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PhD THESIS

Analyzing the Digital Transformation of Management: A Study on Consulting and the Development of a Digital Maturity Model for Project Management

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Summary

The advancement of digital technologies is taken place at unprecedent speed reshaping traditional business models (BMs) within all industries (Hartl and Hess 2017). The umbrella-term under which these developments occur is DT. Among various other definitions, DT is a technological achievement with disruptive potential that creates new BMs in all sectors (Gökalp and Martinez 2021; Hartl and Hess 2017).

In order to face DT, organizations have adopted different strategies. They must employ radical changes, digitalize and rethink their entire BMs, along with organizational elements such as structures, processes, and most importantly culture (Grover, Tseng, and Pu 2022). Organizational transformation towards adopting and integrating digital technologies is a prerequisite for organizations that want to keep delivering value and meet the increasing customer demands. One way to start with these changes is by adopting digitalization. Digitalization means integrating software systems that communicate and exchange solely digital data in an automated manner. In this regard human interaction is reduced and the use of digital technology that enables that application is maximized (Davidovski 2018). DT reshapes the way organizations interact with data. Data-driven DT reorients BMs towards acquiring new data and use that in new, innovative ways (Šimberová et al. 2022). The rapid proliferation of smart devices connected to the Internet is a key driver of DT and a feature of digitalization, reshaping markets by offering fast and cost-effective solutions. Additionally, digital-native professionals increasingly expect a highly digitalized work environment, as they are already familiar with various devices and applications. Together, these factors contribute to the emergence of Industry 4.0, also known as the Fourth Industrial Revolution (Ghobakhloo 2020; Lepore et al. 2020; Corso et al. 2018). Although not uniformly speeded across the globe, we live in relatively highly digitalized societies and for organizations to lag behind this evolving trend might mean becoming irrelevant (Šimberová et al. 2022).

Our research firstly focuses on management consulting (MC), a sector that has, until recently, been relatively resistant to DT due to specific structural factors. Despite being a knowledge-intensive and service-oriented industry, MC has experienced significant growth and maturity largely independent of digitalization (Deelmann 2018; Mosonyi, Empson, and Gond 2020). However, MC

is not immune to DT impact. Organizations in the management field are particularly impacted by DT, as digital technologies hold significant disruptive potential, especially in knowledge and data-driven service industries (Christensen, Dina, and Derek 2013). It is much easier to automate domains heavily reliant on data than hard industries like manufacturing or constructions (an observation backed by Yuval Noah Harari in his bestseller Nexus). As a result, management organizations must adapt quickly by leveraging digital tools, automation, and data analytics to remain competitive and drive innovation in an increasingly digital landscape.

The first scientific contribution of this thesis is identifying the mechanism through which MCCs adopt digitalization. Through a systematic literature review, we sought to find how DT is altering the MC landscape, a domain that has traditionally eluded the disruptive effects of DT thanks to some of its unique features. There is a gap between MCCs that advise clients in DT initiatives and the very DT status of the consulting industry itself. However, DT is imminent in MC (Christensen, Dina, and Derek 2013) and existing MCCs have responded to it differently, by adopting different strategies at different stages by integrating digital tools within their BMs. As a highly knowledge-intensive industry, MC faces numerous opportunities to digitalize, from the basic steps of digitization, to complex digitalization features like integrated web platforms. In order to identify the context of this gap and what digitalization strategies MCCs have adopted we have followed the following research steps:

- We have performed a systematic literature review to understand the consulting domain and how it positions itself towards DT, identifying the time periods in which this has evolved. Then we had to extract only those articles which point to an actual digitalization initiative of an MCC;
- After the aggregation of the relevant articles, we have performed a CIMO analysis to identify the context and the mechanism – if any – through which MCCs are responding to DT. Our findings from this step were important for our research, as we were able to use concepts from existing mechanisms and map them further in our empirical research.

A common agreement within the DT literature is that it needs management support throughout all implementation steps, from the decision to expansion (Heavin and Power 2018). For DT to be adopted, the management needs a digital-oriented mindset. This leads to our second contribution which resides in testing the way DT can be utilized to improve existing management tools, particularly project management (PM) tools. Building the theoretical findings regarding DT mechanisms in MC, our main research contribution resides in proposing a new approach to Project

Management Maturity Models (PMMM), that considers digital affordances and the features of platformization.

Within PM, technology has been used as a tool to assist project managers (PMs) in managing their projects but PM is not yet digitalized. PMs should investigate how technologies can be used to optimize PM techniques considering that interest in digitalization within the PM discipline is growing (C. Marnewick and Marnewick 2022). We developed a web-based maturity assessment questionnaire that makes use of digital features like dynamic rendering, reporting, recommender system, tailored results or report exporting. The model was developed to overcome existing limitations of traditional Maturity Models (MMs) by integrating digital technologies. Previous literature highlighted persistent theoretical and practical limitations of MMs, which partly led to questioning their reliability and validity in PM adoption (Mullaly 2014). Among the most cited limitations pointed to PMMMs were lack of a strong theoretical foundation, questioning practical improvements brought in organizations or lack of prescriptive elements. Our model has been built following the next steps to overcome these limitations:

- We followed a rigorous and validated design methodology (De Bruin et al. 2005) which represents and end-to-end flow of developing MMs, from defining the scope to the final testing phases of the artifact with domain experts;
- The contents of our PMMM are derived from an established body of knowledge, Project Management Handbook (PMBOK) 2021 7th edition as the main theoretical source. The handbook provides up-to-date PM practices and has enabled the development of our PMMM to be both transparent and theoretically verified. Moreover, we have integrated the recommendations from the literature to have experts involved in the development process to verify and further PMMMs items.
- The model has a recommender system that yields tailored improvement recommendations for maturity ranking from one to four. The prescriptive elements are presented in a user-friendly graphical user interface (GUI) (Pöppelbuß and Röglinger 2011a), and they have been designed not to impose budgetary or administrative burden, ensuring that maturity assessment remains practical and goal-oriented, rather than an end in itself, was a key design consideration.
- To make the PMMM more appealing, we have designed a simple, easily accessible and friendly web-based GUI for the PMMM adopting a platformization paradigm for PMMM designing and sharing.

Building a new PMMM represents only half of our research contribution to the PM domain. In order to contribute to the digital intelligence in the domain and to expand the research into the digitalization of PM (C. Marnewick and Marnewick 2022) we took into consideration the remarks of (Kwak et al. 2012) regarding the need to measure the usefulness perceptions of end-users towards the tool for their work. After PM experts have used our MM, we gathered a post-completion feedback questionnaire from 16 PMs and applied TAM and fsQCA methods to identify scenarios in which users manifest various intentions to use the tool. We applied Pappas and Woodside (2021) fsQCA implementation guidelines and revealed multiple pathways that influence users intention to use the MM: three leading to high intention and two leading to low intention.

Our research contributes to the ever-evolving field of management by addressing the literature's call for further exploration of digitalization within the management domain. The theoretical part of this thesis contributes by identifying digitalization trends and implementations within MC, a domain heavily reliant on knowledge that has eluded digitalization until recently.

The empirical part of this thesis adopted a design science approach to create an artifact, from the concept, through validation to an actual usable web application. The value added to the PM domain resides in a new PMMM that: addresses established criticism of traditional models and uses digital technologies to elevate MM as usable digital tools in PMs portfolio in the context of PM digitalization and the need for digital intelligence.

As the impact of DT on management continues to grow, the adoption of DT across organizations increasingly becomes a strategic management decision. We explored how digital tools and technologies are redefining project execution, decision-making, and organizational efficiency. It examines the shift from traditional project outcomes to digital value creation, the evolving role of Project Managers (PMs), and the growing necessity for agile leadership and talent management in an environment that is changing rapidly. By considering both strategic and operational perspectives, this section offers insights into how organizations can leverage DT to ensure long-term project success. The literature emphasizes the urgent need for updated and more adaptive theories on digital innovation management, capable of addressing the fast-evolving nature of innovation processes in the digital era (Hinings, Gegenhuber, and Greenwood 2018).

A systematic literature review by Kraus et al. (2022) on DT in business and management found that since 2018, “Industry 4.0” and “change management” have been recurrent topics in the field. Since 2019, there has been an increasing focus on dynamic capabilities in the context of DT. These capabilities are crucial not only for preparing for digital transformation but also for fully

capitalizing on the opportunities it presents. Furthermore, research underscores the importance of strategic actions in enhancing the success of a company's transformation process (Kraus et al. 2022; Fernandez-Vidal et al. 2022).

Managers must balance the exploration and exploitation of their organizations' resources to achieve organizational agility. In the context of rapid DT, integrating digital affordances (DAs) (Henningsson et al. 2021) into management practices is essential. DAs enhance agility, provide real-time insights, and improve accessibility, with the potential to transform products, services, or business models (C. Marnewick and Marnewick 2022; A. L. Marnewick and Marnewick 2020). DAs represent the possibilities for goal-oriented actions that digital artifacts enable for specific user groups. They emerge as a relational construct between an actor and digital technology, influencing how users interact with digital tools. Due to the inherent functional flexibility of digital technologies, some affordances are intentionally designed, while others emerge beyond their original purpose, fostering unforeseen innovations. DAs are always tied to the goals an actor aims to achieve, where goals reflect the desired outcomes during the affordance actualization process. Theoretically, affordances refer to potential uses, while actualization occurs when users leverage these affordances in practice. Successful actualization of DAs requires managerial attention to ensure that digital capabilities align with organizational objectives and drive meaningful transformation (Henningsson et al. 2021). These features can lead to cost reductions across the supply chain and go-to-market processes (World Economic Forum 2019). Proper data usage for informed decision-making presents a significant opportunity. Companies that are "low on the digital curve" will risk losing opportunities and market share. Management boards must adopt a digital mindset, understanding that there is no longer a separate digital economy, but rather an integrated digitalized economy in which every organization is, to some extent, a tech company. In this digital economy, management teams are responsible for understanding the full potential of their business model and ensuring it is aligned with digital innovations to maximize added value.

While significant time and resources are invested in selecting and designing projects, effective PM remains crucial for organizations to achieve their performance goals. PM has long been recognized as a key factor in the success of organizations and is now more essential than ever for ensuring efficient project execution and supporting managers in decision-making. With the development and widespread adoption of advanced PM software across various organizations: large or small, private or public, these tools play a crucial role in enhancing effectiveness (Raymond and Bergeron 2008).

In the PM literature, IT-based information systems have been recognized from the outset as essential for supporting project managers in planning, organizing, controlling, reporting, and decision-making tasks. Digital solutions, driven by Industry 4.0 algorithms, enhance project success by offering project managers critical insights and forecasts (Kanski and Pizon 2023; C. Marnewick and Marnewick 2021). Though still in its early stages, digitalization in PM is gaining steady interest (C. Marnewick and Marnewick 2022). The application of DT shifts project outcomes from traditional products or services to digital information (Whyte 2019).

Procca (2008) stresses the importance of cultural change to any PM initiative before progression through the maturity phases can begin. Projects no longer deliver a physical product or a service, but also digital information. Whyte (2019) argues that project managers must adapt to and integrate new digital technologies (DT) into their projects. Over time, consistent use of DT is expected to shift project outcomes from traditional products or services to digital information. Successful digital transformation can lead to higher sales, improved productivity, and innovative approaches to value creation and customer engagement. Kraus et al. (2022) emphasize that DT integrates technologies like machine learning and analytics, unlocking numerous opportunities for organizational solutions and enhancing internal efficiency. According to Kraus et al. (2022), research on DT in business and management is shaped by both an internal perspective, rooted in a resource-based view, and an external perspective, focused on structural change and evolving value creation. The internal perspective explores strategy, dynamic capabilities, and big data utilization as key factors in successfully navigating digital transformation. Meanwhile, the external perspective examines structural shifts and their impact across different levels.

Given the profound consequences of DT for companies, industries, and entire sectors, it is unsurprising that much of the literature focuses on alternative or emerging models of value creation. According to A. L. Marnewick and Marnewick (2020), the development framework and innovation timeframes are being considerably reduced, and an Agile perspective fits into this environment characterized by change. Traditional hierarchical leadership styles are increasingly being replaced by agile-style leadership approaches that drive positive change and innovation. In line with the literature on talent management, A. L. Marnewick and Marnewick (2020) suggest that critical factors for the Fourth Industrial Revolution in management are being heavily influenced by people. For example, one critical factor, empowerment, states: "the environment must allow employees to develop autonomy and responsibility in order to behave proactively" or collaboration and teamwork: "the digital reinvention requires business and technology

implementors to work closer than ever before. This implies trust and communication within the collaborative environment."

The disruptions brought by the Fourth Industrial Revolution should be viewed as opportunities rather than threats. This requires fostering a culture that embraces continuous change and adaptation. Organizations depend on PMs to possess the skills and expertise necessary to navigate these disruptions effectively. Beyond managing change, PMs must also have the technological proficiency to leverage emerging technologies such as artificial intelligence and machine learning. These advancements demand agility and speed from project teams, which cannot be achieved through traditional command-and-control leadership. Instead, a servant-leadership approach is essential to empower teams and drive innovation in a rapidly evolving digital landscape (A. L. Marnewick and Marnewick 2020).

Project managers must continuously update their skills in this dynamic environment, adapting alongside the organization and taking the lead in driving and implementing technology-related projects. The study of C. Marnewick and Marnewick (2021) highlights the importance of digital intelligence among employees' core skills. Digital intelligence refers to an individual's ability to effectively use knowledge to navigate and interact successfully within the digital world. It involves the skills and competencies needed to solve problems in the digital ecosystem. Since early intelligence research did not anticipate the digital era, we live in today, the concept of digital intelligence has emerged to address these new challenges (C. Marnewick and Marnewick 2021).

The managerial roles in contemporary organizations are affected by automation technology. How this will impact managerial ranks is still an open research field with some calling for the creation of dedicated digital leaders responsible with digital technologies, chief digital officers or CDOs (Van Doorn et al. 2023; Fernandez-Vidal et al. 2022). For certain, the role of managers is critical in ensuring successful digital transition in their organizations. Managers must comprehend the impact of existing and emerging digital technologies to identify potential opportunities and challenges, adjusting and coordinating the company's strategy as needed (Fernandez-Vidal et al. 2022).

To succeed in fulfilling DT companies should adapt also their talent management (Montero Guerra, Danvila-del-Valle, and Méndez-Suárez 2023). Implementing digital technologies requires talent and the right team that can work together to drive change. According to Montero Guerra, Danvila-del-Valle, and Méndez-Suárez (2023) the more DT advances in management, the more a "war for talent" will deepen. In this context organizational managers must develop sustainable

talent management strategies to ensure long-term stability and maintain competitiveness in the global economy, rather than relying on short-term approaches that may lead to economic instability and mass layoffs. Intellectual capital and talent are becoming critical to an organization's strategic success. Factors such as digitization, labor shortages, mergers and acquisitions, simultaneous downsizing and expansion, demographic shifts, and globalization have all contributed to making talent management a top priority for organizations (Kohnke 2017).

We began this review with the goal of identifying the paths taken by management consulting companies in employing digital technologies. Considering the predictions of Christensen, Dina, and Derek (2013), the implications of DT in traditional MC services have received an increasing level of attention (Deelmann 2018; Nissen and Seifert 2015). After considering the 18 cases, we can conclude that DT has changed the nature of MC. The three identified paths followed by MCCs in considering DT do not form a maturity model, but can present alternatives from which traditional MCCs and new businesses interested in entering the field can choose.

Considering the first path or mechanisms that we have identified, DT affects traditional MC, as traditional consulting services are increasingly provided through platforms. The platformization of traditional management consulting could be considered the normal path followed by traditional MCCs. Platformization makes modularization and customization of services available to more customers, improving both service delivery and service quality, as well as making it more accessible in terms of the cost because the use of platforms increases the number of customers that can be served. Technology is used by MCCs to standardize and automate MC services. Although platforms do not offer equal options and complexity, with some providing automatic reports and others still requiring intervention by consultants, the nature of consulting is affected, and consulting is no longer about building trust or prestige (Christensen et al. 2013; Glückler and Armbrüster 2003) but, rather, about providing solutions, data, and knowledge. Llewellyn (2017) spoke about the democratization of knowledge and the fact that data has become more available now than in the past. This democratization of knowledge poses a challenge for MCCs that sell knowledge to customers.

A larger number of studies view the role of consultants as knowledge managers, rather than merely knowledge providers. The value of MCCs is measured not in terms of knowledge per se but according to their ability to gather, sort, filter, and extract relevant data (Bensberg et al. 2019; Bode 2019; Larsson et al. 2020; Tavoletti et al. 2019). In this way, MC benefits are easier to track, and a consultant’s work is more tangible in comparison to the fuzzier outcomes of MCCs’ traditional

service delivery (Mattila and Tukiainen 2019). At the same time, this transformation to digital management consulting services by traditional MCCs diminishes the role of "nondigitizable professional judgment or expertise" (tacit knowledge) for which consulting business has been recognized (Zhou and Muller 2003). This transition from a human-based business model to a digital data–based BM is seen even at large MCCs, and the nature of MC and the management consultant profession is experiencing major changes related to this market major trend. This transformation and the use of digital technologies in MC is not recognized as a premium feature but, rather, as the default way of doing business (Larsson et al. 2020). In this light, the question that every MCC needs to answer to establish its DT path is: How much of the management consultants' tasks can be automated?

The other two paths/mechanisms are rather disruptive in terms of the BM followed by traditional MCCs. First, MC crowdsourcing (Christ et al. 2018; Jamous and Nader 2017; Seifert and Nissen 2018a) enables the creation of collective intel¬ligence (Christ et al. 2018) by multiple MCCs. In a way, this is totally unnatural in the management consulting field, in which services are traditionally provided in a sharply defined, long-term social relation between the provider and the customer (Glückler and Armbrüster 2003). Alternatively, this crowdsourcing mechanism can be interpreted as another facet of the democratization of knowledge because some MCCs can specialize in specific services or specific knowledge. DT and platformization enabled the creation of this path as the identification and selection of partners have been facilitated.

Second, the DT of the consultant-client matching process mechanism, increases access to more MCC providers and customers, which seems inimical to traditional MC from the perspective of the management consulting elite halo (Christensen et al. 2013). With DT, MC services are offered by many freelancers and MCCs, and highly skilled niche labor (Christensen et al. 2013) can be paid by the hour and can be involved in multiple projects as freelancers who do not need to be employees of a top MCC. By allowing newcomers and freelancers to enter the MC field, this mecha¬nism is a threat to large traditional MC companies. It erases the barriers traditionally faced by small companies in accessing this market in the past. Both crowdsourcing and the DT of the consultant-client matching process allow customers or consultants that represent their interests (MC project coordinators) to pay for portions of services, representing the transformation of management consulting in the platform or gig economy (Friedman 2014). As MC becomes more standardized, tasks can be decomposed, such that more small companies and individuals/freelancers can perform them. However, research on this aspect of the gig economy is

still emerging (Kaine and Josserand 2019), and more analysis is needed about the impact on MC as a profession and an industry.

For practitioners, the results of our paper summarize the DT of the MC industry and should help them to establish a DT path at their companies. The results of our paper confirm that the DT process has deeply transformed the world of management consulting, and this process cannot be ignored. In short, more MCCs have adopted and use digital tools to transform and provide their traditional MC services to more customers. The way of offering MC services is not the exception now but, rather, the rule. Alternatively, or complementarily, technology is used for improving the customer-client matching process. The use of platforms for finding new customers in different regions is an accessible use of technology for MCCs and should be considered an opportunity for them to extend their customer base. Finally, MCCs could consider the use of crowdsourcing platforms in finding partners that could help them to identify solutions to more complex customer problems. As the frequently cited author Christensen stated about the inevitable disruption of the consulting business (Christensen et al. 2013; Flynn and Kowalkiewicz 2017; Jerónimo et al. 2019; Llewellyn 2017), in order to remain relevant in the market and to address higher and more complex demands from clients, firms have to adopt new strategies and question their existing BM (Fuchs et al. 2019; Ho et al. 2011; Jerónimo et al. 2019). In an increasingly digitalized world, where information flows are vast and extremely rapid, the ability to process, analyze, and synthesize big data for clients will pose a challenge for consulting companies who remain behind the digital curve and an opportunity for those that invest in digitization (Corso et al. 2018; Jerónimo et al. 2019). This opportunity could not be created in the absence of a BM change or adaptation in which IT tools and specialized technology information plays an integrated part (Jerónimo et al. 2019).

This thesis offers a web-based self-assessment PMMM developed to overcome existing limitations of traditional models by integrating digital technologies. After gathering a post-completion feedback questionnaire from 16 PMs that used our MM, we applied TAM and fsQCA methods to identify scenarios in which users manifest its intention to use.

Previous literature highlighted some persistent theoretical and practical limitations of PMMMs, which partly led to questioning their reliability and validity in PM adoption (Mullaly 2014). One of the most cited such limitation pointed to PMMMs lack of a strong theoretical foundation. Our study has taken the following steps to overcome this critique: we followed a rigorous and validated design methodology (De Bruin et al. 2005); and used an established body of knowledge, PMBOK as the main theoretical source for the construction of the tool. Another limitation is concerned with

the actual practical improvements PMMMs could bring to organizations. Our study uses the latest PM practices as detailed in PMBOK 2021 7th edition. The handbook provides up-to-date PM practices and enabled our PMMM development to be both transparent and theoretically verified. Moreover, we have integrated the recommendations from the literature to have experts involved in the development process to verify and further PMMMs items. Concerning other limitation, the lack of prescriptive elements of PMMMs, this study has built improvement recommendations for maturity ranking from one to four. The prescriptive elements are presented in a user-friendly graphical user interface (GUI) (Pöppelbuß and Röglinger 2011), and they have been designed not to impose budgetary or administrative burden, having in mind the idea that maturity for the sake of maturity is undesirable. In order to make the PMMM more appealing, we have designed a simple, easily accessible and friendly web-based GUI for the PMMM adopting a DT paradigm for PMMM designing and sharing.

In addition to these developments, we took into consideration the remarks of (Kwak et al. 2012) regarding the need to measure the usefulness perceptions of end-users towards the tool for their work. We applied (Pappas and Woodside 2021) fsQCA implementation guidelines and revealed multiple pathways that influence users' intention to use the PMMM: three leading to high intention and two leading to low intention. The first three paths leading to high intention to use are characterized by the strong presence of TAM variables PEOU and PU. The custom variable Robustness of the tool also emerged as a key contributor in two paths. The results show that the strongest motivation for usage is given by the presence of both PEOU and PU particularly in non-IT and smaller organizations (Pathway 1). Although this is the first study to apply TAM and fsQCA to a PMMM, the significant contribution of PEOU or PU were also found when measuring other PM tools like ERP (Kwak et al. 2012; Vărzaru 2022) or learning management systems (Eraslan Yalcin and Kutlu 2019). Besides the core TAM variables, we have extended the measurement variables palette by introducing both static variables (maturity score, industry, and organization size) and custom variables (Perceived Robustness of the tool, Perceived Understandability). Coupling either PEOU or PU with Robustness also yields high intention to use (Pathways 2 and 3). This suggests that regardless of the industry, size, or maturity level, if PMs regard the tool easy, intuitive and reliable their intention to use it is high. At the opposite, pathways leading to low intention to use point to the core role of Perceived Understandability. When users perceive the tool's interface unstructured or requirements unclear, the intention to use drops significantly, mainly in larger organizations.

Our findings show the unique perspectives TAM and fsQCA could bring in PMMM literature. For instance, the results indicate that high intention to use is driven not by organizational factors like industry or maturity, but by individual perceptions of the tool's usability and reliability. The maturity level of an organization does not independently influence the intention to use a PMMM; an observation that implies that even organizations at lower maturity levels might be open to adopt MMs, if the tool is perceived as reliable and intuitive. These findings widen the applicability of PMMMs for small or medium organizations, since they imply no budgetary pressures or prior PM expertise.

Our work contributes both theoretically and practically to the larger PM literature by presenting an end-to-end flow of a PMMM creation, from the concept, through validation to an actual usable web application. The study might serve as a starting point for MM practitioners or researchers in developing, conceptually and practically, an end-to-end MM. Also, from a practical point of view, our findings reinforce and expend TAM by demonstrating the amplified role of user-centric variables in smaller organizations. For MM practitioners/developers, this suggests prioritizing user-friendly, intuitive designs and robust functionality to enhance adoption, particularly in less formalized environments.

In this thesis, we examined the digitalization trends impacting management. It explored the necessity of DT in service-oriented businesses focusing on consulting companies. We started by properly understanding the concept of DT, digitalization and digitization, to be able to correctly map DT initiatives of organizations. Having the theoretical framework set up, we employed a systematic literature review on real examples of DT in the domain of MC, which we considered a good candidate thanks to its knowledge-intensive characteristics. Following a selection of the most relevant articles for our research, a CIMO analysis has been performed to identify digitalization trends within this domain. We found that one of the most advanced forms of digitalization is platformization of traditional MC services - a feature enabled mostly by customer needs. Digital technologies have a disruptive potential in management (Christensen, Dina, and Derek 2013) and, as we have presented in a previous article (Crișan and Marincean 2023), the MC domain has managed to elude the structural integration of DT, hence keeping relatively traditional BMs in place. After identifying the characteristics of platformization (Crișan and Marincean 2023) and how are they applied to MC in particular, we proceeded to develop a new PMMM by employing digital affordances theory, subscribing to digitalization trend within management. Besides introducing a new PMMM, this thesis aimed to investigate the pathways influencing the intention

to use the tool, with a focus on integrating TAM and fsQCA methodologies. Specifically, it explored user perceptions and organizational factors driving adoption, a gap previously unaddressed in PMMM literature.

We examined the literature review on PMMMs and MMs in general, to find key aspects of designing and implementing MMs. Also, the literature review helped identifying existing limitations PMMMs have which haven't been addressed in the literature (Mullaly 2014; 2006). The most recurrent critiques of existing PMMMs were identified as: lack of theoretical foundation, narrow or mechanistic focus, unflexible, overly descriptive lacking prescriptive elements, forced one-size-fits-all, or reaching maturity for the sake of maturity (Brookes et al. 2014; Judgev and Thomas 2002; Mullaly 2014).

We decided to follow the design principles created by De Bruin et al. (2005) which describes a complete flow from defining the scope of the MM to the final testing phase. We have constructed our model based on PMBOK 2021. The tool has been validated in two iterations by certified PMs before being deployed into a web-based application constructed with React and Firebase. At the end of the self-assessment flow, the users were requested to fill in a post completion feedback questionnaire started from elements from Salah, Paige, and Cairns (2016) and customized TAM-specific questions. Based on this feedback questionnaire we have made the fsQCA analysis to determine the pathways leading to high and low intention to use the tool. The findings reveal three pathways leading to high intention to use PMMMs. The first pathway emphasizes user-centric perceptions, where ease of use (PEOU) and perceived usefulness (PU) are the main drivers, particularly in small, non-IT companies. The second pathway highlights the critical role of tool robustness in enhancing confidence and applicability, especially in larger organizations. Conversely, low intention is strongly associated with the absence of understandability and utility. This thesis has multiple theoretical and practical contributions.

1. First, it contributes to the management literature by revealing digitalization trends and paths for MC companies. Our CIMO analysis yielded practical DT enablers applicable within MC companies. Hence, it contributes to the borader theme of the digitalization and disruption potential of DT within MC stated by (Christensen, Dina, and Derek 2013).;
2. Second, it contributes to the broader PM literature by encompassing in the research newer developments like the PMBOK 2021 and new artifacts like the web-based PMMM. Particularly, it contributes to extending and filling in some gaps existent in the PM maturity by overcoming persistent limitations traditional MMs have. Our model might serve as a

starting point for researchers or practitioners who want to develop web-based MM in a given domain. As part of this contribution, we mention the highly descriptive procedure of our PMMM development. Since we observed the need for more detailed descriptions of PMMMs building and development, part of this research goals is to at least partially cover this gap;

3. Third, this thesis integrates the theoretical foundations of PMMM development with the digital affordances of online tools, resulting in a web-based platform for PMM self-assessment. By transitioning from an initial Google Sheets-based model to an interactive online version, the tool becomes significantly more scalable, accessible, and user-friendly, enabling broader adoption and real-time usability across diverse organizational contexts;

4. Fourth, this research extends TAM by demonstrating that contextual variables such as company size or industry type influence the relationship between user perceptions and intention to use. Additionally, our findings contribute to the PMMM literature by emphasizing that organizational maturity is not a prerequisite for adoption, contrary to prior assumptions. The first three paths leading to high intention to use are characterized by the strong presence of TAM variables PEOU and PU. The custom variable Robustness of the tool also emerged as a key contributor in two paths. The results show that the strongest motivation for usage is given by the presence of both PEOU and PU particularly in non-IT and smaller companies (Pathway 1). Although this is the first study to apply TAM and fsQCA to a PMMM, the significant contribution of PEOU or PU were also found when measuring other PM tools like ERP (Kwak et al. 2012; Vărzaru 2022) or learning management systems (Eraslan Yalcin and Kutlu 2019). Besides the core TAM variables, we have extended the measurement variables palette by introducing both static variables (maturity score, industry, and company size) and custom variables (Perceived Robustness of the tool, Perceived Understandability). Coupling either PEOU or PU with Robustness also yields high intention to use (Pathways 2 and 3). This suggests that regardless of the industry, size, or maturity level, if PMs regard the tool easy, intuitive and reliable their intention to use it is high. At the opposite, pathways leading to low intention to use point to the core role of Perceived Understandability. When users perceive the tool's interface unstructured or requirements unclear, the intention to use drops significantly, mainly in larger organizations.

Our findings show the unique perspectives TAM and fsQCA could bring in PMMM literature. For instance, the results indicate that high intention to use is driven not by organizational factors like industry or maturity, but by individual perceptions of the tool's usability and reliability. The maturity level of an organization does not independently influence the intention to use a PMMM; an observation that implies that even organizations at lower maturity levels might be open to adopt MMs, if the tool is perceived as reliable and intuitive. These findings widen the applicability of PMMMs for small or medium companies, since they imply no budgetary pressures or prior PM expertise.

For practitioners, our findings suggest prioritizing user-friendly designs and robust functionality, particularly for smaller organizations with fewer structural constraints. Developers should consider integrating feedback mechanisms to ensure tools meet the unique needs of different organizational contexts.

Our findings show the critical role of user-centric variables in PMMM adoption and challenges traditional assumptions about MMs. By integrating TAM and fsQCA, this research provides a nuanced understanding of adoption pathways and lays the groundwork for further exploration in the DT of project management tools.

Although this thesis makes both theoretical and practical contributions to the PM literature, it has inherently some limitations that need to be described:

1. An important current limitation in this version of the app is lack of benchmarking. It is acknowledged in the literature that one feature of a MM is to compare an organization practices and outputs with others from both the same domain and outside of it (E Fabbro and Tonchia 2021). This feature is intended to be added in a future version of the app;
2. Domingues and Ribeiro (2023); and Brookes et al. (2014) found that established MMs could be analyzed thanks to their validation history, as for the newer MMs this type of validation is lacking. This is another limitation in our study since we are suggesting a new PMMM based on the PMBOK 2021, extensive validation would be required to become an established model. Another limitation that derives from this first one is that the subjective nature of determining the level of maturity makes it important to use an assessment tool that has been tested and proven to achieve consistent and correct results (F. Backlund, Chronéer, and Sundqvist 2014; L. Crawford 2006b; Tarhan, Turetken, and Reijers 2016). As mentioned, since we propose a new PMMM, no previous or repetitive validation could have been carried out.

3. Another limitation is that the theoretical structure of the questionnaire comes from PMBOK 2021 and no tailoring for the economic national context is envisioned. The national business environment significantly influences project success (M. M. de Carvalho, Patah, and de Souza Bido 2015; Hartono, F.N. Wijaya, and M. Arini 2014). The implementation of a maturity model won't identify and solve all the company's issues. The model should serve as an improvement guide rather than a solution-wide provider. Our model lacks the comparative feature which allows internal or cross industry benchmarking (Pöppelbuß and Röglinger 2011a). Unfortunately, the findings are relying on a relatively small quantity of data, 16 responses. The geographical area of the respondents was confined to Romanian PMs mostly working for multinational companies. Although the tool was shared via LinkedIn to multiple PM groups worldwide, there were no answers outside Romania. Also, deriving from Mullaly (2014) findings regarding the relevancy of organizational context, it might be considered as a future measurable variable (Kwak et al. 2015b). Including the organizational context as a new measurable variable will help to capture better feedback and possibly build new relevant pathways regarding users' intention to use such a PMMM.

4. Finally, MMs inherently become obsolete because of changing conditions, technological progress or new scientific insights. If an unchanged MM is supposed to be permanently valid for its problem area, it needs to be validated regularly by appropriate evaluations. Modifications that may become necessary in time can be accommodated in a new model version. In time, this model may become invalid and replacement with a more integrated, newer model might be necessary.

From a theoretical and research perspective, an intriguing avenue for future study would be a longitudinal case study focused on a single organization adopting the PMMM. This research could capture an initial snapshot of the organization's current PM practices and then track the real-life implementation of the tool's recommendations. By closely observing how management interprets and applies these recommendations, researchers could assess the feasibility of implementation, identify potential challenges, and evaluate the impact of the PMMM on the organization's overall PMM. This approach would provide valuable insights into the practical effectiveness of PMMMs and their role in driving organizational improvement.

Future research avenues are abundant, particularly in enhancing the web-based PMMM platform with AI-driven capabilities. An interesting next step might be integrating an authentication module that allows users to track their MM results over time, enabling personalized performance monitoring. AI could further refine this by providing real-time performance insights through predictive analytics, identifying potential project risks, and offering tailored recommendations for improvement. Additionally, AI-driven benchmarking could address one of the key limitations of existing PMMMs by enabling dynamic comparisons across industries, automatically identifying best practices, and detecting inefficiencies. Machine learning models could analyze historical assessment data to generate adaptive benchmarks, ensuring organizations remain aligned with evolving project management standards. AI-powered sentiment analysis could also assess organizational PM maturity by processing project documentation and stakeholder communications. Integrating AI with enterprise tools like Jira, Trello, or Asana would allow automated tracking of project management practices, while the concept of digital twins could be explored to simulate different maturity scenarios and visualize the impact of PMMM-driven improvements. Over time, AI-enhanced PMMMs could evolve into adaptive, self-learning systems that refine their assessment criteria based on emerging industry best practices, ensuring their relevance in a rapidly digitalizing business environment.

Another new technical feature could focus on expanding the pool of respondents beyond Romania, enabling cross-country comparisons of PM practices. This would provide valuable insights into how different cultural, economic, and regulatory environments influence project maturity and management methodologies. By leveraging AI-driven data collection and analysis, the platform could dynamically identify regional trends, best practices, and potential gaps in PM adoption worldwide. Alternatively, a more localized approach could deepen the analysis within Romania by increasing the number of Romanian PM respondents and establishing a theoretical link between PM maturity and national project management practices. This could contribute to a more nuanced understanding of PM development in Romania, identifying key industry-specific challenges and opportunities for standardization or policy recommendations. Moreover, incorporating AI-powered language translation tools would facilitate broader participation from international PMs, ensuring inclusivity and enabling comparative studies across diverse regions.