 3) IT and Technology 資訊技術與科技 4) Manufacturing 制造業 5) Financial Services 金融服務 6) Health Services 醫療健康服務 7) Telecommunication/Communication 電信/通信	8) Consumer Goods 消費品 9) Energy and utilities 能源和公用業務 10) Entertainment 娛樂 11) Media & Publishing 媒體與出版 12) Asset Management, Private Equity 資產管理，私募股權 13) Government/Public Sector 政府/公共部門 14) Others (Please specify) 其他（請註明）
I	Participants position	**Which of the following best describes your position? 以下哪項最能描述您的工作角色？**	
		1) Board member 董事會成員 2) CEO/CFO/President/Managing Director 首席執行官/首席財務官/總裁/董事總經理 3) General Management/Treasurer/Comptroller 總經理/司庫 4) CIO/Technology director/CHRO 首席資訊官/技術總監 首席人力資源官 5) Head of business unit/department 營業單位/部門主管	6) IT staff 資訊技術人員 7) Business/Product development staff 業務/產品開發人員 8) CMO, Sales & Marketing 首席行銷官，銷售與市場行銷 9) Other executive focused on digital strategy 其他專注於數字化戰略的執行階層 10) Others (Please specify) 其他（請註明）
J	Job history	**How long have you been working with the company?** **你在公司工作了多久？** 1) less than 1 year 2) 1 - 4 years 3) 5 - 7 years 4) 8 -10 years 5) over 10 years	
K	Gender	**What is your gender? 您的性別** 1) Male 男性　2) Female 女性	
L	Age	**What is your age? 您的年齡**	
		1) 21 or younger 2) 22 – 27 3) 28 – 35 4) 36 – 44	5) 45 – 52 6) 53 – 59 7) 60 or older 8) Prefer not to disclose
M	Location	**Where are your work location based? 您的工作地區在哪裡** 1) Mainland China, Hong Kong, Taiwan & Macao 中國大陸、香港、臺灣和澳門 2) United States of America & Canada 美國 / 加拿大 3) Southeast Asia (Singapore, Malaysia, Philippines, Thailand, Vietnam, Indonesia) 東南亞（新加坡、馬來西亞、菲律賓、泰國、越南、印尼） 4) India 印度 5) Australia 澳大利亞 6) Europe & United Kingdom 歐洲和英國 7) South America 南美洲	

Appendix 13: Group E, No. 1 participant

"Before diving into digital transformation, it's crucial for an organization to think ahead and plan for what comes after the transition. It's not just about implementing new tools or systems—it's about ensuring long-term success. You need a clear post-transformation process in place, including how you'll maintain and improve the technology, train employees to adapt to ongoing changes, and measure the success of your efforts. By preparing for the post-transformation phase early, you can avoid disruptions, sustain momentum, and fully realize the benefits of your digital transformation journey. It's all about building for the future, not just the present." (Group E, No. 1 participant)

Appendix 14: Group K, No. 1 participant

"Imagine trying to build a house without a strong foundation—it just wouldn't stand. The same goes for digital transformation. Without reliable and scalable technological infrastructure, the entire process becomes shaky. A solid infrastructure ensures systems are fast, secure, and capable of handling new demands. It allows teams to focus on their work, collaborate seamlessly, and adapt to change without technical hiccups slowing them down. By investing in the right tools, networks, and platforms upfront, organizations set the stage for a smooth, efficient transformation that empowers their workforce to thrive and deliver results without unnecessary disruptions." (Group K no. 1 participant)

Appendix 15: Group H, No. 2 participant

Digital organizational transformation (ODT) relies heavily on the competencies of the working team. With digital transformation comes change, and team members must be able to adapt to new processes, technologies, and ways of working. This transformational process often involves cross-functional teams and collaboration across different departments, so team members must have good communication skills. (Group H, no. 2 participant)

Appendix 16: Group D, No. 3 participant

"In the past, our company had a rough experience with digital transformation because we didn't have strong enough systems in place to manage risks or protect our data. Unfortunately, that led to data breaches and some pretty serious disruptions, which hurt our reputation and finances. But we learned from it. This time around, we're taking no chances. We've set up solid cybersecurity measures like real-time threat monitoring, data encryption, and training for our staff to handle today's cyber risks. It's all about making sure we stay protected and move forward confidently with our digital transformation efforts." (Group D, no. 3 Participant)

Appendix 17: Group B, No. 3 participant

"Digital transformation isn't just about getting the latest tech; it's about how we guide people through the changes. Think of it like planning a road trip—without a good plan and someone leading the way, it's easy to get lost. That's why having a strong strategy and good leaders is so important. Leaders need to show the vision, keep everyone on track, and help tackle problems along the way. A clear plan and solid leadership make sure everyone works together, feels supported, and the shift to digital happens smoothly." (Group B, no. 1 participant)

Appendix 18: Group G, No. 1 participant

"Looking back on the challenges we've faced, we've realized that digital transformation isn't just about using new technology—it's about using it the right way. Moving too quickly without a clear plan caused confusion, mismatched priorities, and skill gaps that held us back. We didn't fully appreciate how important it is to prepare our teams, communicate well, and make sure all departments are working together. Now, we understand that strong leadership, proper training, and involving everyone are key. By learning from our past mistakes, we can create a smoother and more thoughtful process, ensuring everyone is ready and on the same page for success this time." (Group G, no. 1 participant)

Appendix 19: Group A, No. 2 participant

"Data-informed decision-making empowers organizations to move beyond intuition by enabling evidence-based strategies. For instance, advanced analytics tools can segment customers, identify emerging trends, and predict future behaviors. This level of insight ensures that products, services, and marketing efforts are tailored to meet the unique needs of diverse customer groups. By doing so, businesses enhance customer satisfaction, foster loyalty, and build long-term relationships." (Group A, No. 2 participant)

Appendix 20: Group F, No. 2 participant

"Preparing for pre-transformation processes is about making sure the organization doesn't revert to old habits. It's essential to embed the changes into the culture, have a monitoring system in place, and plan for continuous improvement." (Group F, No. 2 participant)

Appendix 21: Group F, No. 3 participant & Group D, No 3 participant

"Continuous innovation is essential for sustaining digital transformation, as it enables organizations to adapt to evolving technologies, meet changing customer demands, and stay competitive. By fostering a culture of creativity, embracing emerging trends, and improving processes, businesses can drive growth, enhance efficiency, and ensure long-term success in a dynamic digital landscape." (Group F, No. 3 participant)

"Organizations can achieve sustainable growth in digital transformation by empowering and motivating employees to enhance their technological and knowledge-based skills. Providing continuous training programs, access to advanced tools, and opportunities for professional development fosters a culture of innovation and adaptability. Recognizing and rewarding employee contributions encourages engagement and alignment with digital initiatives. Leaders play a crucial role in inspiring teams by demonstrating the value of technology-driven processes and encouraging collaboration. By investing in employees' growth, organizations not only build a skilled workforce but also create a resilient foundation for navigating future challenges and driving long-term success in digital transformation." (Group D, No. 3 participant)

Appendix 22: Summary of research findings align with the research questions.

Research Question	Focus Group Interview (*n=32*)	Questionnaires Survey (*n=271*)
RQ1: What are the key success/failure factors of organizational digital transformation?	• 90.6%, emphasized the imperativeness of digital transformation (DT) in contemporary fast-paced • 71.8% of respondents saw Organizational Digital Transformation (ODT) as a guide for investments, • 65.6% highlighted customer experience as a catalyst for market penetration, • 75% of interviewees confirming that utilizing organizational data and technology enhances efficiency and decision-making agility	**Regression results** Heart (H^1) – Organizational Fundamental & People-centric (1,3,6,7,8,12) --- r=0.102, p=0.05 (p > 0.05) Head (H^2) – Strategy Formation and Execution Management (2,5,20,21,24,28) --- r = 0.113, p=0.027 (p < 0.05) Hand (H^3) – Competencies and Competitive Advantage (13,14,16,26,27) --- r = 0.254, p=0.000 (p < 0.001) Heart & Head (H4) – leadership Dynamic and Strategy implementation (11,18,22) --- r = 0.015, p=0.216 (p> 0.05) Hand & Heart (H3) - Competencies convergence and Organizational digital culture (15,29,30) --- r = 0.026, p=0.151 (p> 0.05) Head & Hand (H2) – Strategical execution & Team's Competitive advantage (10,17,25) --- r = 0.125 p=0.004 (p< 0.01) 3H integrated (H1) - The combination of Leading Effectiveness, Strategizing & Organizing Capabilities, Technical & Operation Competencies (4,9,19,23) --- r=0.196 p=0.000
	• 30 participants (93.7%) emphasized ODT's ability to meet customer service expectations • 84.3% fostering productivity. Enhanced digital culture, structure, employee engagement, flexibility, and scalability resonated with 87.5% • 100%) revealed the absence of a well-planned digital strategy at ODT's outset • 93.8% claimed adapting to ODT-induced disruption, evoking employee resistance • Internal skepticism, fears of workforce replacement, and pace slowdown were flagged 90.6% • digital budget constraints hindered ODT for 28 participants (87.5%).	

Research Question	Focus Group Interview (*n=32*)	Questionnaires Survey (*n=271*)
RQ2: What are the key challenges of organizational digital transformation?	• 100% revolves around budgetary limitations impeding digital transformation within organizations, • 93.7% underscores the pivotal role of capable digital leadership in propelling Digital Transformation Strategy (DTS) from conceptualization to execution • 84.4% postulate that emerging technology challenges could induce IT skills scarcity across various technological functions and highlight the disruptive potential of ambiguous digital strategies • 81.2% contend that a succession plan for sustained performance management following technology integration is a critical oversight	**Top 5 selected ODT failure factors:** 1. Lack of overall digital strategy 2. Poor Leadership 3. Lack of management understanding and support 4. Insufficient technical skills 5. Organization has too many competing priorities

Research Question	Focus Group Interview (*n=32*)	Questionnaires Survey (*n=271*)
RQ3: What conditions are necessary and sufficient for ODT successes and why?	• 100% recognized the importance of well-structured financial support and a vision aligned with broader business objectives for successful ODT • 93.8% emphasized the importance of a robust technology infrastructure to support digital initiatives • 100% agreed on the central role of effective leadership in digital transformation. • 93.7% emphasized leadership's responsibility in aligning culture and vision and allocating resources • 90.6% highlighted leadership's role in crafting transformation strategies, promoting a digital culture, and fostering adaptability to market dynamics • 87.5% of participants emphasized leadership's visionary role in inspiring innovation and experimentation	**Theoretical Implications** • Executive Sponsorship and Engagement in Driving Digital Transformation • Strategic Alignment and Impact of Digital Transformation • Significance of Expertise and Skills in Driving Digital Transformation • Synergistic Alignment of People, Strategy, and Technology • Adaptability of Digital Transformation Processes
	• Over 90% of participants stressed the importance of fostering a digital literacy culture within the team • 94% advocated for practical project management skills and 91% suggested the formation of a digital transformation steering committee involving senior management and cross-functional units • 78% recommended familiarity with change management principles to address resistance and stakeholder concerns • 72% emphasized the team's agility in responding to the dynamic ODT environment. • 93.7% prioritize operational efficiency, cost reduction, and revenue increase. • 90% seek new markets through unique digital models • 81.2% on talent attraction; 78.1% optimize speed, resilience, and supply chain	

Research Question	Focus Group Interview (*n=32*)	Questionnaires Survey (*n=271*)
RQ4: How to develop an effective holistic ODT management framework?	• 94% agreed promoting collaboration, innovation, and agile methodologies while emphasising change management • 91% advocated for cross-functional collaboration to enhance the digital user experience, and 90.6% suggested crafting a comprehensive digital talent strategy • 81.2% emphasized soft management skills; 71.8% stressed hard management skills • 78.1% agreed a robust data privacy and security framework important for ODT	**Managerial Implications:** • Craft a Cohesive Vision and Comprehensive Digital Strategy (H^1) • Promoting Active Employee Engagement and Empowerment (H3) • Implementing Robust Change Management Protocols (H^2) • Promoting Learning Culture and Skill Building Initiatives (H2) • Leadership Advocacy and Inclusivity (H^1) • Persistent Performance Surveillance and Assessment (H^3 & H3) • Ethnic Background and Global Challenges (H^2) • Long-term Resilience and Risk Mitigation (H1)
	• 96.8% agreed that an organization's digital culture and leadership are the core spines of ODT • 93.7% claimed that the digital transformation strategy and data analytics are the brains of ODT • 87.5% agreed that effective communication, resources management, technology, and strategy choice are important for ODT implementation • 90.6% commented that teamwork and engagement, decisiveness, agility, and learning culture • 78.1% agreed that the necessity of top management support, collaboration, and communication • 66% opined that share value, short-term wins, long-term gain, reward and recognition, career growth, and efficient coordination are the ODT's ultimate goals	**Pre – ODT** • Preparation Evaluation (H^2) and Change Management & Communication (H^1) • Assessment of Data & Infrastructure (H^2) and Workforce Proficiencies (H^3) • Optimal Resource Assignment (H4) • Risk Examination and Mitigation (H2) **Execution** • Change Strategy (H^2) and Leadership (H^1) • Dynamic Project Execution (H^3) and Implementation (H2) • Data-informed Decision Making for Customer Excellence (H2) • Progressive Iterative Improvement (H^2) **Post – ODT** • Strategic Performance Measurement (H^2) • Sustaining Digital Transformation Initiatives (H1) • Continuous Evolution (H2) and Disruptive Advancements (H1) • Adaptive Knowledge Stewardship for Collaborative (H1)