



Tomas Bata University in Zlín
Faculty of Management and Economics

Doctoral Thesis Summary

Digital Innovation in Banking: The Role of Managerial Factors and Personality Traits

**Digitální inovace v bankovníctví: role manažerských faktorů a
osobnostních charakteristik**

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Zlín, April 2025

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Published by **Tomas Bata University in Zlín** in the Edition **Doctoral Thesis**.

The publication was issued in the year 2025.

Keywords: *Digital Innovation, dynamic managerial capability, stimulus-organism-response, personality traits, banking industry, Ghanaian banks*

Klíčová Slova: *Digitální inovace, dynamické manažerské schopnosti, stimul-organismus-reakce, osobnostních charakteristik, bankovní průmysl, Ghanské banky*

The full version of the Doctoral thesis is available in the Central Library of TBU in Zlín.

The electronic version of the Doctoral Thesis may be found at www.utb.cz

ISBN 978-80-7678-342-3

ABSTRACT

Digital technologies have led businesses to reassess their operations and procedures to improve customer service and operations. This has necessitated the development of operational strategies through digital innovation (DI). While there is consensus on the impact of information systems and technology on DI, research on managerial factors and their interaction is limited. Previous literature emphasises the need to examine the direct impact of managerial cognition (MC) and managerial social capital (MSC) on organisational strategies and business performance. Previous research highlights the importance of personality traits (PT) in promoting proactive behaviours. However, there is a lack of empirical research on the impact of managerial characteristics and PT on digital innovation implementation. This study uses the stimulus-organism-response (S-O-R) model, DMC, and PT models to assess the influence of DMC on digital innovation (DI) in the banking sector and examines the moderating effects of PT.

The study employed the quantitative method and PLS-SEM to analyse data from 337 Ghanaian commercial bank managers. Results showed that managerial human capital (MHC), managerial digital orientation (MDO), and managerial cognition (MC) are significant predictors of digital banking (DB) implementation. MSC and managerial digital capability (MDC) have a positive relationship with MC, while MHC and MDO positively influence MC. MC served as a mediating variable, and openness to experience (Pop), neuroticism (PNeu) and agreeableness (Page) interact with MC to enhance DB adoption.

By implication, the findings underscore the theoretical significance of applying the DMC and PT theories in emerging economies. The study suggests that the banking industry should cultivate a culture and environment to prioritise MSC and cognitive development. Additionally, the institution must leverage MSC, MHC, MDO, and MDC to enhance managers' cognitive and information processing skills, thus facilitating successful digital transformation in banking operations, services, and processes. Furthermore, participation in specialised training programs that improve technical and cognitive flexibility will better equip them to understand and leverage digital opportunities while mitigating risks. Moreover, regulatory bodies should stimulate wide-ranging digital transformation strategies and the need to tailor digital transformation policies according to personality insights. The discussion includes limitations and potential avenues for future research.

ABSTRAKT

Digitální technologie vedly podniky k přehodnocení svých operací a postupů s cílem zlepšit služby zákazníkům a operace. To si vyžádalo rozvoj operačních strategií prostřednictvím digitálních inovací. Zatímco existuje konsenzus o dopadu informačních systémů a technologií na digitální inovace (DI), výzkum manažerských faktorů a jejich vzájemného působení je omezený. Předchozí literatura zdůrazňuje potřebu zkoumat přímý dopad manažerského poznání (MC) a manažerského sociálního kapitálu (MSC) na organizační strategie a výkonnost podniku. Předchozí výzkum zdůrazňuje důležitost osobnostních rysů (PT) při podpoře proaktivního chování. Chybí však empirický výzkum vlivu manažerských charakteristik a PT na zavádění digitálních inovací. Tato studie používá model stimul-organismus-odpověď (S-O-R), DMC a PT modely k posouzení vlivu DMC na digitální inovace (DI) v bankovním sektoru a zkoumá zmírňující účinky PT.

Studie využívala kvantitativní metodu a PLS-SEM k analýze dat od 337 manažerů ghanských komerčních bank. Výsledky ukázaly, že manažerský lidský kapitál (MHC), manažerská digitální orientace (MDO) a manažerské poznání (MC) jsou významnými prediktory implementace digitálního bankovníctví (DB). MSC a manažerské digitální schopnosti (MDC) mají pozitivní vztah s MC, zatímco MHC a MDO pozitivně ovlivňují MC. MC sloužil jako zprostředkující proměnná a otevřenost vůči zkušenostem (Pop), neuroticismus (PNeu) a příjemnost (PAge) interagují s MC, aby se zlepšilo přijetí DB.

Zjištění implicitně podtrhují teoretický význam aplikace teorií DMC a PT v rozvíjejících se ekonomikách. Studie naznačuje, že finanční instituce by měly kultivovat kulturu a prostředí, aby upřednostňovaly MSC a kognitivní rozvoj. Kromě toho musí instituce využít MSC, MHC, MDO a MDC ke zlepšení kognitivních dovedností manažerů a zpracování informací, a tím usnadnit úspěšnou digitální transformaci v bankovních operacích, službách a procesech. Účast ve specializovaných školicích programech, které zlepšují technickou a kognitivní flexibilitu, je navíc lépe vybaví k pochopení a využití digitálních příležitostí a zároveň ke zmírnění rizik. Kromě toho by regulační orgány měly stimulovat rozsáhlé strategie digitální transformace a potřebu přizpůsobit politiky digitální transformace osobním poznatkům. Diskuse zahrnuje omezení a potenciální cesty pro budoucí výzkum.

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1 INTRODUCTION

Innovation is a tactical and strategic instrument for economic advancement in emerging economies (Saatci & Ovaci, 2020; Amankwah-Amoah, Osabutey & Egbetokun, 2018). It refers to the intensity of novelty within a given context, and an organisation’s capacity to initiate new approaches, products, and concepts is crucial. Prior studies indicate that organisational lifestyle and culture are key factors supporting novel procedures, products, and ideas (Büschgens, Bausch, & Balkin, 2013). Innovation has emerged as the most vital tool for triggering business growth and enabling long-term success. From the perspective of Higgins (1995), twenty-first-century organisations’ most critical assets are their capacity for innovation, which helps firms achieve higher values and provide low-cost production processes, gaining a competitive advantage. Currently, innovation processes are influenced by digitalisation, with most being intensive since the internet’s birth and the development of new technologies (Agostini et al., 2020; Hinings, Gegenhuber & Greenwood, 2018).

Digitalisation has evolved from automating manual tasks to a powerful communication tool connecting organisations and people worldwide (Pattij, De wetering & Kusters, 2022). It has led to internet-driven business models and increased consumer expectations. Studies show a strong link between business growth and the use of digital technologies to develop creative business models. It allows businesses to add value to operations, incorporate customer requirements, manage integrated product life cycles, and improve efficiency. Moreover, it also makes firms more agile and resilient, enabling them to innovate and challenge traditional methods (Pascucci, Savelli, & Gistri, 2023; Nylén & Holmström, 2015). Due to intense market competition, digital technologies are becoming increasingly vital. The widespread effect of digital technologies on people and businesses is a cause for urgent action (Berger, Von Briel, Davidsson & Kuckertz, 2021).

The increasing use of digital technology in organisations has significantly impacted economic systems, social activities, and global competition (Amankwah-Amoah et al., 2018; Ciriello, Richter & Schwabe, 2018). Innovators worldwide leverage digital technology to enhance competitiveness and drive value creation (Furman, Coyle, Fletcher, McAuley & Marsden, 2019). This pervasive and global impact has led to a radical transformation of firms, with organisations innovating to meet customer demands and developing operational strategies to take advantage of the new working environment and differentiate themselves from competitors (Agostini, Galati & Galstaldi, 2019). Further, the COVID-19 pandemic has exposed deficiencies in traditional innovation processes and business process improvement, emphasising the importance of digital technology in ensuring organisational survival, efficiency, and competitiveness. Virtual technology, with its generative potential, has the potential to advance and transform well-known behaviours continuously. Advancements in IT consumerisation have intensified innovation capabilities, with digital technology serving as the lifeline of DI (Barrett, Davidson, Prabhu & Vargo, 2015).

DI is the integration of digital technology into traditional processes and products, enabling the development of new methods that differ from analog innovation techniques used in the Industrial Era (Henfridsson, Mathiassen & Svahn, 2014; Yoo, Boland, Lyytinen & Majchrzak, 2012). It supports business growth by creating new products, platforms, and services while altering business processes (Nambisan, Lyytinen, Majchrzak & Song, 2017). DI impacts firm performance, rendering traditional product developments less critical

(Ciriello et al., 2018; Nambisan et al., 2017). Additionally, it allows for the efficient management of previously challenging processes (Nylén & Holmstöm, 2015). Digitally innovative technologies help organisations maintain their competitive advantage and create product and service innovation opportunities. Hence, management's interest in DI is substantial due to its essential role in organisational restructuring and the potential for product and service innovation (Hellwig, Pawlowski & Schäfer, 2020; Nylén & Holmstöm, 2015).

This thesis is organised into the following distinct sections: 1) introduction, 2) literature review, 3) methodology, 4) analysis of results, 5) discussions, 6) contributions and 7) conclusions and future directions.

2 LITERATURE REVIEW: THEORETICAL APPLICATION AND HYPOTHESES

2.1 Theoretical lenses of the research

2.1.1 Dynamic Managerial Capability (DMC)

Dynamic managerial capability (DMC)¹ (Adner & Helfat, 2003) is a form of dynamic capabilities that specifically addresses behavioural theory-based challenges such as managerial decision-making, organisational learning, routines and processes, and organisational growth. Distinguishing between dynamic capabilities and DMC, the former concentrates on strategic change in general, but the latter focuses on the managerial influence underlying the strategic change (Helfat & Martin, 2015). Linking managerial capabilities to organisational behaviour in dynamic situations, the concept of DMC provides an intuitive notion of DI. From the perspective of Beck and Wiersema (2013), DMC emerge as a consequence of the interaction between a manager's intrinsic skills and prior experiences. Accordingly, a manager's strategic transformation and creativity refer to DMC (Helfat & Raubitschek, 2018). DMC consist of three antecedents: MHC, MSC, and MC (Ambrosini & Altintas, 2019; Beck & Wiersema, 2013). MHC is characterised by information, skills, and abilities acquired through formal or informal education, notably through leadership and entrepreneurial skills (Roh et al., 2022). MSC refers to a manager's connections with other actors due to shared experiences and frequent communication (Heubeck, 2023; Beck & Wiersema, 2013). MC, the final component,

¹ DMC also complements the resource-based theory by highlighting the managerial resources that contribute to competitive advantage and strategic change in organisations (Castanias & Helfat, 2001).

encompasses cognitive structures and processes that enable managers to anticipate change and understand the effects of organisational design decisions (Roh et al., 2022; Adner & Helfat, 2003). While MDC refers to the abilities, talents, and knowledge needed to manage digital technologies in creating new goods and services, MDO represents the manager's dedication to using digital technology to provide cutting-edge products, services, and solutions (Khin & Ho, 2018). These capabilities are crucial for managers' decision-making towards organisational change and strategic choices, with digital innovation being the central goal in this study. Therefore, DMC set the tone for evaluating digital banking behaviour among managers.

2.1.2 Personality Traits (PT) Theory

PT is a set of internal dispositions that remain stable and consistent across various contexts. These traits define an individual's behaviour, thoughts, and feelings (McCrae & Costa, 2003) and are crucial for predicting their conduct (Heineck & Anger, 2010). PT consists of cognitive and behavioural patterns that stabilise over time and differ across cultures. Understanding traits is connected to abilities like general intelligence, verbal, spatial, numerical, and emotional skills (Heineck & Anger, 2010) and motives like power and achievement. It also encompasses attitudes, aptitudes, values, and temperament, which influence experiences and behaviours. Personality can be fundamentally characterised by five primary characteristics, and hence, generally referred to as the Five Factor Model (FFM) as well as the Big Five. The Big Five personality - Openness to experience (Pop), conscientiousness (PCon), extraversion (PEx), agreeableness (PAge) and neuroticism (PNeu) - is widely acknowledged by personality psychologists as both essential and sufficient to characterise the overall structure of personality as it has emerged across several theoretical stances, languages, and rating sources (Costa & McCrae, 1992). Moreover, cross-cultural psychologists have effectively examined the manifestation of identical personality traits across diverse cultural contexts, and the applications of trait psychology in therapeutic, educational, and organisational settings are applicable across cultural boundaries.

2.1.3 Stimulus-Organism-Response (S-O-R)

The SOR model was developed by Mehrabian and Russell (1974) to explain how individuals modify their internal states in response to external environmental stimuli, thereby generating a behavioural intention response (Mehrabian & Russell, 1974). Relying on environmental psychology, the SOR

model suggests that stimulus causes changes within individuals' internal progressions, thereby informing their general behavioural outcomes (Mehrabian & Russell, 1974). According to the model, stimulus refers to an ambient component that arouses an individual's internal state (Song, Yao & Wen, 2021). These characteristics work as cues that enter a person's consciousness and prompt them to act (as receivers). In this study, "stimulus" refers to the characteristics of DMC that can facilitate managers' intentions to engage in DB. DMC increases managers' knowledge of digital technologies and equips them with the skills to engage and navigate digital platforms. It boosts managers' confidence and reduces their anxiety and fears towards DI. Hence, DMC could enhance managers' reaction towards implementing DI through the cognitive traits of MC. The stimuli, DMC incorporating MSC, MHC, MDC and MDO, proceed to the second stage.

2.2 Hypothesis Development

2.2.1 Dynamic managerial capability and Digital banking

MHC encompasses managers' educational backgrounds, job experiences, and interpersonal contacts, reflecting their abilities and expertise (Kor & Mesko, 2013). Helfat and Martin (2015) assert that managers can leverage this type of capital to restructure the resource base and identify and capitalise on opportunities and threats. Managers' access to resources and knowledge due to the goodwill generated from their formal and informal interactions with others is MSC (Ambrosini & Altintas, 2019; Helfat & Martin, 2015). Adner and Helfat (2003) argue that managers can gain insights from formal and informal professional networks, which can facilitate identifying new opportunities. Studies indicate that a rise in external connections among senior managers is associated with organisations' enhanced acquisition of strategic transformation resources (Helfat & Martin, 2015). MHC and MSC, taken together, help to demonstrate how well decision-makers meet the demands of the initial stage of innovative processes.

MDC comprises the manager's ability to utilise systematic tactics that leverage digital assets to generate distinctive value towards the development of new products and processes necessary to respond to shifting market conditions (Khin & Ho, 2018). According to prior studies, skilled digital leaders, capable of navigating the challenges of digital disruption, creating innovative business models that enhance value, and leveraging the advantages of digitalisation, are crucial for organisations to succeed in their digital transformation efforts (Lu et

al., 2024). Also, MDO is essential in determining the success of DB through enhancing DI, efficiency, and customer happiness. Verhoef et al. (2021) indicate that strong digitally minded managers are more likely to accept new technology to improve banking operations. Dedicated to digitalisation, managers create an innovative and always learning culture that guarantees the long-term survival of DB (Khin & Ho, 2018) and invest in cybersecurity, strengthening confidence and acceptability.

Conversely, MC comprises the cognitive processes and skills that enable managers to perceive, analyse, and respond to an organisation's internal and external environments (Heubeck & Meckl, 2022b). Managers necessitate a distinct array of transformational management competencies to effectively foster successful digital initiatives (Zang et al., 2024). These talents include the ability to devise a long-term strategy, foster a culture attuned to the digital age, manage the implementation of organisational changes, and maximise the use of data and digital technologies. Research has shown that MC improve DI (Yao, Dato' Mansor, Ghazali & Yan, 2024; Li & Fei, 2023). Based on the inference above, the following hypotheses were formulated:

H1: MHC (H1_a), MSC (H1_b), MDC (H1_c), MDO (H1_d) and MC (H1_e) positively influence DB.

2.2.2 Interrelations among DMC

Research indicates that the capacity of managers to recognise commercial opportunities is contingent upon prior knowledge gained through work experience, which is a component of MHC (Heubeck & Meckl, 2022b). A study conducted in Kosovo suggests that the cognitive processing abilities of managers who possess inclusive human capital have a significant influence on their firm's competitive capabilities (Kryeziu et al., 2023). Also, MHC accelerates the potential to perceive, capture, and reconfigure organisational resources, which are core micro-foundational viewpoints of MC. This implies that organisations can only utilise strategic competencies when they develop their cognitive dimensions, which are embedded in their MHC (Altintas & Loilier, 2023).

MC is influenced by managers' interactions within internal and external networks (Adner & Helfat, 2003). For instance, the expression of trust, solidarity, and robust connections inside networks allows managers to exchange possibilities (Mostafiz, Sambasivan & Goh, 2019b) that facilitate the favourable development and pursuit of new ideas. According to earlier research, MSC

encourage a deliberate assessment of options for business model innovation (Heubeck & Meckl, 2022a). As managers continually assess existing business models and purposefully consider redesigning, strategic changes are implemented, leading to DI.

In parallel, MDO refers to managers' inclination to embrace and prioritise digital technologies as part of their strategic vision. Odeibat (2023) emphasises that high levels of MDO foster enhanced cognitive engagement with new technological possibilities. Moreover, a culture that advances digital orientation persuades managers to constantly re-examine their cognitive representations, indicating the development of informational frameworks affiliated with switching digital settings. This indicates that MDO deepened by cognitive development undertakings can advance to heightened decision-making methods involving digital strategies.

MDC comprises the resources and competencies managers utilise to advance digital initiatives. Prior studies indicate that MDC is usually noted to be static. However, they are fundamentally dynamic in nature and noted to progress through constant reflections, proficiencies, and the social networks that managers develop (Li et al., 2017). This advancement principally propels cognitive alterations among managers, qualifying them to adjust and implement digital initiatives within firms quickly. Moreover, the capability to change to digital transformations improves overall DMC and augments MC by incorporating additional knowledge and insights from digital skills into their cognitive frameworks. Based on the inference above, the following hypotheses were set:

H2: MHC (H2_a), MSC (H2_b), MDC (H2_c) and MDO (H1_d) positively impact MC.

2.2.3 The Mediation effects of Managerial cognition

While prior studies affirm MHC's direct impact on MC and DI, MC enhances digital transformation initiatives. Therefore, this study proposed a mediating effect of MC on the link between MHC and DB. For instance, a study conducted in Vietnam suggests that expertise accumulated through education and practice improves managers' competence in handling the complications related to technical innovations in banking (Ghi et al., 2022). The study further highlights the requirements for the banking industry to develop a vigorous MHC to achieve thriving DI, where cognitive skills prove essential in translating and leveraging new digital technologies. Consequently,

the interaction between MHC and MC triggers the strategic projects that the banking industry embarks on to boost their digital projects.

MSC embodies the systems of associations that individual managers build up both inside and outside their organisations (Heubeck, 2023; Adner & Helfat, 2003). A survey by Mostafiz, Sambasivan and Goh (2019a) provides practical evidence that MC is crucial to how MSC influences knowledge accumulation, which, in turn, affects both non-financial and financial performance outcomes. The findings highlight that MC connects MSC and strategic decision-making processes, enhancing banking industries' performance. Further, MC is shaped by efficient connections (Helfat & Martin, 2015). This suggests that managers who effectively leverage their social networks are more likely to navigate challenges competently by accessing collective expertise and understanding, particularly in the context of DB, where agility and responsiveness are paramount.

The MDC–DB relationship is progressively critical in the current technology-driven economy. Significant to this affiliation is the concept of MC, which intervenes in how MDC affects the ability of DB ascendancies. From the perspective of Li et al. (2017), MDC among bank managers is dynamic rather than fixed, indicating that they advance through constant learning and social network interactions. Heubeck and Meckl (2022a) demonstrate that MDC significantly enhance a firm's innovativeness. They state that practical MC allows banking leaders to harness emerging digital trends and respond proactively. This assertion is corroborated by Zhu and Jin (2023), who explore how cognitive capabilities affect digital transformation efforts in banks and operational efficiencies. They note that leaders with strong digital capabilities are better positioned to identify and harness innovation propositions and subsequently improve service delivery and customer engagement.

The mechanism through which MC mediates the connection between MDO and DB is significant to the strategic management and digital transformation literature. It is noteworthy to mention that MDO is not exclusively about the adoption of new digital tools, but it is keenly rooted in how strategic changes are recognised and conceptualised by managers. The intervening role of MC was also emphasised in a study conducted by Zhu and Jin (2023), which examined the influence of digital transformation on banking operations. The results revealed that, during the digital transition season, functional cognitive approaches utilised by managers facilitate enhanced operational effectiveness. This implies that intentional cognitive investments

made by banks, including adopting a learning-oriented philosophy, enable them to achieve significant advantages from digital initiatives, thereby strengthening the importance of MC as an intermediary mechanism.

H3: MC is a channel through which MHC (H3_a), MSC (H3_b), MDC (H3_c) and MDO (H3_d) influence DB.

2.2.4 The moderation effects of personality traits

In the evolving realm of DB, understanding the interplay between PT and MC is crucial for improving decision-making processes and overall effectiveness. Previous studies suggest that entrepreneurs often exhibit high degrees of Pop, which enhances their potential to thrive in creative and dynamic environments, including the banking sector (Bode et al., 2019). Moreover, prior literary works demonstrate that extraverts thrive in roles requiring interaction and relationship management (Benoliel, 2021). Crucially for overcoming challenges to digital transformation, conscious managers are more likely to methodically review DB activities, perform extensive assessments and apply carefully developed plans (Heubeck & Meckl, 2022a). The agreeableness (PAge) quality consists of compassionate and charitable deeds. In the dynamic banking sector, individuals with high agreeableness may foster collaboration; however, the same characteristics might lead to problems when assertiveness is required in decision-making (Hasson Marques, Violant-Holz & Damião Da Silva, 2024; Gondlekar, 2014). Moodiness, emotional instability, and anxiety define neuroticism (PNeu). High levels of neuroticism can impair decision-making, increasing risk aversion and causing individuals to focus on potential mistakes—a tendency that may hinder DI in a banking environment (Bode et al., 2019).

MC and PT heavily influence DB results. Open-minded managers may welcome new DB technologies and ideas that improve cognitive agility and adaptability. They use MC well in operational plans due to these features. According to studies, conscientious managers use their mental skills and methodical approach to make better decisions. This organised cognition is demanded by using new DB tools and strategies (Heubeck & Meckl, 2022b). Extraversion aids networking and relationship-building but can hinder DB cognitive processing. Managers who rely too much on social connections may ignore strategic evaluations. Even though it would help managers collaborate, high agreeableness could limit the assertiveness needed for important DB decisions. Balancing this PT with great cognitive capacity would help to optimise group decision-making (Bian & Hai-feng, 2024). Moreover, severely

neurotic managers could find it challenging to remain cognitively clear, especially in high-stress environments such as banking. Their risk-averse nature can hinder the necessary adaptive strategies for a successful digital transition (Bode et al., 2019). Based on the discussion above, the following hypotheses emerged:

H4: Pop (H4_a), PCon (H4_b), PEx (H4_c), PAge (H4_d) and PNeu (H4_e) moderate the relationship between MC and DB.

3 MOTIVATION AND NEED FOR STUDY, RESEARCH GAP, RESEARCH QUESTIONS AND OBJECTIVES

3.1 Evolution of digital banking in Ghana

Ghana began its digital banking journey in the 1990s, driven by the Financial Sector Adjustment Program (FINSAP) and economic changes. This led to the introduction of automated teller machines (ATMS), electronic financial transactions, and online banking services. Pioneers like Standard Chartered, Ecobank, and Barclays implemented digital interfaces. The 2010s saw an explosive expansion of mobile money services, particularly by MTN Ghana, transforming financial services. The Bank of Ghana provided rules for fintech activities and electronic money issuers, leading to the Payment Systems and Services Act, 2019. The COVID-19 pandemic has further boosted digital banking acceptance in Ghana. The banking environment in Ghana is characterised by concerns over digital literacy, infrastructure constraints, regulatory gaps and overlaps, and institutional and managerial resistance to change (Baffour Gyau et al., 2025; Kuuyelleh et al., 2025; Yin, 2025; Oduro, 2020). Managers in Ghana, a developing country, play a crucial role in fostering creativity and innovation in digital banking. Their decisions are influenced by personality traits, cultural beliefs, education, and professional experience (Opoku-Okuampa, 2024; Crabbe et al., 2009). Understanding these psychological aspects helps identify factors affecting digital banking success and challenges, providing a comprehensive understanding of digital transformation.

3.2 Research Motivation

Digital innovation (DI) is a crucial competitive advantage globally, but its study in emerging countries remains under-researched due to their green financial, legal, and political establishments and low-level economic

development (Marcotte, 2014). Research suggests that digital technology can boost African industries and promote entrepreneurial growth. However, policy lacuna and institutional changes in Africa may limit innovation activities (Luther Osabutey & Debrah, 2012). Therefore, there might be the possibility of an upsurge or limitations concerning innovation activities due to the erratic changing and hesitant context (Marcotte, 2014). Besides, while an extensive increase in DI is visible in developed economies, emerging countries are also advancing through DI initiatives, although at a slow pace, indicating that DI is still green in developing nations as compared to developed economies.

DI is broadly acknowledged in practice and literature (Agostini et al., 2019; Khin & Ho, 2018); nonetheless, there is a paucity of comprehension regarding the managerial aspects that enable organisations to achieve DI. Prior research has concentrated on information systems and technological viewpoints (Anggraeni, Hapsari, & Muslim, 2021; Hanelt, Firk, Hildebrandt, & Kolbe, 2021), although few have examined managerial perspectives (Moh'd Anwer, 2019; Khin & Ho, 2018). The financial sector has undertaken initiatives to alter its business models, transitioning to DB by leveraging technology to enhance services and products (Wang, Umar, M., Akram, R., & Caglar, 2021; Chanias, Myers & Hess, 2019). The banking industry's DI has markedly increased since its inception. DB serves as an alternative to conventional banking, providing services through digital platforms that improve customer experience (Lim et al., 2019). It offers ease, financial savings, and access to multiple communication channels for customers (Le et al., 2023; Verhoef et al., 2021). Additionally, banks encounter diminished costs, augmented operational efficiency, heightened revenue, and improved business success (Le et al., 2023). Both banks and customers can communicate, obtain services, and execute transactions using digital platforms, thereby improving their overall business efficacy (Wewege & Thomsett, 2020). According to studies, DMC are crucial for enabling digital transformation (Heubeck, 2023; Pattij, et al., 2022), as has been found for instance in building smart cities (Guenduez, & Mergel, 2022), supply chain responsiveness (Roh, Swink & Kovach, 2022) and entrepreneurship (George, Karna & Sud, 2022). This study focuses on DB in Africa, highlighting the importance of managerial capabilities for enabling digital transformation. It emphasises the need for managers to possess the necessary skills to launch initiatives that enhance modern, liveable, and attractive banking. The study also examines the impact of MC and MSC on

organisational strategies and business performance, as these variables are often considered moderators in prior studies (Heubeck, 2023).

Despite numerous studies demonstrating the importance of DMC in demonstrating digital innovation-related behaviour (George et al., 2022; Guenduez & Mergel, 2022), it is crucial to consider the unique personalities of managers. PT are essential for understanding human behaviour, as they can impact individual-level innovation behaviour (Diller, Asen & Späth, 2020; Saatci & Ovaci, 2020). Open and extroverted managers are more inclined to practise digital leadership (Chen, Li & Song, 2023), potentially increasing their likelihood of executing digital transformation. Positive traits such as POP, PCon, and PEx are often linked to positive behaviours (Sobaih & Elshaer, 2022; Diller et al., 2020; Saatci & Ovaci, 2020), while agreeableness and neuroticism are often identified as barriers (Saatci & Ovaci, 2020). However, there is no interaction effect between DMC and PT, and no evidence of a moderation effect of PT on DMC and DB relationships. This underscores the necessity for further research on the interaction between organisational capabilities and personality traits, as empirical studies on this relationship have garnered less attention and remain mostly fragmented in academic literature.

Again, digital banking adoption has been extensively studied using various theories, including Technology Acceptance Models (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), and UTAUT2. These models have been used to analyse factors influencing internet and DB intentions and usage. Other studies have developed an integrated framework to assess the phenomenon (Ni, 2020; Moh'd answer, 2019). However, it is essential to incorporate additional theories to understand the precursors of DB. Prior research suggests that no single theory can adequately explain DI adoption due to various technological, social, economic, demographic, cultural, situational, environmental, psychological, organisational, political, legal, and contextual issues. Therefore, new theories in the context of DI and digital transformation are needed to supplement existing ones (Hinings et al., 2018; Nambisan et al., 2017). Hence, the current study integrates DMC and PT into the S-O-R model.

The research emphasises the significance of evaluating human elements in strategy and markets to understand DI comprehensively (Powell, 2017). Management is acknowledged as a leader in organisations, with its actions contingent upon discerning the strategic potential of DB, elucidating its importance, and distributing resources accordingly (Durán & Aguado, 2022; Raes, De Jong & Bruch, 2022). Current literature indicates that PT affect

behaviour, playing crucial roles in individual creativity, digital transformation, technological acceptance, and entrepreneurial conduct (Heubeck, 2023; Saatci & Ovaci, 2020). Evaluating behaviour from the individual's viewpoint is essential, as it is predominantly influenced by their decision-making processes (Rustiarini & Sunarsih, 2017). The evaluation of DI in the banking sector has been conducted from the viewpoints of end-users, employees, and managers, except for the study by Khin and Ho (2018), which examined digital orientation and digital capability as aspects of managerial competencies. Nonetheless, numerous empirical studies have not investigated their impact on DI within the banking sector.

To address these gaps, the study uses the DMC, PT, and SOR theories to investigate the significance of DMC in DB development and the moderating role of PT in these relationships.

3.3 Research questions and objectives

- **RQ1:** In what ways do the dimensions of DMC impact DB?
 - **RO1:** To assess the impact of the dimensions of DMC on DB.
-
- **RQ2:** In what ways do the dimensions of DMC influence MC?
 - **RO2:** To evaluate the impact of the dimensions of DMC on MC.
-
- **RQ3:** Does MC mediate the relationships between the other dimensions of DMC and DB?
 - **RO3:** To examine the mediation effect of MC on the relationship between the dimensions of DMC and DB.
-
- **RQ4:** Do PT moderate the dimensions of the DMC-DB relationship?
 - **RO4:** To assess the moderation effects of personality traits on the relationship between DMC and DB.
-

3.4 Conceptual framework

This study examines the direct effects of DMC on DB (H1a – H1e), the direct influence of other DMC variables on MC (H2a – H2d), the interaction effects of MC on the relationship between DMC constructs and DB (H3a – H3d), and the moderating effect of PT on the MC-DB link (H4a – H4e). The study's conceptual framework is illustrated in Figure 1, with Table 1 summarising the constructs used.

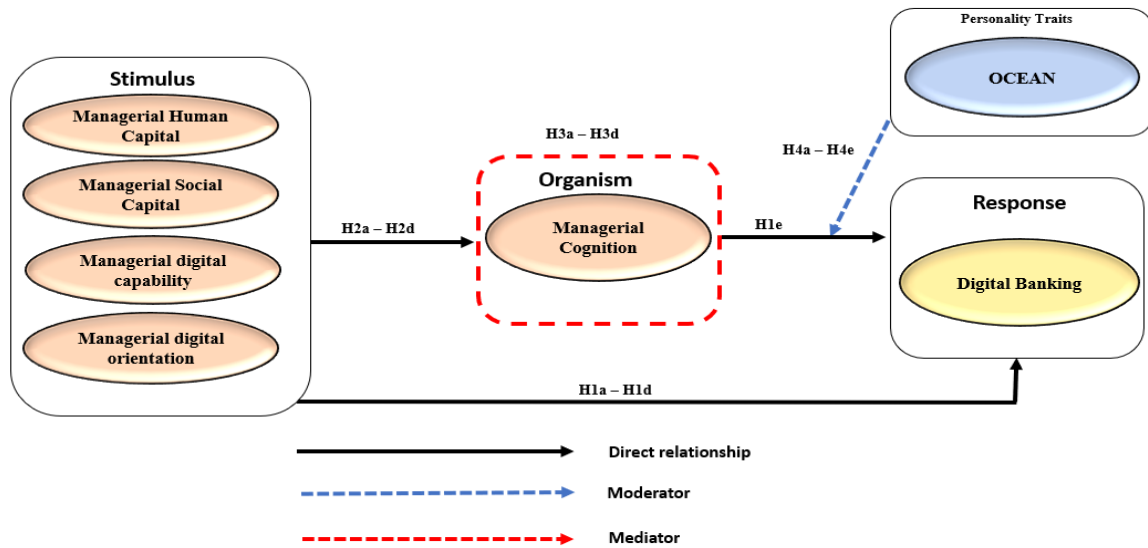


Figure 1: Proposed conceptual model (Source: author's construct, 2025)

4 METHODOLOGY

4.1 Research Approach and Design

The research approach and design guide researchers in collecting and analysing data to achieve research objectives. There are three types of research design: descriptive, explanatory, and explanatory. This study uses an exploratory design, adopting a quantitative approach.

4.2 Population, Sampling Techniques and Sample Size

Determination

The study population includes managers of commercial banks in Ghana, without considering other types of banks, such as savings and loans, microfinance institutions and rural banks. The banking sector is chosen because it represents a sector where DI and data-intensive technologies are driving significant industry-wide transformation and social effects. Sampling techniques allow researchers to moderate the data collected by collecting data from a subgroup instead of all possible cases. Prior studies highlight the importance of determining and analysing sample size in research because it is crucial for providing evidence-based results. An average of 302 samples is recommended to achieve generalisability and compatibility, utilising the three distinct sample size determination approaches - 10 times rule, power tables, G*Power program, and inverse square root method. The study used a purposive and snowball sampling technique, sampling 337 juniors to top managers.

Considering the data from the study, the banking industry in Ghana is dominated by men. The majority of respondents in Ghana’s banking industry are under 46 years old, with a majority holding a bachelor’s degree. Of the 337 participants, 83per cent had five to twenty years of working experience, indicating a relatively young workforce. Over 90per cent of the survey participants have more than a basic understanding of digitalisation, with the majority being functional managers, followed by branch and area/cluster managers. Only 18per cent are traditionally not considered managers but oversee units within banks. Lastly, 163, indicating almost 50 per cent of the participants surveyed were junior managers.

4.3 Data collection techniques

A structured, closed-ended questionnaire was developed to obtain information on the phenomenon under study. The questionnaire instrument is developed on a scale of 1 (Strongly Disagree) to 7(Strongly Agree) to collect the data for the study. The questionnaire is designed in line with the study objectives and presented to the managers of the commercial banks in Ghana. The questionnaires were administered online via Google Forms from February 2024 to December 2024. This method of data collection has been proven as an effective means in prior studies and enables the researcher to obtain a better response rate.

Table 1: Measures and concept definitions

S/N	Construct	Definition of Construct	Source
1	Managerial human capital	It encompasses information, skills, and abilities gained through formal or informal education, and notably displayed through leadership and entrepreneurial abilities.	(Roh, et al., 2022; Beck, & Wiersema, 2013; Castanias & Helfat, 2001).
2	Managerial social capital	It represents the connections that managers have with other actors as a result of having shared experiences, engaging in ongoing interactions, and communicating frequently.	(Heubeck, 2023; Beck, & Wiersema, 2013; Adler, & Kwon, 2002).
3	Managerial cognition	It comprises cognitive structures and processes that enable managers to foresee the need for change and comprehend the effects of various organisational design decisions.	(Roh et al., 2022; Adner, & Helfat, 2003).
4	Managerial digital capacity	It refers to the abilities, talents, and knowledge that managers need to oversee the use of digital technologies to create new goods and services.	(Khin, & Ho, 2018)
5	Managerial digital orientation	It represents the manager’s dedication to using digital technology to provide cutting-edge goods, services, and solutions.	(Khin, & Ho, 2018)
6	Conscientiousness	The degree to which a person values preparation,	(Zhao, & Seibert,

7	Openness to experience	possesses perseverance, and is goal-oriented. It indicates the degree to which a person is accustomed to having a wide range of interests and creativity and sees opportunities that others do not.	2006) (Furnham, 2008; Zhao, & Seibert, 2006)
8	Extraversion	The propensity for an individual to be outgoing, chatty, talkative, optimistic, and to enjoy novelty and excitement.	(Zhoa, & Seibert, 2006)
9	Agreeableness	Those who are agreeable have a strong desire to assist and work with others. They are compassionate and altruistic.	(Graziano & Tobin, 2002)
10	Neuroticism	The tendency to have frequent and excessively negative emotions in reaction to various kinds of stress is referred to as neuroticism.	(Barlow, Sauer-Zavala, Carl, Bullis, & Ellard, 2014)
11	Digital banking	Creating new financial products, procedures, or business models within and between organisations, utilising digital technology as a tool or an end in itself.	(Ciriello et al., 2018)

Source: Author's construct (2025)

4.4 Data Analysis Techniques

The PLS-SEM was utilised to examine the structural component of the measurement and the structural model (Hair, Sarstedt, Hopkins & Kuppelwieser, 2014). The research employed the model evaluation analysis procedure Hair, Hult, Ringe and Sarstedt (2017) outlined for PLS-SEM to evaluate the proposed relationships among the study's constructs. The model was assessed in two phases, as proposed by Hair et al. (2017). We first evaluated the measuring model, concentrating on the validity and reliability of the scales. Convergent and discriminant validity, in conjunction with reliability assessments, were conducted to assess the acceptability of each item. Lastly, the structural model was evaluated.

5 PRESENTATION OF RESULTS

The researcher assessed the reliability and the validity of the study utilising the composite reliability, Cronbach's alpha, average variance extracted and HTMT. Moreover, the quality of the structural model was assessed using inner variance inflation factors (VIF), coefficient of determination (R^2), predictive relevance (Q^2) and the effect size (f^2). No collinearity issues were present, since all VIF values were less than 5 (Hair et al., 2017). All R-squared values indicate sufficient explanatory power, exceeding Cohen's significance level of 0.26. Hair et al. (2017) suggest values of 0.25, 0.50, and 0.75 represent weak,

moderate, and considerable coefficients of determination. The findings indicate that DMC and PT explain about 60 per cent of the overall variations in DB. Also. MHC, MSC, MDC and MDO explain more than 50 per cent of the variations in MC. Moreover, the researcher analysed predictive statistics of performance, MC and DB using 10-fold cross-validation in PLS prediction. All Q^2 values ranged between 0.300 and 0.500, indicating the endogenous elements of the conceptual model exhibited predictive relevance. The results of the R-squared and the Q-squared are illustrated in Table 4.

5.1 Testing the reliability and validity of study constructs

Considering the composite reliability (CR) and Cronbach's alpha (CA) values greater than 0.70, it can be established that all the constructs demonstrate acceptable levels of internal consistency. Moreover, all the average variance extracted values above 0.50 indicate that the constructs achieved a good convergent validity (Hair et al., 2017). Table 2 demonstrates the results of the reliability and validity test.

Table 2: Internal consistency and convergent validity

Constructs	CA	CR	AVE
Managerial Cognition	0.950	0.957	0.691
Managerial Digital Capability	0.859	0.900	0.643
Managerial Digital Orientation	0.847	0.897	0.686
Managerial Human Capital	0.819	0.917	0.847
Managerial Social Capital	0.793	0.879	0.709
Conscientiousness	0.713	0.822	0.538
Extraversion	0.925	0.945	0.811
Neuroticism	0.747	0.841	0.570
Openness to Experience	0.747	0.808	0.587

Source: Author's construct (2025)

5.1.1 Discriminant validity

Establishing discriminant validity indicates that a construct is distinct and encompasses phenomena that are not reflected by other constructs within the model. Studies suggest HTMT is the most suitable metric for assessing discriminant validity (Henseler, Ringle & Sarstedt, 2015). Hence, it is used in this study. The result of the HTMT criterion is illustrated in Table 3. HTMT Value < 0.90 = acceptable, value > 0.90 = insufficient discriminant value (Hair et al., 2017; Henseler et al., 2015).

Table 3: HTMMT Criterion

	MHC	PNeu	MSC	MDC	MDO	MC	PoP	PCon	PEx	PAge
PNeu	0.820									
MSC	0.862	0.812								
MDC	0.869	0.896	0.712							
MDO	0.808	0.626	0.744	0.814						
MC	0.699	0.590	0.768	0.664	0.637					
PoP	0.706	0.051	0.135	0.845	0.854	0.702				
PCon	0.052	0.105	0.898	0.093	0.878	0.880	0.406			
PEx	0.112	0.123	0.107	0.074	0.086	0.065	0.136	0.107		
PAge	0.047	0.090	0.105	0.041	0.085	0.042	0.079	0.054	0.031	
DB	0.694	0.790	0.637	0.650	0.691	0.618	0.700	0.830	0.024	0.098

Note: MHC – managerial human capital, MSC – managerial social capital, MDC – managerial digital capability, MDO – managerial digital orientation, MC – managerial cognition, DB – digital banking, PNeu – neuroticism, PAge – agreeableness, PEx – extraversion, PCon – conscientiousness, Pop – openness to experience

Source: Author's construct (2025)

5.2 Hypothesis Testing

5.2.1 Assessment of direct effects

The study examines the direct impact of antecedents (MHC, MSC, MC, MDO, and MDC) and the predictor variable (digital banking) mediated by the mediator (MC). Nine hypotheses were formulated based on research objectives one and two. Five relationships were statistically significant, with MHC ($\beta = 0.189$; $p < 0.05$), MDO ($\beta = 0.210$; $p < 0.05$), and MC ($\beta = 0.235$; $p < 0.05$), all substantially impacting DB. The affiliation between MSC \rightarrow MC ($\beta = 0.407$; $p < 0.05$) and MDC \rightarrow MC ($\beta = 0.407$; $p < 0.05$) were also statistically significant. However, four direct influences were rejected. The results are illustrated in Table 4. The study's findings highlight the importance of understanding the relationship between antecedents and predictor variables in DB.

5.2.2 Assessment of mediation effects

Additionally, the analysis indicated that MC serves as a significant mediator in the relationships between MSC and DB, as well as between MDC and DB. Hence, the indirect hypotheses H3_b and H3_c were accepted. However, MC did not act as an intermediary variable in the affiliation between MHC and MC, and between MDC and MC. Therefore, the hypotheses H3_a and H3_d were rejected (see Table 5).

Table 4: Direct impacts

Hyp	Path	β	CI	T stats	P value	F square	Support
H1 _a	MHC -> DB	0.189	[0.039, 0.341]	2.456	0.014***	0.03***	Yes
H1 _b	MSC -> DB	0.053	[-0.072, 0.180]	0.836	0.403	0.00	No
H1 _c	MDC -> DB	0.105	[-0.044, 0.270]	1.301	0.193	0.01	No
H1 _d	MDO -> DB	0.269	[0.121, 0.394]	3.890	0.000	0.07***	Yes
H1 _e	MC -> DB	0.235	[0.122, 0.347]	4.107	0.000	0.06***	Yes
H2 _a	MHC -> MC	0.112	[-0.056, 0.274]	1.327	0.185	0.01	No
H2 _b	MSC -> MC	0.407	[0.268, 0.558]	5.464	0.000*	0.17**	Yes
H2 _c	MDC -> MC	0.210	[0.066, 0.350]	2.869	0.004**	0.04***	Yes
H2 _d	MDO -> MC	0.104	[-0.026, 0.230]	1.612	0.107	0.01	No
Endogenous variable			R squared	Predictive relevance Q² =			
Managerial cognition			0.528	0.376			
Digital banking			0.594	0.467			

Note: MHC – managerial human capital, MSC – managerial social capital, MDC – managerial digital capability, MDO – managerial digital orientation, MC – managerial cognition, DB – digital banking; β = beta coefficient; CI = 95 per cent bias-corrected confidence interval based on percentile bootstrapping ($n = 5,000$; one-tailed test); * $p < 0.001$, ** $p < 0.01$, *** $p < 0.0$, $f_2 < 0.02$ – no impact, $f_2 > 0.02 < 0.15$ – small impact, $f_2 > 0.15 < 0.35$ – moderate impact, $f_2 > 0.35$ – high impact

Source: Author’s construct (2025)

Table 5: Indirect relationship report

Hyp.	Path	Indirect impact (a*b)	Total impact (a*b) + c'	VAF	Support
H3a	MHC->MC->DB	0.026	0.215	12.22	No
H3b	MSC->MC -> DB	0.096	0.149	64.34	Yes
H3c	MDC->MC -> DB	0.049	0.154	31.97	Yes
H3d	MDO->MC -> DB	0.024	0.293	8.33	No

Note: MHC – managerial human capital, MSC – managerial social capital, MDC – managerial digital capability, MDO – managerial digital orientation, MC – managerial cognition, DB – digital banking, IV – independent variable, M – mediator; D – dependent variable; a = beta of IV on M; b = beta of M on D, c' – beta of IV on D; VAF – variance accounted for = $[(a*b)/(a*b) + c']$; VAF < 20 per cent = no mediation, VAF > 20<80 = partial mediation, VAF > 80 = full mediation

Source: Author’s construct (2025)

5.2.3 Assessment of moderation effects

Table 6 shows that openness to experience, agreeableness, and neuroticism are moderators of the MC-DB relationship. The interaction effect of PoP and MC has a significant positive impact on DB, while PAge and MC have a positive influence. The interaction effect between PNeu and MC negatively impact DB. The links between PoP*MC, PAge*MC, and PNeu*MC support H4a, H4d, and H4e. PCon*MC and PEx*MC have an insignificant positive and negative correlation, indicating that H4a, H4d, and H4e are supported, while H4b and H4c are not.

Table 6: Moderation analysis report

Hypothesis	Path	Beta	T Stat	P value	F ²	Support
H4a	PoP*MC -> DB	0.189	3.114	0.002*	0.034	Yes
H4b	PCon*MC -> DB	0.109	1.065	0.287	0.007	No
H4c	PEx*MC -> DB	-0.021	0.528	0.597	0.001	No
H4d	PAge*MC -> DB	0.083	2.059	0.040**	0.017	Yes
H4e	PNeu*MC -> DB	-0.188	2.308	0.021**	0.018	Yes

Note: MC – managerial cognition, DB – digital banking, *PNue* – neuroticism, *PAge* – agreeableness, *PEx* – extraversion, *PCon* – conscientiousness, *Pop* – openness to experience, β = beta coefficient; * $p < 0.001$, ** $p < 0.01$, $f^2 < 0.02$ – no impact, $f^2 > 0.02 < 0.15$ – small impact, $f^2 > 0.15 < 0.35$ – moderate impact, $f^2 > 0.35$ – high impact

Source: Author's construct (2025)

6 DISCUSSION OF FINDINGS

6.1 Dimensions of Managerial Capability and Digital Banking

According to H1a, the study reveals a positive and significant relationship between MHC and DB ($\beta = 0.189$, $t \text{ stats} = 2.456$, $p = 0.014$). A one-unit increase in MHC characteristics leads to a 19 per cent increase in DB. This is supported by previous studies that show a manager's prior experience provides a foundation for acquiring new knowledge, enhancing expertise, and cultivating personal abilities (Heubeck & Meckl, 2022b). Also, MHC can help managers in the restructuring resources, recognising opportunities and risks, and engaging in digital banking (Helfat & Martin, 2015). By implication, a manager's prior experiences and skills, including education, leadership, industrial, personal, entrepreneurial, and formal and informal training, are essential for the success of DB implementation (Heubeck, 2023; Polyanin et al., 2019). However, the results contradict previous studies that found MHC does not enhance digital innovation (Heubeck & Meckl, 2022b). Hence, the H1_a is supported.

The study reveals that MSC positively impacts DB ($\beta = 0.053$, $t \text{ stats} = 0.836$, $p = 0.403$), with a 5.3 per cent increase expected when a unit enhances it. This result suggests that effective networks among managers enable access to crucial resources like cash, talent, and strategic relationships, which directly impact growth and operational efficiency within their organisations. Moreover, a firm's digital transformation success relies on external knowledge acquisition and assimilation, highlighting the importance of knowledge transfer between individuals, groups, and organisations for effective outcomes (Heubeck & Meckl, 2022b). However, the study suggests that MSC does not significantly influence DB, supporting the study of Heubeck and Meckl (2022b), who found that MSC insignificantly impact DI, contradicting previous research. Moreover,

the result of this study is in line with the study of Malik, Andargoli, Clavijo, & Mikalef (2024), which suggests that MSC indirectly influence digital transformation initiatives. This result also corroborates the findings of Heubeck (2023), who found that MSC interacts with MHC to promote digital business model transformation, indicating that the H1b hypothesis is unsupported.

Further, this study suggests a positive correlation between MDC and DB ($\beta = 0.105$, $t\ stats = 1.301$, $p = 0.193$). The positive correlation supports empirical studies, highlighting that digital capability enables companies to respond effectively to technological advancements in digital technology and ICT (Joesoep & Daihani, 2023; Khin & Ho, 2018). However, the relationship is statistically insignificant, with a path coefficient predicting an increase in digital banking engagement by 10.5 per cent. Hence, this study contradicts a previous study suggesting that MDC significantly impacts DI (Khin & Ho, 2018; Del Giudice & Della Peruta, 2016). Although the positive correlation supports the importance of MDC in implementing DI, the correlation may be due to statistical randomness, indicating that the proposed association between MDC and DB is not supported.

Moreover, the study found a positive correlation between MDO and managers' intention to engage in DB in Ghana ($\beta = 0.269$, $t\ stats = 3.890$, $p = 0.193$). The path coefficient suggests that a one-unit increase in MDO characteristics was associated with a 27 per cent increase in DB implementation. This implies that managers' dedication to using digital technologies and their proficiency in designing these solutions significantly improve their digital banking solutions. As organisations rapidly adopt new technologies and seek opportunities to utilise DI, their interest in providing digital banking services grows (Khin & Ho, 2018). The results corroborate the assertion that digital orientation is a strategic decision for organisations to adapt to the evolution of the digital economy and the pervasive adoption of technologies (Tian & Cheng, 2022; Loebbecke & Picot, 2015). Therefore, this study supports the notion that MDO impacts innovation output.

Similarly, the study reveals a significant correlation between MC and DB ($\beta = 0.235$, $t\ stats = 4.110$, $p = 0.000$). The path coefficient value of 0.235 indicates that a one-unit increase in MC characteristics leads to a 24per cent increase in the adoption and implementation of digital banking solutions. In line with prior studies, strong cognitive skills enable managers to translate their knowledge and experience into practical digital projects (Heubeck & Meckl, 2022b; Helfat & Peteraf, 2015). The study also highlights the importance of

cultivating cognitive abilities within banks to maintain innovation and competitiveness in the digital space. Moreover, MC influences firms' strategic changes, adaptability to dynamic environments, and the effectiveness of digital strategy across multiple dimensions (Cao, Feng, Chen & Zhou, 2020). High MC capabilities enable effective risk management, informed decision-making, and the recognition of new opportunities (He, Liu & Huang, 2016). Moreover, the upper echelons theory suggests that a manager's cognitive capabilities significantly impact an organisation's behaviour.

6.2 Relationships among the dimensions of dynamic capability

The relationship between MHC and MC is crucial for organisational performance and capabilities. The beta coefficient of 0.112 suggests a positive relationship between MHC and MC, with an improvement in MHC resulting in a 11.2 per cent increase in MC. The favourable beta coefficient corroborates the study of Corrêa et al. (2018), suggesting that managers with higher levels of human capital may be more skilled in navigating digital transformation changes. However, the study's result is statistically insignificant ($\beta = 0.112$, $t\ stats = 1.327$, $p = 0.185$), suggesting that the relationship is influenced by external factors or context-dependent factors. This is in line with previous studies by Heubeck and Meckl (2022a), which emphasise the importance of utilising contextual and intervening variables. The confidence interval exemplifies the uncertainty maintained by both the p-value and T-statistic relationship, indicating the insignificant impact. Hence, the result of H2a indicates that MHC impacts MC is unsupported.

Further, research supports the notion that MSC significantly influences MC. The study found a strong, positive, statistically significant beta coefficient indicating that MSC enhances cognitive functions ($\beta = 0.407$, $t\ stats = 5.464$, $p = 0.000$). This implies that MSC enhances cognitive competencies and mental frameworks, facilitating valuable decision-making processes and innovation capabilities. The result is in line with prior studies highlighting how MSC influences managerial capabilities and cognitive reasoning (Corrêa et al., 2018; Heubeck & Meckl, 2022a). Furthermore, as indicated in prior literary works, MSC has evolved into a significant resource for managers to maintain cognitive capacity, which is necessary for interpreting and mobilising organisational resources. The results are consistent with Xu's (2011) study, which found that diversity in social capital during the start-up stage increases the complexity of an entrepreneurial cognitive model of invention. Thus, the

study concludes that MSC has a positive and significant impact on MC, supporting the hypothesis of H2b.

Again, this study reveals a significant connection between MDC and MC ($\beta = 0.210$, $t\ stats = 2.869$, $p = 0.004$). The beta coefficient (0.210) indicates that managers' cognitive abilities and frameworks were expected to increase by 21 per cent when factors underlying MDC were improved. The study's findings corroborate previous research, suggesting that MDC may catalyse cognitive development, suggesting a comprehensive approach encompassing both cognitive growth and digital training (Wu et al., 2024). The findings also support theories suggesting that enhanced cognitive abilities through MDO impact strategic choices, decision-making, and strategic planning (Li et al., 2017). The study's findings underscore the importance of developing enhanced cognitive skills by effectively integrating digital technologies, addressing the need for managerial cognition renewal during the digital transformation. Therefore, the H2c is supported.

Similarly, the study highlights the importance of leveraging MDO to enhance cognitive frameworks for assessing, interpreting, and mobilising resources in the digital environment. However, the study's statistical outlook, including a T-statistic of 1.612 and a p-value of 0.107, suggests a statistically insignificant relationship between MDO and MC. The beta coefficient of 0.104 implies that a one-unit increase in characteristics associated with MDO will lead to a 14 per cent increase in developing strong cognitive and information processing, assuming all other factors remain constant. This corroborates a prior study by Li et al. (2017), which highlights the ambiguity surrounding the direct impact of MDO on MC, emphasising the role of contextual factors in determining managerial digital initiative outcomes. Hence, the H2d indicates that MHC impacts MC is unsupported.

6.3 Testing the Mediating effect of managerial cognition

The study hypothesises that MC mediates the association between MHC and DB, with MC playing a role in the impact of MHC on digital banking. The results support the literature in India, demonstrating that a manager's cognitive capabilities significantly influence their ability to recognise and adapt to external changes, thereby advancing digital banking capabilities (Jammulamadaka, 2020). However, the VAF value of 12.22 per cent indicates that MC does not mediate the connection between MHC and DB, suggesting that a manager with elevated entrepreneurial and leadership skills experiences

cognitive enhancement, but this does not lead to increased utilisation of digital technologies for banking solutions. Therefore, the hypothesis H3a, which posits that MC mediates the association between MHC and DB, is not substantiated.

Moreover, the development of MC is significantly influenced by MSC (Heubeck, 2023). Thus, a strong MSC enhances managers' ability to acquire information efficiently, collaborate effectively, and utilise collective expertise. This interconnection enables them to anticipate difficulties, respond to environmental changes, and enhance decision-making capabilities. The study highlights the importance of MSC in improving managers' cognitive abilities to promote DB, making MC a valuable mediating variable. The VAF of 64.34 suggests that MSC and MC account for a substantial proportion of the variability in DB adoption. The result supports a prior study that posits MSC promote systematic evaluation of alternatives for business model innovation, resulting in strategic changes that foster DB (Heubeck & Meckl, 2022b). Furthermore, a study in Türkiye found that strong social connections enhance managers' cognitive frameworks, enabling them to lead successful digital transformation initiatives (Bağış, Altınay, & Saygılı, 2024). The study concludes that MC partially mediates the MSC-DB link to substantiate that H3b is supported.

Also, prior studies highlight the impact of MDC on MC (Wu et al., 2024), MC on DB (Heubeck & Meckl, 2022b) and MDC on DB (Khin & Ho, 2018). Hence, this study hypothesises that MC mediates the relationship between MDC and DB (H3c). The study reveals that MDC, through MC, significantly influences DB, with a beta coefficient of 0.154. The combined impact of MDC and MC on DB project execution is enhanced when MC mediation is included. Further, the VAF value of 31.97per cent suggests that MC acts as a partial mediator in the MDC and DB relationship, indicating that as MDC advances among managers, their cognitive and information-processing skills are enhanced, facilitating well-informed decision-making geared toward implementing DB projects. This supports the hypothesis H3c, which asserts that MC mediates the relationship between MDC and DB initiatives among banking industry managers. The findings are consistent with earlier studies that highlighted the role of MC towards improving organisational strategy and strategic planning (Helfat & Peteraf, 2015).

Further, while prior studies found that MDO significantly impacts MC (Wu et al., 2024), others support the impact of MC on DB (Heubeck & Meckl, 2022b; Helfat & Peteraf, 2015). Therefore, the study proposed that MC is a

mediator in the MDO-DB link (H3d). The direct effect of MDO on DB produced a beta coefficient of 0.269, suggesting that positive DB outcomes are associated with a higher level of MDO, underscoring the crucial role MDO plays in shaping effective decision-making and strategic choices in the digital realm (Zhu & Jin, 2023). However, the indirect effect of MC on the relationship between MDO and DB is insignificant. The VAF of 8.33 per cent indicates that MDO and MC are responsible for an insignificant percentage of the variability in the adoption of DB. The study suggests that the tendency of managers to adopt and prioritise digital technologies within their strategic framework enhances their cognitive framework but does not lead to increased utilisation of digital technologies for banking solutions.

6.4 Testing the Moderating effect of personality traits

This research explores the moderating effect of POp on the relationship between managers' cognitive abilities and psychological characteristics, particularly in the competitive banking industry, to foster innovation. Openness enhances cognitive flexibility, intellectual curiosity, and diversification, leading to strong cognitive skills that foster DB adoption (Saatci & Ovaci, 2020). Accordingly, proactiveness and POp are key traits for the successful implementation of DB (Kapogiannis, Fernando & Alkhard, 2021). The study found a significant moderating effect of POp on the link between MC and DB. This suggests that managers with high cognitive capabilities and the ability to accept new technological innovations are more likely to influence their employees to adopt DB products and innovations (Duan & Deng, 2025), improving the institution's performance. Moreover, effective cognitive frameworks are essential for integrating new technology innovations into banking processes (Shaikh & Karjaluo, 2016). The findings support the interaction effect of Pop*MC significantly impacting DB implementation among managers in banks.

Further, PCon, a key factor in managerial cognitive abilities, positively influences the link between MC and DB outcomes ($\beta = 0.109$, $t\ stats = 1.065$, $p = 0.287$). The study indicates that a one-unit increase in MC*PCon features is anticipated to yield a 10.9per cent rise in bank managers' adoption of DB. However, the small effect size suggests that PCon may affect the association between MC and DB. PCon is associated with proactive behaviour, devotedness, and a focus on completing tasks. Jang, Bottom and Elfenbein's (2025) study found that managers' conscientiousness had a higher impact on

claims performance. These findings guide the development of policies for deploying digital banking products, considering the significant role of conscientiousness. Saha and Sharma (2019) and others' findings highlight the moderating effect of PCon on the relationship between MC and DB. However, the hypothesis H4b, suggesting that the interaction effect of PCon*MC significantly influences DB among managers, is not substantiated.

Moreover, the study explores the role of PEx in managing DB in the banking sector. The result revealed that extraversion had an inverse moderating effect on the relationship between MC and DB ($\beta = -0.021$, $t\ stats = 0.528$, $p = 0.597$) indicating that high PEx may lead to decreased DI and lower banking performance. The study contradicts previous research suggesting that extroverted managers tend to be outgoing and talkative and may express doubt or confusion about perceived crime (Bjørkelo, Einarsen & Matthiesen, 2010). They also have a positive attitude towards transferring digital capabilities to employees. The inverse relationship with PEx suggests that excessive social connections may lead to cognitive rigidity, complicating the co-management of technical and legal issues in DB (Malik & Singh, 2022). The study's findings do not support hypothesis H4c, which suggests that the interaction effect of PEx*MC significantly affects decision-making among managers.

Similarly, the study reveals that agreeable managers are amiable, helpful, and focused on teamwork, facilitating the acquisition of social resources in the workplace. The study finds that a one-unit increase in MC*PAge characteristics is expected to result in an 8.3per cent increase in bank managers' adoption of DB. The combined impact of MC and PAge on DB is guaranteed to be statistically significant ($\beta = 0.083$, $t\ stats = 2.059$, $p = 0.040$). The results suggest that managers can achieve high DI with the moderating influence of agreeableness on their cognitive capabilities. Also, agreeable managers may be more adept at integrating technology-driven strategies with customer-centred approaches, traversing the complexity of DB technologies with greater openness and flexibility (Li & Fei, 2023; Babar & Tahir, 2020). In conclusion, the study's results corroborate hypothesis H4d, which asserts that the interaction effect of PAge*MC significantly influences DB among managers.

Lastly, the study examined the moderating effect of PNeu on the relationship between MC and DB in the Ghanaian sector. The results showed an adverse moderating effect of neuroticism, indicating that high levels of PNeu combined with MC strategies may lead to low performance in DB deployment, resulting in poor banking efficiency ($\beta = -0.188$, $t\ stats = 2.308$, $p =$

0.021). The T-statistic exceeded the threshold value of 1.96, registering at 2.308. This renders neuroticism a moderating factor in the MC and DB connection. This implies that PNeu in banking managers can hinder innovation due to emotional instability and anxieties. These factors can influence decision-making, making it difficult for them to adopt creative ideas or embrace the risks associated with digital banking, as per Gladstone, Matz, and Lemaire’s (2019) work. The study supports hypothesis H4e, indicating that the interaction impact of PNeu*MC significantly influences decision-making among managers.

6.5 Important-Performance Matrix Assessment

The Importance-Performance Matrix Analysis (IPMA) enhances the conventional reporting of path coefficient estimates in PLS-SEM by incorporating an additional dimension that evaluates the average values of latent variable scores. IPMA was conducted as it facilitates the prioritisation of constructs to enhance a certain target construct, hence finding the most critical regions for targeted interventions. The results are demonstrated in Table 6 and Figure 2. From Figure 2a, the study reveals a moderate positive relationship between MDO and DB, with a one-unit increase in MDO resulting in a 29.3 per cent enhancement in DB. A significant relationship exists between MHC and DB, with MHC exhibiting the highest total influence on DB. Subsequently, MC demonstrated a total effect of 0.234 on digital banking, comparable in magnitude to MHC’s. Robust managerial cognition is crucial for enhancing digital banking.

Table 6: Results of IPMA

Constructs	Managerial capability		Digital banking	
	Total effect	Performance	Total effect	Performance
MHC	0.106	74.614	0.215	74.614
MSC	0.416	69.823	0.147	69.823
MDC	0.213	73.957	0.158	73.957
MDO	0.101	75.593	0.293	75.593
MC			0.234	71.748

Note: MHC – managerial human capital, MSC – managerial social capital, MDC – managerial digital capability, MDO – managerial digital orientation, MC – managerial cognition

Source: author’s construct (2025)

Moreover, MDC and MSC are crucial for enhancing DB in developing countries. The study suggests the banking industry should prioritise developing the capacity of managers to consciously evaluate alternatives and share

information as they prepare individuals for managerial roles. Moreover, the study shows a moderate positive correlation between MSC and MC and a fair impact of MDC on MC. This suggests that regular interactions and communication with others enhance MC by 42 per cent, and a one-unit increase in abilities and skills shapes MC towards organisational change by 21.30 per cent. The banking industry should consider enhancing MHC to develop management mental structures. MDO, a commitment to innovative products and services, improves MC by 10 per cent, but has the lowest importance score. To improve managerial cognition, organisations should focus on achieving positive outcomes and enhancing their ability to focus on achieving positive outcomes.

7 CONTRIBUTIONS OF THE STUDY

7.1 Theoretical Implications

This study makes various theoretical contributions in response to the research issue. First, the study uses the S-O-R framework to explore how DMC facilitates DB. The S-O-R framework explains how individuals respond to stimuli, influencing their internal states and resulting in a behavioural intention response (Mehrabian & Russell, 1974), a concept not yet explored in managerial capabilities and DB. Focusing on the complex nature of DI processes, prior studies have advocated for new theories that can adequately explain the phenomenon (Hinings et al., 2018; Nambisan et al., 2017). Also, research on the direct effects of the subcomponents of DMC on organisational strategies and business performance (Heubeck, 2023, Durán & Aguado, 2022; Helfat & Martin, 2015) as well as their interaction effects with PT remains scant. Drawing on the SOR framework and DMC, the study investigates the direct impacts of the subcomponents of DMC (MC, MHC, MSC, MDC, and MDO) on organisational strategy (DB). The findings are crucial for developing an adequate DI infrastructure that stimulates internal cognition and emotions, increasing the likelihood of DB. Further, the study expands the SOR model and DMC by incorporating PT. Current theories utilised in assessing DI in the banking industry do not consider the interaction effects of MC and PT (Anggraeni, et al., 2021). The study highlights the importance of PT in organisational change, particularly in dynamic environments. It reveals that Pop, PAge, and PNeu moderate the MC-DB link. Hence, the study is unique in combining cognitive and psychological perspectives to explain managers' DI initiatives. Similarly, the banking industry must understand DMC and DI to

enhance customer satisfaction and promote a cashless economy. Research on DMC in developing economies is limited (Heubeck, 2023; Heubeck & Meckl, 2022a), and incorporating personality into banking can inspire new research. In the same vein, the study highlights the role of MC in enhancing DI in the banking sector. It emphasises the complexity of DI (Corrêa, Bueno, Kato, & Silva, 2018) and the role of MC in shaping online banking environments. A better understanding of MC can help banks develop effective strategies and execute digital initiatives (Karaca & Bağış, 2024), demonstrating its influence on MSC and MDC.

7.2 Managerial Implications

The thesis results provide managerial insights into advancing and implementing the digital banking agenda. First, the study creates awareness regarding the managerial factors that shape DI behaviour toward firm strategy. Also, considering the impact of personality traits, the banking industry needs to focus on inherent personal attributes in selecting its management. Further, results emphasise the need for banks to provide an appropriate environment that nurtures the traits of personnel to reinforce positive behaviours. Again, developing training programs and networking skills to bridge gaps in knowledge sharing and promotion of collaboration, which are necessary for developing digital strategies (Siswanti, Riyadh & Prowanta, 2024; Babar & Tahir, 2020), should be the focus of organisations. Similarly, the study highlights the need for banks to implement programs to build managers' emotional intelligence and cognitive resilience to reduce the harmful effects of excessive neuroticism (Bode et al., 2019; Barlow et al., 2014). Lastly, it draws attention to the need for the banking industry to focus on developing training courses that enhance cognitive skills, psychological safety, creativity and open minds (Heubeck & Meckl, 2022a; Helfat & Martin, 2015).

7.3 Policy Implications

The study shows that MHC, MSC, MDC, MDO, and MC are important, and that MC plays a key role, along with its interaction with PT, in improving DB, leading to these policy recommendations. First, the banking industry must not only emphasise traditional qualifications and experience when selecting, recruiting, or promoting managers but also incorporate cognitive and personality assessments into managerial selection processes (Judge & Zapata, 2015). Moreover, regulatory bodies should stimulate wide-ranging digital

transformation strategies (Westerman, Bonnet & McAfee, 2014) and the need to tailor digital transformation policies according to personality insights. Likewise, incorporating compulsory cognitive training into continuous professional development programs and establishing leadership pipelines grounded in cognitive and digital preparedness.

8 CONCLUSIONS, LIMITATIONS, AND FUTURE DIRECTIONS

8.1 Conclusion of the Study

The study aims to investigate the DB behaviour of managers and the relationship between their DMC and their approach to DB. It further explored the moderating role of PT in this association. The study integrated the DMC and PT theories into the S-O-R model. A total of eighteen (18) hypotheses emerged from this study. The quantitative approach, along with the causal-effect research design, was adopted in the study, and the PLS-SEM was employed to analyse the hypothesised relationships. Ten of the 18 hypotheses set for the study objectives achieved a significant impact. The study concludes that MHC, MDO, and MC are the key predictors of DB. It also concludes that MDC and MSC significantly impact managers' cognitive processes and skills. However, MHC and MDO are not critical variables that enhance MC towards DB implementation. Moreover, while the study concludes that MC, including managers' ability to identify digital ventures and make strategic decisions that reflect technological inclinations, is a mechanism through which MSC and MDC influence managers' DB implementation, MC does not mediate the relationship between MDO and DB and MHC and DB. Finally, the study concludes that PT—openness to experience, agreeableness, and neuroticism—moderate the relationship between MC and managers' adoption and implementation of DB. Further, PEx and PCon do not moderate the connection between MC and DB.

8.2 Limitations and Future Directions

Despite this study's contributions to existing literature, some research gaps still require future studies. First, the study on Ghanaian banks highlights research gaps, as it only includes commercial banks and excludes rural, savings, and microfinance institutions. The results may not reflect actual disposition and

are limited to Ghana. Future evaluations should consist of a more diverse sample to strengthen the validity of the findings. Secondly, the study's quantitative design may not have provided an in-depth understanding of respondents' responses on DMC and PT. Future research should use a qualitative design, such as interviews and case studies, to explore the phenomenon. A longitudinal study could also identify key determinants of DB in banks, as PT tend to remain consistent over time. Again, the study's results highlight the need for future research to consider employees' or end-users' perspectives on DMC for DI. The study also acknowledges the potential for self-reporting bias, which could affect the reliability of the results. Future studies should implement metrics assessing DMC, PT, and DB practices to improve data triangulation. Also, the MHC, MDO, and MC dimensions of DMC significantly impact DB, confirming the importance of DMC in explaining DI. However, traditional theories cannot fully explain this complex phenomenon (Hinings et al., 2018; Nambisan et al., 2017; Svahn, Mathiassen, & Lindgren, 2017). Future studies should explore other factors contributing to DB, as digitalisation is an ongoing process, and how they can be utilised to enhance understanding. The study further highlights the complex relationship between MHC and MC (Botts, 2017). It emphasises the importance of digital skills and MSC in enhancing MC processes. Future research should explore the moderating effects of personality qualities on the relationship between MC and DB. Hence, future studies should examine other personality variables to better understand the impact of MC and DB behaviour among managers. Lastly, psychological factors and emotional regulation can enhance DMC. Evaluating the interaction between MSC, MHC, MDO, and MDC with psychological factors can provide insights into how these factors improve DMC efficiency.

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PUBLICATIONS BY PHD CANDIDATE

Published journal articles:

- Takyi, K. N., Chovancová, M., & Asamoah, C. A. (2024). The effect of social media on the enterprise learning, innovation and performance, and knowledge management, transformational leadership, and enterprise performance of manufacturing firms in Ghana. *Journal of Competitiveness*, 16(4), 196-218. <https://doi.org/10.7441/joc.2024.04.10>
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Papers under review:

- Asamoah, C. A., Klapalová, A., Nsiah, T. K., Agirre-Aramburu, I., & Matošková, J. Exploring the role of dynamic managerial capabilities and digital innovation on perceived financial performance
- Nsiah, T. K., Asamoah, C. A., & Beata, G. Navigating the digital transformation path: The role of digital leadership and technological capability through the dynamic capability model.

Conference papers published:

- Asamoah, C. A., Klapalová, A., Nsiah, T. K., & Agirre-Aramburu, I. (2024). Perception of Gen Y and Z on bank's financial performance: Exploring managerial capabilities and digital innovation. In *Proceedings of the 19th European Conference on Innovation and Entrepreneurship* (Vol. 19, No. 1, pp. 62-70)
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Personality Traits**

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osobnostních charakteristik**

Doctoral Thesis Summary

Published by: Tomas Bata University in Zlín,
nám. T. G. Masaryka 5555, 760 01 Zlín.

Edition: published electronically
1st edition

Typesetting by: Comfort Adebí Asamoah

This publication has not undergone any proofreading or editorial review.

Publication year: 2025

ISBN 978-80-7678-342-3