

Agile Meets Digital: A Systematic Literature Review Based on the Current State of Co-development of

Agile Project Management and Digital Transformation

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Abstract

With the rapid development of globalization and information technology, digital transformation has become a necessary strategy for enterprises to maintain their competitiveness in the fiercely competitive market. Agile project management, as a flexible and efficient management approach that can quickly adapt to market changes and customer needs, is considered to play a key role in the digital transformation process. In order to explore the interrelationship between agile project management and digital transformation, this study conducts a systematic literature review of existing references, finds 1035 papers, and then reduces to 33 articles by utilizing PRISMA guidelines. This systemic literature review revealed that there is a mutually reinforcing relationship between agile project management and digital transformation. The findings of this article synthesize 13 themes and topics related to the relationship between agile project management and digital transformation and finally explore each subject separately.

Key words: Agile Project Management; Digital Transformation; Systematic Literature Review; PRISMA Method.

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1. Introduction

Agile project management and digital transformation have undoubtedly become well-known concepts in the context of the arrival of the post-epidemic era (Ciampi et al., 2022). When the global epidemic came, governments advocated avoiding face-to-face contact and replacing it with online meetings, remote control and operations (Rojas et al., 2024; Verhoef et al., 2021). At the same time, considering the innovation and development of digital technology, and the pressure from market competition (Zhu & Iansiti, 2012), which stimulates decision makers to pay more attention on how to use digital tools to collect, concatenate and process data (Brynjolfsson & McElheran, 2016). On the other hand, Customers and other stakeholders are changing their consumption and regulatory patterns (Haudi, 2024). In order to quickly respond to the company's external changes, agile project management approach has entered the field of vision of these leaders (Saputra et al., 2022). Taking into account the special circumstance, the discussion of the potential relationship between agile project management and digital transformation may therefore have received more attention (Lamacchia, Chowdhury & Sharif, 2020; Wu, 2022; Marek et al, 2019).

The definition of digital transformation is relatively broad, and different interpretations have been attempted based on diverse background and perspective (Vial, 2019). Some describe digital transformation as a form in which organizations use technology to fundamentally improve their performance, this includes reducing production costs, accelerating iteration rates and reducing labor costs by using Internet of Things, big data, artificial intelligence, machine learning and other digital tools. (Westerman et al., 2011; Karagiannaki et al., 2017). While others define digital transformation as using new digital technologies and tools to change the business and operation approaches, such as enhancing customer experience, streamlining operations, or creating new business models (Fitzgerald et al., 2014; Liere-Netheler et al., 2018). This study adopts the definition of digital transformation as enterprises, governments, and social organizations use digital technologies to redefine market strategies, products, and services. By changing their internal management approaches, operation management, customer experience and business model to response the external demands and uncertainties and finally enhance their competitiveness and innovation capabilities (Vial, 2019; Nwankpa & Roumani, 2016; Verhoef et al., 2021). This definition represents a more comprehensive and theoretically grounded conceptualization of digital transformation in current research. First, it highlights not only the application of digital technologies but also emphasizes the strategic dimension of digital transformation, clearly stating that organizations must leverage

digital technologies to redefine their market positioning and value propositions in the digital era (Bharadwaj et al., 2013; Vial, 2019). Second, it underscores the deep transformation of internal management approaches and operational processes, which closely aligns with the principles of agile project management, particularly in fostering cross-functional collaboration and organizational flexibility (Westerman et al., 2014; Schallmo et al., 2017). Third, the definition positions digital transformation as a proactive response to a rapidly changing external environment, reflecting a logic of organizational adaptability (Nadkarni & Prügl, 2021; Verhoef et al., 2021). Finally, it situates the core objective of digital transformation in enhancing competitiveness and innovation, thereby providing a solid theoretical foundation for subsequent studies on organizational performance and innovation capabilities (Nwankpa & Roumani, 2016; Spoladore & Pessot, 2022). In sum, this definition is supported by a wide range of academic literature and offers strong practical relevance, making it a suitable working definition of digital transformation for this study.

However, the success of digital transformation is not easy. There are many complex factors that impede the success of digital transformation. Some of the reasons come from within the organization: (i) Traditional organizational culture and mindset may resist digital transformation (Vigal, 2019; Wessel et al., 2021); (ii) The organization fails to respond quickly to changes in market demand, customer behavior and competitive landscape through digital tools (Oludapo et al., 2023); (iii) Insufficient data sharing and collaboration between different departments and business systems leads to information silos (Sambamurthy et al., 2003; Vigal, 2019). Agile project management, in this situation, is mentioned in previous articles as one of the approaches to help organizations develop digital transformation (D' Aniello, 2023). Many studies have emphasized that agile project management is a critical enabler of successful digital transformation, as it facilitates organizational flexibility, rapid experimentation, and cross-functional collaboration (Vial, 2019; Rigby et al., 2016; Matt et al., 2015; Hanelt et al., 2021). These characteristics help firms adapt to technological disruption and execute digital strategies effectively.

Agile project management is based on practices, values, and conceptual frameworks, and is implemented through agile methods such as Scrum, Kanban, and other agile tools (Highsmith, 2009). The Association for Project Management describes agile project management as an iterative approach to delivering a project throughout its life cycle (APM, 2022; Rigby, Sutherland, & Takeuchi, 2016; Conforto et al., 2016; Hoda, Noble, & Marshall, 2018).

Investigating the relationship between digital transformation and agile project management has its own importance. The first reason is that both of which are closely

related in dealing with uncertainty, promoting organizational change and improving business performance (Vial, 2019; Oludapo et al., 2023; Škare & Soriano, 2021). Digital transformation involves technology upgrades, business process reengineering and profound changes in organizational culture, and is the key for enterprises to remain competitive in an era of globalization and rapid technological development (Rüßmann, et al., 2015; Menzel & Macaulay, 2015). However, the complexity and high failure rate of digital transformation make it difficult for traditional project management methods to meet their needs for flexibility and rapid response (Serrador & Pinto, 2015). Agile project management can significantly improve the success rate of digital transformation projects through iterative development, continuous feedback and cross-functional team collaboration (Rigby, Sutherland, & Noble, 2018). Agile methods place special emphasis on rapid adaptation to change, customer-centricity and self-organizing teams (Beck et al., 2001), which are highly consistent with the core goals of digital transformation. In addition, agile project management can help companies maintain flexibility in a rapidly changing environment, while improving customer value and user experience through frequent delivery and feedback optimization (Dingsøyr, Nerur, Balijepally, & Moe, 2012). Related research shows that organizations adopting agile project management practices not only help improve project success rates but also lay a solid foundation for the organization's long-term digital strategy (Serrador & Pinto, 2015; Schwertner, 2017). Therefore, exploring the relationship between the two can not only provide new perspectives for theoretical research, but also provide clear guidance for corporate practice, and provide important support for promoting digital transformation in an uncertain environment (Vial, 2019; Hansen & Sia, 2015; Shams et al., 2021).

However, despite the growing practical relevance of both agile project management and digital transformation, limited academic research has systematically stated how organizations create values by exploring the relationship between agile project management and digital transformation. One reason is that the literature on agile project management and digital transformation have evolved along parallel but largely disconnected trajectories. As Hanelt et al. (2021) point out in their systematic review, most digital transformation studies focus on strategic alignment, digital capabilities, or organizational change, while agile methods are typically discussed in the context of software development or IT project execution. Similarly, Vial (2019) highlights that while agility is often mentioned as a component of digital transformation, few studies explicitly investigate agile methodologies as a mechanism or enabler of digital transformation.

In addition, Conforto et al. (2016) note that agile project management research has traditionally concentrated on operational aspects within software engineering, and only recently has it started to expand toward broader organizational and strategic domains. The lack of integrated conceptual frameworks and shared terminology between agile project management and digital transformation communities further constrains cross-domain research. Consequently, there exists a significant theoretical and empirical gap in understanding how agile project management contributes to or interacts with digital transformation at the organizational level. Thus, this article will attempt to answer the following research question to fill the gap by doing a systematic literature review:

What is the relationship between agile project management and digital transformation?

A systematic literature review is a rigorous literature analysis method in which researchers identify, evaluate, and summarize existing literature in a specific research field in a systematic and transparent manner. The purpose is to integrate existing research results to reveal the knowledge base, gaps, and future directions in the research field (Tranfield et al., 2003; Kitchenham, 2004). The method and guideline this article will use is the PRISMA statement (Preferred Reporting Items for Systematic Reviews and Meta-Analyses). For which is developed from the Quality of Reporting of Meta-Analyses to revise and summarize the established reporting standards for SLRs and meta-analyses (Sarkis-Onofre et al., 2021). The PRISMA Guide consists of a 27-item checklist and a four-stage (search, screening, inclusion, and synthesis) flowchart (Pagea et al., 2020).

To conclude, agile project management and digital transformation with their relationship are the key points of this research, and the following chapter will concentrate on the theoretical background. The research methods of this paper will be introduced in the third chapter. The results of the comprehensive literature review are visualized in the fourth section. The outcomes of the previous analysis are discussed in the fifth section. The sixth chapter examines the conclusions, with its limitations and future directions for agile project management and digital transformation.

2. Theoretical Background

2.1 Digital Transformation

2.1.1 Characteristics & Effects of Digital Transformation

Digital transformation (DT) is the term that encompasses the modern digital technologies, which include all types of Clouds platforms to create or adapt business processes, culture and customer experience. The fundamental purpose of DT is to

respond to fluctuating marketing and sundry demands (Ernst & Frische 2015). Similarly, agile also requires the participation of partners or stakeholders, these people can be suppliers, customers, and other shareholders and any relevant departments and individuals. In order to quickly respond to the needs of stakeholders, agile project management also requires a transparent platform or internal system, which is also the most intuitive benefit that digital transformation brings to agile project management (Jagtap & Duong, 2019). To some extent, the advancement of these digital technologies will determine the direction of human society (Posada, et al., 2015). These disciplines are increasingly becoming directions and important issues in the development of digital technology (Rüßmann, et al., 2015). The impact of digitalization is reflected in three main areas, which are (i) processes and operation, (ii) products and services offered by organizations, and (iii) digital business models. Indeed, technology has altered how individuals work and enabled the automation of certain tasks (Menzel & Macaulay, 2015; Humble & Farley, 2010). For agile project management teams, digital transformation will provide them with a more convenient working environment, which will help them communicate with stakeholders, collect data and analyze it through the platform, so as to respond quickly and effectively (Ciampi, et al., 2022).

2.1.2 Purpose & Foundation of Digital Transformation

The purpose of an organization adopting digital transformation is to enable it to continuously adapt to the changing external environment (Škare & Soriano, 2021). One of its goals is to establish the technical and operational foundations to continuously evolve and respond in the most appropriate way to unpredictable and constantly changing customer expectations, market conditions and local or global events (Bendig, et al., 2017). Indeed, while many organizations undergo digital transformation in response to a single competitive threat or market change, digitalization is not a one-time event.

With the customer-oriented market as the main part, organizations need higher quality products, services, greater adaptability and customization to meet the challenges (Henriette et al., 2016). Therefore, every organization using a digital model should clearly define the main way of digital transformation, as well as the system tools and human resources required in the transformation process (Lee et al., 2006). When digitalization becomes the mainstream of the market, it requires organizations to have a clear vision, especially since digital technology remains the core competitiveness of enterprises in the global market (Vial, 2019; Schwertner, 2017). In fact, establishing a digital model and trying to maintain normal business operations is a very difficult but indispensable process (Fischer et al., 2020).

2.1.3 Process & Capabilities of Digital Transformation

The goal of digital transformation is to build a complete digital management model and analysis system for the enterprise. Its main capabilities include three aspects. The first is the digitization capability of enterprise assets (Verhoef, et al., 2021), which includes digitizing the storage data, information data and related facilities and technologies (Yoo, 2010). The application of technology and data is the basis for determining whether a company can create additional value recently.

The second is the ability of enterprise digital networking. Digital networking capability refers to the ability of an organization to bring different users and stakeholders closer together through digital tools and try to meet different needs simultaneously (Verhoef, et al., 2021). In the case of user demand-oriented, the direction of enterprise decision-making comes more from the concerns of stakeholders (Teece, 2010). Reflecting the behavior of customers and stakeholders on a common virtual platform will help companies formulate marketing strategies and ultimately create value (Hansen & Sia, 2015). At the same time, the digital network platform will also have its own value, considering the complexity of stakeholders, such as suppliers, loyal customer groups, and other third parties will all obtain and exchange information on the same platform and speed up the process of cooperation.

The third is big data analysis capabilities (Warner & Wager, 2019). In order to achieve digital transformation, companies also need to combine internal data with other organizational resources to change the way they conduct business, and the analysis capabilities of big data will determine the company's operating model (Loebbecke & Picot, 2015), resource allocation, risk management and other organizational behaviors. Enterprises need specific digital tools to screen and process the huge database in the market (Verhoef, et al., 2021).

2.2 Agile Project Management

2.2.1 Characteristics of Agile Project Management

Agile project management teams can react faster because agile project management always pays attention to handling customer requirements by using short development cycles, or also called iterations, and then change and adaptation throughout the project lifecycle (Conforto & Amaral, 2016). By currently establishing each project's essential modules, they can reduce design and development costs and improve customer satisfaction (Kommission, 2015). Recently, due to the ability that agile project management adds value for businesses, it is appropriate for various project types instead of just being utilized in software development projects (Conforto et al., 2014). For businesses, governments, and other organizations to deal with the external environment, which includes opportunities and threats, it can be claimed that

the methodology centered on agile project management is the optimum management model (Solheim, et al., 2023).

2.2.2 Purpose of Agile Project Management

Agile projects management is built to deal with change and uncertainty. As the product manager needs to be clear on the project milestones and final deliverables in order to effectively lead cross-functional teams in the management process, agile project management teams need to always maintain effective communication with their customers and stakeholders (Van Oosterhout et, al., 2006). This is because agile project management methods emphasize the requirements of the customers through the development and testing of core components during the production cycle, ultimately delivering a satisfactory outcome for their customers (Tallon & Pinsonneault, 2011).

2.2.3 Agile & Agility

The definition of agile will be more complex. Agile is an incremental and iterative way of working that accommodates uncertainty and allows multiple stakeholders to collaborate, participate in the work and shape the outcome (Baxter & Turner, 2020; Lei et al., 2017). Or it is described as the organization's ability to respond quickly and effectively to unexpected changes in market demand (Prange, 2021). Agile methods are designed to deal with change and uncertainty through highly iterative development that relies on project goals and content and emphasizes informal collaboration (Lappi, et al., 2018). The principles and values of implementing agile come from the Agile Manifesto. The Agile Manifesto does not provide specific techniques or tools, but rather provides guiding principles and core values that lay the theoretical foundation for agile methods (Agile Manifesto, 2001; Beck et al., 2001). This manifesto helps agile teams focus on rapidly adapting to changes, improving delivery capabilities, and enhancing customer satisfaction, thereby operating more effectively in an uncertain environment (Beck et al., 2001; Hohl et al., 2018; Zaitsev et al., 2018; Dingsøyr et al., 2012; Abrahamsson et al., 2002).

Agility refers to the ability of an individual, team or organization to quickly respond to environmental changes and adjust strategies or methods to adapt to dynamic needs. This ability is widely used in business management, project development, organizational operations and other fields, and is the core of competitive advantage in modern complex environments (Holsapple & Li, 2008; Motwani & Kataria, 2024).

2.3 Corporate Strategy of Agile Project Management & Digital Transformation

Corporate strategy is a decision made by corporate managers to strive for market competitiveness and realize the needs of stakeholders by formulating a unique operating model or guiding framework for the organization (Garri, et al., 2013). The early integration of agile project management and digital transformation was presented in the form of enterprise strategy. Some parts of the literature believe that agile project management can provide a certain amount of management advice. If product managers lack a strategy and don't change it when necessary, their responsibilities are limited (Teece et al., 2016). Organizational agility is not exactly the same as agile project management, although they both emphasize rapid response to stakeholders' demands and market changes, organizational agility is a more macroscopic item. Agile project management, on the other hand, is more specific at the micro level. In such cases, a part of the literature argues that organizations need to develop sufficient agility or implement digital transformation by using agile project management models (Shams et al., 2021).

However, someone may add that product managers can sacrifice agility to complement the digital transformation process (Teece et al., 2016). Other multiple literature argues that organizations must understand that agility is a corresponding method for complex projects. It focuses on specific applications and issues that accompany organizational change, including (i) strategic analysis, which focuses on gaining insight into an organization's current and future competitiveness; (ii) strategic choice, which involves deciding which options or configurations to adopt; (iii) strategy implementation (McCarthy & Tsinopoulos, 2003). This is why a growing number of researchers are calling for organizations to acquire strategic agility (Franken & Thomsett 2013), with an emphasis on quickly and flexibly adapting to unforeseen changes in the external environment. Therefore, in past literature, the relationship between agile project management and digital transformation is not consistent. But this does not mean that digital transformation and agile project management, or agility cannot coexist. On the contrary, as we discussed before, considering the demand for data and the commitment to stakeholders in digital transformation and agile project management, The needs of the organization will likely bring the two together (Ciampi, et al., 2022).

3. Method

A systematic review is a highly rigorous evaluation of the existing literature on a well-defined topic using sophisticated, reproducible methods that result in a minimum of bias (Okoli, 2015). This requires researchers to systematically search, identify,

select, evaluate and synthesize research evidence relevant to the topic. Considered the better source of research evidence, systematic reviews play a critical role in evidence-based research and are highly regarded in all fields (Okoli, 2015). Given the subjectivity of each researcher's cognition of affairs, and the certain bias of the audience looking for clues, information from past literature will be missed and hinder the objective development process (Tranfield, 2003; Gioia, Corley & Hamilton, 2012). Therefore, it is very meaningful to find a reliable methodology for systematic literature review.

A scoping review is a widely recognized practice in the early stage of literature review. Its main element is to delineate the qualified references database and then screen it through additional criteria. The screening approach used in reviewing the relevant literature in this paper follows the framework outlined by Arksey and O'Malley (2005), primarily through the systematic literature review requirements in PRISMA (Pagea, et al., 2020): (i) determining the scope of the literature (ii) Determining the inclusion and exclusion criteria for screening references (iii) Complete the screening process (iv) Draw a flowchart of the screening results, and finally (v) Summarize the research results. Screening for this scoping will be done according to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Extension for Scoping Reviews (PRISMA-ScR) statement (Sarkis-Onofre, et al., 2021).

3.1 PRISMA Guideline

PRISMA was first applied in the field of clinical medicine, but with the wide application of systematic literature review articles in various disciplines (Tricco et al., 2018; Pagea, et al., 2020; Moher et al., 2009), the new guidelines of PRISMA are no longer limited to a single field (Moher et al., 2009; Page et al., 2021). Compared with other existing templates and guidelines, PRISMA has been constantly updating the system content and entries to cater to the development of different academic fields, and already has a mature system (Moher et al., 2009). Therefore, this paper chooses PRISMA as the theoretical framework and the theoretical basis of systematic literature review. Though the PRISMA guideline includes systematic literature review and meta-analysis in the common checklist, this article will only use the former part by considering the characteristics of the research object, the checklist is shown as Appendix 1- 2020 PRISMA Checklist.

3.2 Search Strategy

This article conducted a comprehensive database search on references among “Scopus” and “Web of Science” as the databases. The reasons for choosing these

databases are, on the one hand, they are the most comprehensive literature databases in the world (Burnham, 2006), and the second reason is that the preferences of the social science and business articles they include are completely in line with the scope of this article. The main keywords used in this article are “agile” and “digital transformation”. However, considering that the authors of each article have their own specified research preferences, the author of this paper appropriately expanded the scope of keyword screening when searching the literature. In general, the words and Boolean algebra related to “digital transformation” are replaced by “digital transformation” OR “digitalization”. Digitalization or digitalization refers to the process by which businesses and organizations collect and analyze data about their assets through advanced digital technologies, resulting in fundamental changes to their business processes, with the aim of bringing about new business models and leading social change.

Although the meanings of digitalization and digital transformation are not exactly the same, the demands to change the business models and processes of enterprises through digital tools are similar, so we assume that digitalization and digital transformation are interchangeable concepts in this paper. At the same time, in order to effectively narrow the scope of the search, the author added artificial restrictions in the use of Boolean operators. In this situation, the search order in Web of Science and Scopus is (“agile” AND (“digitalization” OR “digital transformation”)). The limitations of our search strategy are: (i)Only in English; (ii)The types of these articles are Conference paper, Conference review, Article, Review; (iii)The source publication types are only in Conference Proceeding and Journal. Therefore, the full order of the Boolean is:

TITLE-ABS-KEY(“agile” AND (“digitalization” OR “digital transformation”))
AND (LIMIT-TO(LANGUAGE, “English”))
AND (LIMIT-TO(DOCTYPE, “cp”, “cr”, “ar”, “re”))
AND (LIMIT-TO(SRCTYPE, “p”, “j”))

After removing the duplicated literature data among different databases, authors began to screen articles that fit topics related to agile project management and digital transformation after obtaining the titles and abstracts of the articles provided by the databases. First, the author made a graph based on the articles in the database for subsequent proofreading and confirmation of the inclusion results and obtained the subsequent deletion steps by reading all the articles.

Secondly, in order to prevent the automatic database screening system from missing valid paper data, the author browsed the reference section of these known

articles and paid more attention to relevant literature and considered them into the criteria.

In addition, common academic conferences will be published in a unified joint journal, so the authors will put the articles that meet the preliminary inclusion criteria into the list of candidates' articles and delete the initial joint journal. Finally, according to the already discussed restriction criteria, the author deletes the literature that does not meet the expectations and puts other literature into a new list to be judged using more detailed inclusion and exclusion criteria.

3.3 Inclusion & Exclusion Criteria

This study aims to investigate the relationship between agile project management and digital transformation. To ensure methodological rigor and thematic relevance, we established clear inclusion and exclusion criteria based on the PRISMA 2020 framework, covering four major phases of the literature selection process.

3.3.1 Stage 1: Identification

In developing the inclusion and exclusion criteria, this study aimed to enhance the scientific rigor, systematic structure, and reproducibility of the literature review. First, only Scopus and Web of Science—two leading academic databases—were selected as sources to ensure authority and comprehensive coverage. The search strategy employed Boolean logic, focusing on the core terms “agile” and “digital transformation,” thereby improving the thematic precision of the results. Furthermore, the review was limited to English-language publications, and grey literature such as books, industry reports, and web content was excluded to reduce the potential bias caused by non-academic sources or fragmented content structures. Duplicate records across databases were also removed to maintain the uniqueness and clarity of the dataset. Overall, this screening design not only enhances the academic quality and content relevance of the selected literature but also provides a robust foundation for the subsequent systematic review and qualitative analysis.

The following table shows the inclusion and exclusion criteria to identify the articles from databases.

Table 1 Identification

Criterion	Qualification
Exclusion Criteria	• Non-English publications. • Document types such as books, industry reports, editorials, or web content. • Duplicate records across databases.
Inclusion Criteria	• Literature was retrieved from Scopus and Web of

	Science, with the search conducted on March 1, 2023. • The search query used Boolean logic: (“agile” AND (“digital transformation” OR “digitali?ation”)). • Only articles published in English were considered. • To improve data precision, books and grey literature (e.g., websites, reports, white papers) were excluded due to their fragmented structure or lack of peer review.
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3.3.2 Stage 2: Screening (Title and Abstract)

In the second stage of screening (Title and Abstract), the inclusion and exclusion criteria were designed to enhance the thematic precision and research relevance of the selected literature. By requiring that both agile project management and digital transformation be explicitly mentioned in either the title or abstract, the screening ensured that only studies directly aligned with the core focus of this review were retained, thereby avoiding conceptual ambiguity or topic drift. Articles introducing new theoretical models or conceptual frameworks that systematically link agile project management and digital transformation were also included to capture innovative contributions and broaden theoretical perspectives. Moreover, the criteria emphasized a focus on ongoing digital transformation projects, rather than studies limited to strategic intentions or planned digital initiatives, thus enhancing the practical orientation and contextual comparability of the dataset.

Conversely, studies that addressed only agile project management and digital transformation in isolation, or those that lacked organizational or project-related contexts, were excluded to avoid the inclusion of literature with overly generalized or technically narrow discussions. Studies discussing digital roadmaps or strategic planning without implementation details were also filtered out to maintain a focus on actionable and process-based insights. Furthermore, papers with inaccessible full texts were excluded to ensure the completeness and verifiability of the data analysis. Overall, this stage’s criteria effectively balanced efficiency with academic rigor, producing a literature pool characterized by conceptual clarity, methodological integrity, and contextual relevance.

The following table shows the inclusion and exclusion criteria to screen the articles from databases.

Table 2 Screening

Criterion	Qualification
Exclusion Criteria	• Articles that mention only APM or only DT, without

	establishing a relationship. • Theoretical discussions lacking practical relevance or variable-based analysis. • Papers focused purely on digital technologies or agile techniques without reference to organizational or project contexts. • Studies discussing digital planning or roadmaps without implementation processes. • Full text not accessible after reasonable attempts.
Inclusion Criteria	• The title or abstract must explicitly mention both agile project management and digital transformation. • Articles that introduce new concepts or models linking APM and DT were also retained. • Studies must refer to ongoing digital transformation projects, rather than merely outlining digital strategies or intentions.

3.3.3 Stage 3: Included Research (Full-Text Review)

In the third stage of full-text review (Eligibility), detailed and explicit inclusion and exclusion criteria were established to ensure the theoretical rigor and analytical value of the selected studies. First, articles were required to provide clear definitions or conceptualizations of both agile project management and digital transformation, and to explicitly articulate the relationship between the two. This ensured that the included literature demonstrated conceptual clarity and logical coherence, providing a solid theoretical foundation for subsequent analysis. In recognition of the evolving nature of project management practices, studies discussing hybrid project management models—which integrate agile, traditional, or lean approaches—were also included, provided they reflected an integration of both agile project management and digital transformation. This criterion allowed the inclusion of cutting-edge and practically relevant research.

Furthermore, studies primarily focused on project management were accepted if they systematically addressed digitalization and agile practices within project processes, as such discussions are directly relevant to the research objective. A diverse range of methodologies (qualitative, quantitative, case study, and conceptual) was considered acceptable, as long as the study contributed meaningful insights into the relationship of agile project management and digital transformation. This inclusive approach enhanced the methodological diversity and theoretical breadth of the review.

Conversely, exclusion criteria were designed to remove studies with conceptual vagueness, thematic disconnection, or insufficient empirical grounding. Specifically, articles that mentioned agile project management or digital transformation only in passing without offering operational definitions were excluded. Studies that focused solely on digital tools or platforms without embedding them in project management contexts were also removed. Additionally, papers that failed to establish a coherent link between agile and digital themes, or review articles lacking original theoretical frameworks or empirical contributions, were not included. Overall, this stage of the screening process ensured that the final selection of literature possessed thematic depth, conceptual consistency, and research relevance, thereby reinforcing the analytical robustness of the study.

The following table shows the inclusion and exclusion criteria to select the articles from databases.

Table 3 Eligibility Articles

Criterion	Qualification
Exclusion Criteria	• Articles mentioning APM or DT only in passing or without operational definitions. • Research focusing solely on digital platforms or tools without project-level discussion. • Conceptual disconnection between agile and digital themes. • Review papers lacking novel theoretical frameworks or empirical findings.
Inclusion Criteria	• Articles must provide clear definitions or conceptualizations of both APM and DT and articulate their interrelationship. • Studies discussing hybrid project management models that combine agile, traditional, or lean approaches were accepted if they integrated both APM and DT. • Literature focusing on project management as the main topic was included if it also addressed the digitization and agile processes within projects. • Various methodologies were accepted (qualitative, quantitative, case study, conceptual), provided they offered insights into the APM–DT relationship.

3.4 Qualitative Methods

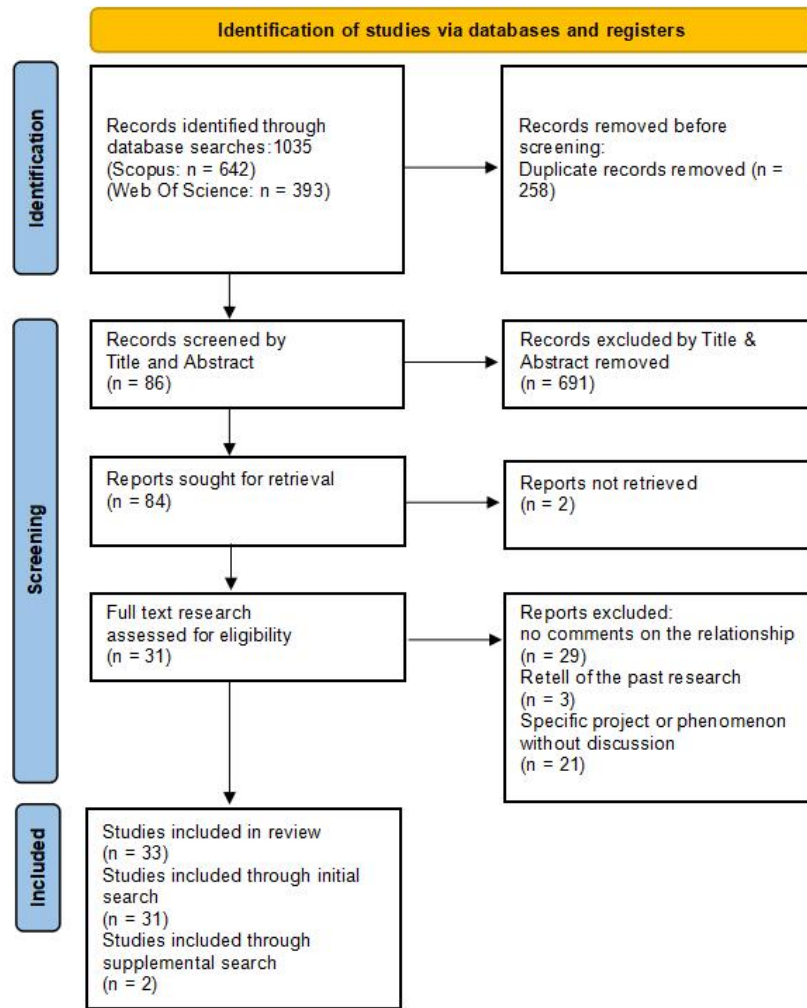
Qualitative research methods are particularly valuable for exploring complex social phenomena, capturing contextual depth, and identifying patterns in non-numeric data such as interviews, documents, and texts (Creswell & Poth, 2018). In the context of a systematic literature review (SLR), qualitative content analysis enables researchers to synthesize conceptual trends, theoretical frameworks, and methodological approaches across studies. NVivo, as a qualitative data analysis (QDA) software, serves as a powerful tool for conducting SLRs due to its ability to support advanced coding, thematic mapping, and pattern recognition across large volumes of unstructured data. This software is a very practical qualitative analysis tool by establishing three-level coding (Corbin & Strauss, 1990; Paulus & Lester, 2022), which is usually used to discover orderly rules from irregular information bases (Calman, 2002; Lakeman, 2008).

4. Results

4.1 Included Studies

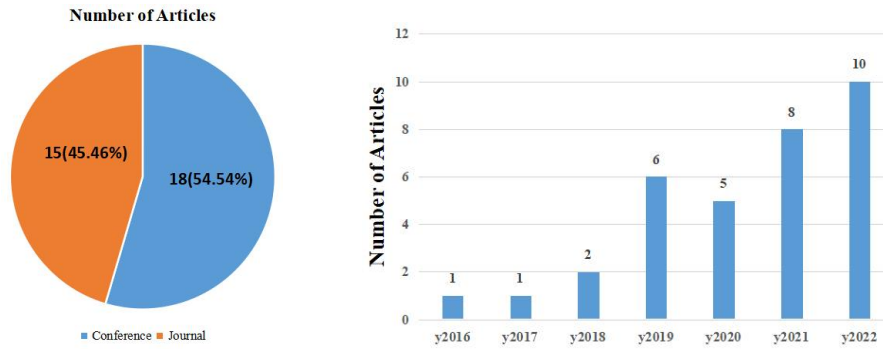
One of our researchers searched for references by using the search strategy independently, and others checked the process after that period. According to the initial screening method, 642 articles were generated from the Scopus database and 393 articles were generated from the Web of Science database. Articles were initially screened based on the content of titles and abstracts to ensure that each candidate met the inclusion criteria. At the same time, the two databases were compared to deleted duplicate articles, which included 258 references, and finally 86 documents were eligible to enter the precise screening stage. Next, we analyzed the full text of the generated articles, independently considered the admission and exclusion criteria for dividing articles, screened all articles in turn, and finally obtained 31 articles. In addition, considering the integrity of the data, we include articles that may not have been selected for the literature pool at the first time, and selected 2 additional articles according to the backward and forward citation chaining method (Webster & Waston, 2002), and finally got 33 references in this research. The PRIMSA-SCR flowchart in Figure 3 outlines the complete process of literature selection.

Figure 2 Outcomes of the PRISMA



According to the article categories provided by the database, the publication time span of the relevant articles selected by the author of this article is from 2016 to 2022. The number of publications peaked in 2022, with a total of 10 articles. When the number of documents increases, it can be proved that there are more topics related to agile project management and digital transformation in academia, which also proves the importance of this systematic literature review. On the other hand, according to the distribution between conference and journal articles, it can be concluded that the focus on agile project management and digital transformation is significantly higher in conference papers, where nearly two-thirds of the references are mentioned and analyzed as conference papers. A summary of the results can be found in the concept matrix in Figure 3.

Figure 3 Distribution of Publications



4.2 Industry and application scenarios

The integration of agile project management and digital transformation has manifested in diverse forms of practical exploration and theoretical inquiry across multiple industries. Research themes in this area demonstrate a high degree of industry sensitivity and contextual embeddedness.

In the manufacturing sector, scholars have examined how agile methodologies can be embedded into traditional production processes to achieve process agility and enhance supply chain responsiveness through digital technologies. For instance, Li et al. (2022), using an empirical sample primarily from manufacturing firms, found that during the COVID-19 crisis, companies relied on business analytics capabilities to drive digital innovation and agile responsiveness. Similarly, Rane and Narvel (2022) proposed integrating Industry 4.0 technologies and agile procurement mechanisms into project procurement processes to improve operational flexibility and decision transparency.

In the information technology and software industry, research focuses on the digital transformation of project management models. Babkin et al. (2022) argued that under the influence of Industry 4.0, traditional software project management approaches are being reshaped by agile methods and DevOps culture, resulting in the emergence of hybrid project management models. Hassani et al. (2018) further revealed that digital communication and collaboration platforms significantly accelerate the iteration rhythm within agile IT projects.

The public sector and energy industry have also drawn scholarly attention. AlNuaimi et al. (2022), in their analysis of public organizations in the United Arab Emirates, demonstrated that agile leadership plays a critical role in driving digital strategy implementation. Similarly, Veroba and Azmi (2021), through a case study of Malaysia's national oil corporation, PETRONAS, found that agile transformation supported the digitalization of front-end processes and facilitated cross-departmental collaboration.

The service sector, including marketing consultancy, finance, and insurance, has also been addressed in several studies. For example, Bhatnagar and Grosse (2019) investigated how agile work practices in the IT department of a marketing consultancy firm impacted employee satisfaction, reflecting the profound influence of digital technologies on organizational culture and employee well-being.

Overall, these studies indicate that the integration of agile project management and digital transformation is not merely a strategic tool for organizational survival but also represents an evolving organizational capability for navigating complexity across industries. Each industry brings a distinct focus to this integration: manufacturing emphasizes process agility, finance emphasizes data-driven strategy, the IT sector focuses on development efficiency, and the public sector prioritizes organizational responsiveness. These industry-specific concerns lay a valuable foundation for future research in cross-sectoral and contextually grounded studies.

4.3 Research methods, theories and approaches

In terms of the research method of the article, except for two articles which adopt the method of quantitative analysis, the rest of the articles adopt qualitative research. The table below shows the statistical results of the research methods adopted by all articles.

Table 2 Research Methods

Methods		Author(s)
Quantitative Analysis (n = 2)		Dehnert & Santelmann. (2021) Kohnová, et al. (2022)
Qualitative Analysis (n = 31)	Case Study (9)	Marek et al. (2019) Bhatnagar & Grosse. (2019) Wu. (2022) Plattfaut. (2022) Veroba & Azmi. (2021) Burchardt, & Maisch. (2018) Zelfia, Simanungkalit, Raharjo & Teguh, (2022) Aasi, Gråhns, Geijer, & Rusu, (2022) Elisa, Suhono Harso & Kosala, (2020)
	Phenomenology (4)	Poeppelbuss, Ebel & Anke. (2021) Rane & Narvel. (2021) Pajares, et al. (2017) Dobos, et al. (2022)
	Action Research (6)	Hofmann, Samp & Urbach. (2020) Phalake & Joshi. (2020) Allen. (2019) Kozarkiewicz. (2020) Guinan, Parise, & Langowitz, (2019) Saputraa & Sasanti, (2021)
	Grounded Theory (9)	Lamacchia, Chowdhury & Sharif. (2020)

		Burchardt & Maisch. (2019) Barbosa & Pego Saisse. (2019) Tyagi, et al. (2021) Rachida Hassani, Idrissi & Abouabdellah. (2018) Wiechmann, et al. (2022) Babkin. (2021) Gurusamy, Srinivasaraghavan & Adikari. (2016) Marx, Flynn & Kylänen. (2021)
	Literature Review (3)	Schlömer. (2022) Marnewick & Marnewick. (2022) Ciampi, (2022)

This literature review reveals a diverse range of purpose-driven orientations in both research intent and presentation of findings, which can be categorized into five primary thematic tendencies:

First, approximately one-third of the reviewed studies focus on theoretical construction and conceptual innovation. For example, Ciampi et al. (2022) systematically proposed a triadic relational model encompassing digital capability, agile strategy, and organizational performance, thereby offering a structural theoretical proposition for future research. Similarly, Schlömer (2022), through systematic literature selection, identified five enabling mechanisms through which agile project management facilitates digital transformation, emphasizing the necessity of capability reconfiguration and transformational thinking.

Second, empirical studies serve as the primary means for validating theories and testing variable relationships and are prominently represented in literature. For instance, Saputra et al. (2022) demonstrated the moderating role of digital capability in the relationship between agile leadership and organizational outcomes. Niu et al. (2023) conducted a panel data analysis to quantify the marginal effects of digital transformation on innovation performance, providing data-driven insights for policy and strategic decision-making.

Third, tool-oriented research concentrates on the development of management models and strategic frameworks. Rane and Narvel (2022), for example, employed TISM and MICMAC methodologies to construct a structural diagram for agile procurement strategies, offering a visualized and actionable framework for project procurement management.

Fourth, a number of studies display a strong inclination toward policy guidance and governance recommendations. AlNuaimi et al. (2022) advocated for the establishment of cross-functional agile task forces in the public sector to mitigate the risks of digital “formalism.” Niu et al. (2023) further recommended the provision of

policy-level financial support for digital transformation initiatives to enhance corporate innovation capacity.

Finally, several studies adopt a practice-based and action-learning approach. For example, Veroba and Azmi (2021), as well as Marek et al. (2019), presented descriptive case studies that illustrate both the practical application and challenges of agile mechanisms in digital transformation projects, offering concrete pathways for peer organizations to reference and adapt.

In summary, current research in this field has evolved from pure theoretical validation toward the development of practical tools, policy coordination, and actionable frameworks. This progression indicates a high level of theoretical sophistication and contextual relevance, providing important insights into how organizations in the digital era may respond to complexity and enhance agility.

4.3 Three-Level Coding Results

The following table is the result of the three-level coding, from which shows the connection between agile project management and digital transformation.

Table 3 The Three Level Coding from References Analyze

First Level of Open Coding	Second Level of Axial coding	Third Level of Selective Coding	Supporting Literature
•Agile methods insist on being user-centric •Agile project management seeks more frequent communication with stakeholders •The organization's internal processes need to be agile and customer-centric •Agile better respond to stakeholder needs •Digital capabilities enhance agile project management's ability to respond to customer requirements •Digital transformation facilitates customer experience •Agile project management provides more efficient services to customers	Support customer centric	Mutual development of Agile project management & digital transformation	Burchardt & Maisch, 2019; Poeppelbuss, Ebel & Anke, 2021; Barbosa & Pego, 2019; Rane & Narvel, 2021; Tyagi et al., 2021; Phalake & Joshi, 2020; Pajares et al., 2017; Rachida, Idrissi & Abouabdellah, 2018; Marek et al., 2019; Wiechmann et al., 2022; Kohnová et al., 2022 Kozarkiewicz, 2020; Gurusamy, Srinivasaraghavan & Adikari, 2016; Marx, Flynn & Kylänen, 2021; Zelfia, Simanungkalit & Raharjo, 2022; Aasi et al., 2022; Guinan, Parise, & Langowitz, 2019; Ciampi et al., 2022; Plattfaut, 2022; Schlömer, 2022; Dehnert & Santelmann, 2021
•Agile project management supports making high-quality decisions •Digital transformation makes decision-making more accurate	Agile Strategic Enablement		Wiechmann et al., 2022; Kozarkiewicz, 2020; Wu, 2022; Indriasari, Supangkat & Kosala, 2020; Ciampi et al., 2022; Lamacchia, Chowdhury & Sharif,

and efficient •Agile project management plays important role in leadership •Digital transformation influences leadership style •Agile project management helps digital transformation address uncertainty •Agile methods can better react quickly to changes •Agile methods can stay flexible for uncertainty •Digital capabilities can cope with uncertainty •Digital transformation requires organizations to be able to respond to uncertainty •Agile project management focuses on customer needs to cope with complexity •Agile responds quickly to opportunities and risks •Agile project management requires a cross-functional team approach •Digital transformation requires cross-functional teams •Agile methods emphasize the importance of communication •Digital transformation strengthens communication capabilities •Agile project management plays important role in leadership •Digital transformation influences leadership style	Cope with uncertainty Cross-Functional Collaboration and Communication		2020; Schlömer, 2022; Guinan, Parise, & Langowitz, 2019; Saputraa et al., 2021; Schlömer, 2022 Hofmann, Samp & Urbach, 2020; Poeppelbuss, Ebel & Anke, 2021; Barbosa & Pego, 2019; Pajares et al., 2017; Bhatnagar & Grosse, 2019; Wiechmann et al., 2022; Kohnová et al., 2022; Babkin et al., 2021; Dobos, 2022; Kozarkiewicz, 2020; Gurusamy, Srinivasaraghavan & Adikari, 2016; Marx, Flynn & Kylänen, 2021; Zelfia, Simanungkalit & Raharjo, 2022; Indriasari, Supangkat & Kosala, 2020; Ciampi et al., 2022; Schlömer, 2022 Burchardt & Maisch, 2018; Barbosa & Pego, 2019; Rane & Narvel, 2021; Rachida, Idrissi & Abouabdellah, 2018; Allen, 2019; Marnewick & Marnewick, 2022; Wiechmann et al., 2022; Babkin et al., 2021; Zelfia, Simanungkalit & Raharjo, 2022; Indriasari, Supangkat & Kosala, 2020; Guinan, Parise, & Langowitz, 2019; Dobos, 2022.
•Digital technologies force organizations to become agile •Digital tools make agile project management more efficient •Digital tools and technologies have a positive impact on agile project management •Digital transformation brings great convenience and value to the daily work of enterprises •Digital-agile workplace helps improve job satisfaction •Agile methods require new digital tools and techniques	Technical advantages Evolution	Digital transformation as an enabler of agile project management	Burchardt & Maisch, 2019; Rane & Narvel, 2021; Tyagi et al., 2021; Bhatnagar & Grosse, 2019; Babkin et al., 2021; Kozarkiewicz, 2020; Bhatnagar & Grosse, 2019; Ciampi et al., 2022; Wu, 2022; Lamacchia, Chowdhury & Sharif, 2020; Schlömer, 2022 Rane & Narvel, 2021; Babkin et al., 2021; Bhatnagar & Grosse, 2019; Aasi et al., 2022; Schlömer, 2022

• Agile methods help develop new digital technologies			
• Digital transformation requires stakeholder engagement • Agile focuses on interaction with stakeholders • Iterations can respond to demand in short cycles • Iterations allow for rapid delivery and feedback • Iteration provides customers with higher quality services • Iteration effectively promotes the success of digital transformation • Agile project management teams help break down silo problems • Digital transformation needs to break down silo problems • Agile project management influences team structure • Agile works well for flat organizational structure • Agile project management seeks self-organizing teams • Human mindfulness • Digital transformation requires agile culture • Agile project management emphasizes self-organizing culture • Agile is in demand for company culture	Engage with stakeholders Structural and process adaptation Cultural alignment	Agile project management as a driver of digital transformation	Poeppelbuss, Ebel & Anke, 2021; Barbosa & Pego, 2019; Rachida, Idrissi & Abouabdellah, 2018; Marek et al., 2019; Allen, 2019; Kohnová et al., 2022; Dobos, 2022; Kozarkiewicz, 2020; Wu, 2022; Plattfaut, 2022 Burchardt & Maisch, 2018; Pajares et al., 2017; Allen, 2019; Marnewick & Marnewick, 2022; Babkin et al., 2021; Gurusamy, Srinivasaraghavan & Adikari, 2016; Zelfia, Simanungkalit & Raharjo, 2022; Aasi et al., 2022; Guinan, Parise, & Langowitz, 2019; Wu, 2022; Lamacchia, Chowdhury & Sharif, 2020; Schlömer, 2022; Veroba & Azmi, 2021; Rane & Narvel, 2021; Kozarkiewicz, 2020; Indriasari, Supangkat & Kosala, 2020; Marek et al., 2019; Plattfaut, 2022. Allen, 2019; Marnewick & Marnewick, 2022; Wiechmann et al., 2022; Kohnová et al., 2022; Gurusamy, Srinivasaraghavan & Adikari, 2016; Indriasari, Supangkat & Kosala, 2020; Guinan, Parise, & Langowitz, 2019; Ciampi et al., 2022; Plattfaut, 2022; Lamacchia, Chowdhury & Sharif, 2020; Schlömer, 2022; Dehnert & Santelmann, 2021

According to the results of data, the existing literature describes the relationship between agile project management and digital transformation as unidirectional and bidirectional. This relationship points to the many ways that digital transformation and agile project management function within organizations to facilitate each other's execution. This mainly exists in the following 13 aspects and themes.

5. Data analysis

In this section, we will introduce 9 related topics in the unidirectional and bidirectional relationship between digital transformation and agile project

management. This will be analyzed based on the data we obtained from the original literature pool, trying to understand the cause and effect of digital transformation and agile project management within companies.

5.1 Mutual Development of Agile Project Management & Digital Transformation

The most important relationship between agile project management and digital transformation is mutual promotion, in other words, each acting as a driving force for the other, and these interactions occur in the following aspects.

5.1.1 Support Customer Centric

Previous studies have shown that a user-centric mindset is an important component of ensuring the creation of personalized products, meeting stakeholder needs, and building corporate reputation (Barbosa & Pego, 2019; Rane & Narvel, 2021; Poeppelbuss, Ebel & Anke, 2021; Wiechmann et al., 2022). The role of digital transformation is to provide digital platforms to connect stakeholders to production processes (Phalake & Joshi, 2020), with the goal of responding to customer needs, strengthening daily communication with customers, providing personalization and providing product visibility (Barbosa & Pego, 2019; Rane & Narvel, 2021; Tyagi et al., 2021; Rachida, Idrissi & Abouabdellah, 2018). Agile project management method is more advantageous in discovering and responding to customer needs (Marek et al., 2019; Wiechmann et al., 2022). Considering the principles of agile project management, providing high-quality services within the promised time and creating value for customers are the core goals of the organization (Dobos, 2022; Zelfia, Simanungkalit & Raharjo, 2022; Aasi et al., 2022), and previous case studies have demonstrated that a user-centric mindset is beneficial to product development and value creation (Gurusamy, Srinivasaraghavan & Adikari, 2016).

5.1.2 Agile Strategic Enablement

One of the benefits of digital transformation is that it can make better decisions through business intelligence, which includes artificial intelligence, big data, and machine learning (Marnewick & Marnewick, 2022; Babkin et al., 2021). Leaders can therefore make the right decisions with less time and effort (Rane & Narvel, 2021; Kozarkiewicz, 2020; Ciampi et al., 2022). Cross-functional teams in agile project management have the advantage of self-management. They do not need a single project manager to make decisions, but rather the team formulates strategies through communication (Marnewick & Marnewick, 2022; Dobos, 2022). The decision-making models of digital transformation and agile project management will likely be integrated to improve the accuracy of decisions (Burchardt & Maisch, 2018).

To Conclude, this article proposes three different views on the relationship between digital transformation and agile project management by separating the themes, thus answering our first research question.

5.1.3 Coping with Uncertainty

Due to the volatility and complexity of the market, how organizations deal with uncertainty has become a core topic in strategy formulation (Babkin et al., 2021; Dobos, 2022). The flexibility and adaptability of agile organizations facilitate rapid response to external changes (Wiechmann et al., 2022; Kohnová et al., 2022). To be more specific, agile project management relies on iterative development, frequent delivery, and shorter cycles to facilitate response to demand (Schlömer, 2022; Poeppelbuss, Ebel & Anke, 2021; Pajares et al., 2017; Zelfia, Simanungkalit & Raharjo, 2022). In other words, the customer-centric principle enables agile organizations to discover opportunities and threats in a timely manner and respond calmly (Kohnová et al., 2022; Babkin et al., 2021). On the other hand, digital technologies and capabilities effectively integrate the work processes of enterprises and have a significant effect on combating uncertainty (Marx, Flynn & Kylänen, 2021; Ciampi et al., 2022).

5.1.4 Cross-Functional Collaboration and Communication

In the digital transformation ecosystem, it is very meaningful to establish cross-functional teams (Rachida, Idrissi & Abouabdellah, 2018). Digital technologies have changed the management model of basic business, thus promoting the formation of cross-functional teams, in which team members may work together without being limited by time or location, and they can react to emergencies more quickly (Wiechmann et al., 2022). Agile project management also emphasizes the importance, necessity and advantages of cross-functional services (Schlömer, 2022). On the one hand, cross-functional teams strengthen communication within the organization, reduce unnecessary document flow, and create a favorable environment for collaborative work and shared information platforms (Rane & Narvel, 2021; Allen, 2019; Marnewick & Marnewick, 2022; Babkin et al., 2021). On the other hand, the cross-functional team structure is more conducive to collecting and processing information, such as understanding user needs and seeking to deliver products quickly (Guinan, Parise, & Langowitz, 2019).

On the other side, agile project management and digital transformation both emphasize the necessity and importance of communication. The diversity of digital platforms and tools has enhanced the communication capabilities within the organization and with stakeholders (Schlömer, 2022; Ciampi et al., 2022; Wiechmann et al., 2022; Kozarkiewicz, 2020). At the same time, the Agile Manifesto emphasizes

that frequent communication with customers can improve delivery efficiency and change the way projects are delivered (Kozarkiewicz, 2020; Indriasari, Supangkat & Kosala, 2020).

Digital transformation and agile project management require the support of product managers, especially for those who make decisions (Bhatnagar & Grosse, 2019; Schlömer, 2022) and therefore require organizational leaders to have matching capabilities (Wiechmann et al., 2022; Guinan, Parise, & Langowitz, 2019). Previous literature has suggested the need to adapt leadership to digitalization and agile project management, with specific examples being “servant leadership” (Guinan, Parise, & Langowitz, 2019), “agile leadership” (Burchardt & Maisch, 2018) and “digital leadership” (Wiechmann et al., 2022). These different kinds of leaderships all demonstrate the changes when teams are adopting digital transformation and agile project management.

5.2 Digital transformation as an enabler of agile project management

Digital transformation serves as a key enabler of agile project management by providing essential technological infrastructure, data support, and collaborative capabilities (Lamacchia, Chowdhury & Sharif, 2020; Schlömer, 2022). On the one hand, digital technologies such as cloud computing, big data, and artificial intelligence enhance teams’ ability to perceive market changes, enabling more timely and accurate decision-making. On the other hand, digital platforms break down organizational silos and communication barriers, offering agile teams the foundations for remote collaboration, visualized project management, and rapid feedback. Moreover, digital transformation fosters a shift in organizational culture toward openness, agile project management, and continuous improvement, creating a favorable environment for the implementation and scaling of agile practices. Therefore, digital transformation is not only a context for applying agile project management but also a driving force behind its effective operation and ongoing evolution.

5.2.1 Technical advantages

The support of digital transformation for agile project management mainly comes from the field of technology (Babkin et al., 2021; Kozarkiewicz, 2020; Bhatnagar & Grosse, 2019). Various digital tools and platforms help expand the scope of personnel in agile project management teams and are conducive to implementing the communication skills emphasized by agile culture (Lamacchia, Chowdhury & Sharif, 2020; Schlömer, 2022). Therefore, it is very necessary to sort out how digital transformation promotes the progress of agile project management.

Some past evidence shows that agile project management frameworks need technology (Rane & Narvel, 2021; Babkin et al., 2021; Bhatnagar & Grosse, 2019), especially digital tools and technologies such as artificial intelligence, cloud technology, and big data (Schlömer, 2022). Today, considering the complex working environment, the infrastructure of a large number of companies cannot support the team to carry out agile methods, resulting in incomplete implementation of agile methods and low team efficiency. In this case, organizations must be assisted by the latest digital tools and technologies (Aasi et al., 2022). In addition, considering the advent of the big data era, agile teams also urgently need digital support for project management tools, which is mainly reflected in data analysis, automation, decision analysis and other fields. It can be said that without the support of digital tools, agile project management methods cannot be effectively implemented (Rane & Narvel, 2021; Babkin et al., 2021).

5.2.2 Evolution

Some researchers believe that digital tools have promoted the development of agile project management, such as the application of digital project management (DPM) (Wu, 2022). As Dr. Wu stated, digital transformation is a sign of flexibility in agile project management. To be more specific, agile project management emphasizes teamwork and stakeholder participation, and digital transformation provides excellent tools to assist project managers in making comprehensive plans, so that they can perceive risks and external changes and help agile project management teams cope with changes (Wu, 2022). At the same time, digital tools are consistent with the methodology of agile project management. Digital transformation effectively supports the concept of agile project management, especially the ability to grasp external changes, making agile methods more flexible.

Digital platforms have increased the scope of agile project management teams, such as cross-border communication and exchanges (Aasi et al., 2022; Schlömer, 2022). This was amplified during the epidemic because when workers were restricted to working in an effective space, the digitalization of project management narrowed the scope of each other, reduced the difficulty of communication, and increased the ability of agile project management teams to obtain information and process data (Plattfaut, 2022).

In addition, digital transformation has increased the level of business intelligence, which contributes to providing guidance and decision-making for the team, which may result in a greater possibility of agile project management teams making correct decisions in a short period of time through digital transformation (Lamacchia, Chowdhury & Sharif, 2020; Schlömer, 2022; Veroba & Azmi, 2021). Another benefit

of this is that it reduces the possibility of risk of accidents caused by short-term iterative development.

5.3 Agile Project Management as a Driver of Digital Transformation

In the unidirectional relationship, agile project management has become an important part as a driving force for digital transformation. In addition to benefiting from the project management framework related to agile development topics, other characteristics of agile project management have improved the process of digital transformation and have had a significant impact on the organization.

5.3.1 Agile helps with engaging with stakeholders in digital transformation

Agile project management can effectively integrate stakeholders into the development and management process. On the one hand, agile project management emphasizes the importance of communication (Rachida, Idrissi & Abouabdellah, 2018), and through continuous feedback and iterative development models, customer needs can be completed and fed back in a short period of time. On the other hand, successful project management needs to be user-centric and attach importance to the importance of teamwork and customer collaboration (Kohnová et al., 2022; Dobos, 2022). Agile project management can ensure that stakeholder needs are met and actively respond to external uncertainties through smaller and faster turnarounds while interacting with stakeholders (Wu, 2022; Plattfaut, 2022).

5.3.2 Structural and process adaptation

From the perspective of digital transformation, its purpose is to communicate the company's business with a wider range of stakeholders in the form of a digital platform. The core reason for the long-term high failure rate is the lack of digital execution processes and the lack of the ability to use digital platforms to respond to environmental changes (Saldanha, 2019). The iterative model divides the original product production cycle and replaces it with a repetitive process of multiple short cycles, which helps the production and development teams actively adjust and absorb information from outside the company (Aasi et al., 2022). Whether it is challenges, risks or opportunities, the iterative model provides the possibility for the organization to respond quickly (Wu, 2022). In digital transformation companies, employees often lack response to external information and still operate projects with inherent production thinking.

The inefficiency of digital transformation is sometimes related to a lack of communication within the organization, or the inability to break down traditional organizational silos. Working in silos can have a serious impact on a company's business. They can lead to internal disputes and can cause a lack of trust within the company. This will lead to inefficiencies and redundancies within the department. In

practice, teams stop talking, stop passing feedback, and miscommunication derails projects. Data is the key to maximizing customer experience, and information silo awareness can also seriously reduce customer satisfaction. If teams are not encouraged to share information according to standards, they may not be able to use data effectively (Rane & Narvel, 2021). Therefore, breaking down silos can have a significant impact on the company's ultimate success or failure. The advantage of agile project management lies in the integration of project teams, which emphasizes individuals and interactions over processes and tools (Burchardt & Maisch, 2019). In agile philosophy, project teams, customers, and stakeholders work together repeatedly to discover product requirements and features. Breaking down information silos is an advantage of the agile project management model, which will bring great benefits to the process of digital transformation and internal management of the enterprise (Zelfia, Simanungkalit & Raharjo, 2022).

After reviewing the literature, we believe that agile project management teams have a positive effect on subverting traditional organizational structures and creating new operating models (Dehnert & Santelmann, 2021). The ability of agile project management teams to respond quickly to environmental changes is a required attribute for all organizational changes, including the process of digital transformation (Pajares, et al., 2017). Through the joint learning of leaders and employees, organizations gradually transform from traditional working models to more modern working methods.

Transformational leadership is required in both digital transformation and agile project management (AlNuaimi, 2022; Dehnert & Santelmann, 2021). Transformational leadership is defined as the ability of organizational leaders to make employees aware of the importance of the tasks they undertake through appeal, organizational learning, intellectual stimulation, and personalized care (AlNuaimi, 2022). The purpose is to inspire employees to have a higher level of understanding of the organizational structure so that they can maximize their potentiality (Veischi & Eghbali, 2014; Pirayesh & Pourrezay, 2019). This leadership encourages employees to innovate is relevant to the survival of enterprises in an unstable and unpredictable digital environment (Ferraris et al., 2022; Akkaya & Tabak, 2020).

5.3.3 Cultural alignment

Previous literature has suggested that enterprises need to promote personnel interaction and provide creativity through agile project management when dealing with the current unstable environment. Agile project management teams can achieve flexibility and improve responsiveness to changes. The leadership of agile project management teams and the work of self-organizing teams are based on iterative

development with short work cycles, which helps to build organizational culture based on the theoretical framework of agile project management (Burchardt & Maisch, 2019). Technological innovation has brought great pressure to the survival of enterprises, forcing them to accelerate the pace of transformation and change. Considering that traditional corporate culture is not enough to support employees of enterprises to respond to external uncertainty and complexity, we suggest that agile elements be added to enterprises to combat external challenges (Pajares et al., 2017).

6. Discussion

In today's global business landscape, the convergence of digital transformation and agile project management is no longer merely a technological trend but has become a decisive factor in enhancing organizational resilience, innovation, and competitiveness. Digital transformation entails a holistic upgrade of structures, processes, cultures, and technological systems, while agile project management offers an operational paradigm for navigating uncertainty, facilitating rapid experimentation, and enabling continuous iteration. The synergy between the two not only accelerates enterprise responsiveness in technology deployment but also reshapes strategic decision-making, cultural formation, and resource allocation. Amid global supply chain disruptions, evolving customer expectations, and the rise of platform economies, organizations urgently need to balance complexity and adaptability.

The significance of research in this area is multifaceted. Firstly, existing studies highlight the role of agile project management as a connector and catalyst in achieving digitalization goals (Fitzgerald et al., 2013; Ghasemaghahi & Calic, 2020). Secondly, digital platforms provide sustainability, data-driven support, and cross-regional collaboration capabilities for agile implementation (Guinan et al., 2019; Mendoza et al., 2019). Thirdly, the cultural–structural–technological interplay transforms so-called “digital agile” from a managerial buzzword into an assessable system of organizational capability (Tyagi et al., 2021; Zhao et al., 2020). Hence, this study aims not merely to summarize methods and cases, but to uncover the embedded mechanisms of organizational adaptability, transformation logic, and capability evolution inherent in the interaction between agile project management and digital transformation.

6.1 Technological Pathway

From a technological implementation perspective, agile project management offers an efficient framework to support digital transformation. Digital transformation initiatives often involve the large-scale deployment of emerging technologies such as enterprise-level software systems, cloud platforms, the Internet of Things (IoT), and

artificial intelligence (Babkin et al., 2021). By breaking down complex digital initiatives into manageable increments, agile project management helps reduce the risks associated with technological implementation (Marek et al., 2019). For example, a multinational insurance company adopted agile project management to replace manual, paper-based processes during its digital transformation toward business process automation. This enabled the successful deployment of robotic process automation within short development cycles, resulting in improved operational efficiency and process consistency (Marek et al., 2019). Similarly, Petronas implemented agile iterations in its front-end engineering digitalization project by initially digitalizing data handover and database components, followed by the gradual integration of analytical tools, ultimately leading to the development of a unified analytics platform. This iterative technological approach demonstrates that, compared with traditional waterfall models, agile project management better facilitates the integration of digital technologies, allows timely adjustments, and optimizes system functionality, thereby increasing the likelihood of project success (Veroba & Azmi, 2021).

Digital transformation provides robust technological support for agile project management (Wu, 2022). Digital technologies such as big data and business intelligence enhance the ability of agile teams to make informed decisions and improve the scientific rigor of iteration planning (Marnewick & Marnewick, 2022; Lamacchia et al., 2020). For instance, incorporating real-time data analytics and visual dashboards within agile project environments enables teams to detect risks promptly and adapt plans, accordingly, thus reinforcing the responsiveness of agile project management in dynamic contexts (Plattfaut, 2022). Moreover, the widespread adoption of digital collaboration platforms has expanded the communicative reach of agile teams, facilitating smoother cross-departmental and remote coordination (Aasi et al., 2022). Some studies also note that integrating agile project management with enterprise social media and other digital tools may enhance information-sharing efficiency, although caution is advised regarding potential distractions and reduced employee focus (Nusrat et al., 2021). Overall, digital transformation strengthens the technological foundation for agile project management, accelerating its implementation, while agile approaches, in turn, ensure that digital technologies are deployed with adaptability and flexibility. This mutual reinforcement enables both elements to work synergistically (Marek et al., 2019; Veroba & Azmi, 2021).

6.2 Cultural Mechanism

The success of digital transformation depends not only on technological capabilities but also on the alignment of organizational culture. In this context, agile

project management plays a critical role in driving cultural change. Traditional organizations are often characterized by departmental silos and rigid hierarchies, which are incompatible with the rapid collaboration demanded by digital transformation. The adoption of agile principles encourages a cultural shift toward open communication, empowered trust, and continuous learning (Kohnová et al., 2022). Research indicates that organizations embracing agile practices during digital transformation tend to cultivate transparent and collaborative environments, dismantle hierarchical mindsets, and promote team autonomy in decision-making (Aasi et al., 2022). For instance, a case study of a company undergoing ERP system transformation found that the adoption of agile thinking led to a flatter organizational structure, increased transparency between management and employees, and significantly improved employees' psychological readiness for change. These cultural adjustments helped reduce resistance to digital initiatives (Aasi et al., 2022). Similarly, Indriasari et al. (2020) emphasize that in highly regulated industries, advancing a digitally enabled agile transformation requires reconfiguring governance structures and relational mechanisms—such as establishing cross-functional communication channels and fostering a culture of trust—to enable agile team operations.

Cross-cultural adaptability is another crucial dimension of the cultural mechanism when integrating digital transformation with agile project management. In a globalized context, digital initiatives often involve multinational teams and multicultural user markets. Agile project management emphasizes face-to-face communication and team cohesion, which necessitates adaptive strategies in cross-cultural environments (Rachida et al., 2018). Studies have shown that digital collaboration platforms can mitigate communication barriers arising from cultural differences. By leveraging online collaboration tools, team members can engage in frequent, boundary-spanning interactions across geographic and cultural divides (Aasi et al., 2022; Schlömer, 2022). For example, during the COVID-19 pandemic, multinational companies continued advancing projects through agile development and remote collaboration, demonstrating the cross-cultural resilience of agile methodologies (Plattfaut, 2022). However, agile practices may be interpreted or implemented differently depending on national and regional contexts, such as variations in decision-making styles or perceptions of time, which require careful coordination in setting team norms. Furthermore, digital transformation efforts in state-owned enterprises or government agencies must account for local cultural values and administrative traditions, rather than applying agile methods in a prescriptive or uniform manner (Zelfia et al., 2022). Therefore, when executing digitally enabled agile transformations in cross-cultural contexts, managers must balance universal

agile principles with local cultural sensibilities to foster an open and inclusive organizational culture that supports meaningful change (Indriasari et al., 2020; Rachida et al., 2018).

6.3 Cognitive Evolution

The integration of agile project management with digital transformation has triggered an evolution in organizational cognition, particularly reflected in the shifting mindsets of both managers and employees.

First, the cognitive framing and role definition of leadership must be reconfigured. In traditional project environments, managers are typically positioned as the central agents of planning and control. However, in digitally driven agile contexts, leaders are increasingly expected to act as coaches and facilitators (Chowdhury & Lamacchia, 2020). For example, research has shown that project managers undergoing agile transformation transition from being “commanders” to “servant leaders”, enhancing team innovation by empowering members rather than directing them (Guinan et al., 2019). Similarly, a study by Indriasari et al. (2020) on large Indonesian enterprises revealed that IT executives must shift from a reactive support mentality to a proactive, collaborative stance with business partners in order to meet the demands of rapid digital change. This cognitive shift in leadership fosters a supportive organizational environment and reduces internal resistance, thereby facilitating the implementation of agile project management methodologies.

Second, employee cognition and learning patterns are also evolving in response to digital transformation. Agile project management emphasizes continuous learning and regular reflection, aligning well with the fast-paced iteration cycles of digital technologies (Poeppelbuss et al., 2021). Within agile project management, teams conduct sprint retrospectives to extract lessons and adapt their behaviors accordingly, which cultivates enhanced learning agility and adaptability (Schlömer, 2022). This is particularly critical for digital transformation, where the adoption of new tools and data-driven decision-making necessitates that employees possess both the willingness and capability to continually update their knowledge base (Babkin et al., 2021). Integrating design thinking into agile teams can broaden employees’ user perspectives, counteract cognitive biases, and stimulate more creative problem-solving (Guinan et al., 2019). For instance, in a case involving a medical device company, agile teams developing digital health applications utilized role-playing and rapid prototyping to break entrenched mental models, significantly improving product innovation. These examples illustrate how agile project management fosters a cognitive shift among employees, from relying on established experience to embracing change and engaging in proactive learning. Such cognitive evolution enables organizations to capitalize

more effectively on the opportunities presented by digital technologies and to maintain agile responsiveness amid uncertainty (Millar et al., 2018).

6.4 Contextual Differences Across Industries and Organizational Scales

The integration of agile project management and digital transformation exhibits significant variation across different industries and organizational sizes, necessitating context-specific adaptations. Large enterprises often operate with complex legacy systems and rigid hierarchical structures, which can pose substantial challenges to the implementation of digitally enabled agile transformation (Verhoef et al., 2021). For instance, in highly regulated sectors such as traditional banking or telecommunications, process rigidity and compliance requirements may require agile practices to be adapted—such as extending iteration cycles to accommodate compliance reviews (Indriasari et al., 2020). In contrast, small and medium-sized enterprises (SMEs) generally benefit from flatter organizational structures and shorter decision-making chains, making them more amenable to adopting an agile culture across the organization (Wiechmann et al., 2022). Empirical evidence suggests that medium-sized firms are able to respond more quickly to market opportunities and maintain competitiveness by leveraging agile management during digital transformation (Wiechmann et al., 2022). For example, a qualitative study in Germany found that medium-sized manufacturing firms employed agile practices to reduce supply chain response times and better meet fast-changing customer demands, thus sustaining competitive advantage in the face of digital disruption (Wiechmann et al., 2022).

Moreover, in startups focused on hardware and software development, agile and digital principles are often embedded from the outset. These organizations typically prioritize rapid product iteration and user experience, with minimal internal inertia to resist change (Dobos, 2022). Conversely, in public sector organizations or traditional manufacturing industries, the scale and complexity of operations necessitate a dual-track approach to agile transformation, combining both bottom-up and top-down strategies. This includes piloting agile projects at the team level while simultaneously advancing digital strategic visions from senior leadership (Zelfia et al., 2022).

Cross-case studies further reveal that industry-specific attributes influence the priorities of agile digital transformation. For example, manufacturing sectors focus on supply chain agility and operational efficiency, whereas the financial sector emphasizes data-driven decision-making and customer experience (Nandi et al., 2020). Therefore, organizations must assess their specific industry and structural characteristics when designing agile transformation roadmaps, determining the appropriate level of adoption and implementation pace. In high-risk industries such as

life sciences, the introduction of agile practices must be carefully balanced with strict quality and safety controls. By contrast, internet-based firms may benefit from adopting bold fail-fast strategies (Moi & Cabiddu, 2020). In summary, organizations across diverse industries and scales should pursue differentiated strategies when integrating agile project management with digital transformation, balancing universal principles with context-specific needs (Indriasari et al., 2020; Wiechmann et al., 2022).

In summary, the integration of agile project management and digital transformation has driven the evolution of organizational capabilities and enhanced firms' adaptability to changes in the external ecosystem. Through agile methodologies, organizations become more flexible and open, fostering capabilities for rapid learning and iterative innovation. This evolution of organizational capability is reflected in several ways: firms develop a heightened sensitivity to market signals and can promptly adjust their strategies (Nadkarni & Prügl, 2021); internal functions become interconnected through collaborative networks capable of autonomous problem-solving (Aasi et al., 2022); and employees demonstrate improved digital literacy and adaptability, enabling them to master emerging technologies and continuously innovate (Spoladore & Pessot, 2022).

The mutual reinforcement between agile project management and digital transformation results in a "bimodal" capability structure, combining the control and stability required for routine operations with the flexibility and dynamism necessary for exploration and innovation (Muduli, 2013). Such capabilities allow organizations to survive and thrive in rapidly evolving digital ecosystems. Companies with high levels of digital maturity and organizational agility demonstrated greater resilience during disruptive events. These firms were able to swiftly transition operations online, adjust supply chain strategies, and maintain business continuity under volatile conditions (Nandi et al., 2020).

7. Future Direction

In light of evolving digital environments and intensifying organizational complexity, the integration of agile project management and digital transformation has garnered significant scholarly interest. However, despite burgeoning literature, many theoretical and empirical gaps remain underexplored. This section identifies promising future research directions that simultaneously engage both agile project management and digital transformation.

7.1 Co-evolution of Agile Project management and Digital Transformation

7.1.1 Comparative Research on Integration Pathways across Industries and Organizational Contexts

Research should explore the divergent integration pathways of agile project management and digital transformation across industries, organizational scales, and cultural backgrounds. Large enterprises often face structural rigidity and legacy system constraints, whereas SMEs benefit from flatter structures and shorter decision chains, making agile adoption more feasible. Existing literature primarily emphasizes agile-digital integration in large organizations (Zaki, 2020), while low-cost agile strategies and lightweight digital platforms in SME contexts remain underexplored. Moreover, each industry presents unique priorities: manufacturing emphasizes supply chain responsiveness (Ghobakhloo, 2020), while finance focuses on enhancing customer experience through digital services. Future studies should develop cross-sector comparative models to understand how industrial logic shapes agile-digital value creation. Additionally, under cross-cultural conditions, organizational culture and institutional logic significantly influence agile project management and digital transformation integration. In high-power distance cultures, balancing autonomy with hierarchy and contextualizing agile practices warrants deeper investigation. Comparative cultural frameworks can help elucidate how national culture moderates the performance of agile-digital integration (Clohessy et al., 2019; Sambamurthy et al., 2003).

7.1.2 Constructing Integrated Performance Evaluation Frameworks

There is a need to establish unified performance metrics to evaluate agile project management and digital transformation implementation. Agile project management success is typically measured by delivery speed and adaptability, while digital transformation success emphasizes strategic impact—currently lacking convergence. Future research should propose multidimensional evaluation frameworks incorporating financial performance, operational efficiency, customer satisfaction, and innovation capacity to holistically assess agile-digital transformation performance (Ciampi et al., 2022; Kaplan & Norton, 1996). Such frameworks will support comparative empirical studies and practical evaluation.

7.1.3 Theoretical Enrichment through Interdisciplinary Perspectives

Theoretical models of agile project management and digital transformation co-evolution remain underdeveloped. Future studies should integrate perspectives from complexity theory, institutional theory, and cognitive science to unpack mechanisms of organizational adaptation under dual pressures. For example, complex adaptive systems theory can explain how agile practices and digital technologies co-shape

dynamic capabilities, while managerial cognition may help interpret how leaders perceive and respond to transformation pressures (Teece et al., 2016; Beck & Wiersema, 2013). Cross-disciplinary theory building will contribute to establishing robust conceptual foundations for agile-digital synergy.

7.2 Digital Transformation as an Enabler of Agile Project Management

7.2.1 Digital Platforms and the Reconfiguration of Agile Team Mechanisms

Digital transformation provides essential technological infrastructure and data empowerment for agile management. Studies should investigate how modular platform architectures and system integration capabilities support scalability and coordination in agile practices. Research may explore how digital platforms (e.g., cloud services, DevOps toolchains) reshape CI/CD pipelines and introduce novel agile implementation patterns. Such inquiries are currently lacking theoretical depth and require empirical validation (Mendoza et al., 2019; Tyagi et al., 2021; Schlömer, 2022).

7.2.2 Data Transparency and Information Sharing for Decision-Making

The role of data transparency and interdepartmental information sharing in enabling agile decision-making deserves greater focus. Despite the availability of analytical tools, integrating them effectively into agile workflows remains ambiguous. Future research should examine how digital technologies dismantle organizational silos, enhance collaborative data access, and influence team autonomy and decision timeliness (Zelfia et al., 2022; Rane & Narvel, 2021). Case-based and longitudinal designs can reveal mechanisms of data-enabled agile governance.

7.2.3 Emerging Technologies Reshaping Agile Paradigms

Emerging technologies such as AI, blockchain, and IoT are redefining agile project paradigms. For instance, AI-driven analytics can enhance sprint planning, while smart contracts may facilitate trust-based collaboration. Future research should explore both how such technologies empower agile teams and how they reshape agile methodologies. Key areas include role evolution, cadence shifts, and distributed coordination (Babkin et al., 2021; Dobos, 2022). Mixed-method studies can offer insight into best practices and inform digital capability strategies for agile transformation (Spohrer & Welser, 2020).

7.3 Agile Project Management as a Driver of Digital Transformation

7.3.1 Cultural Enablement through Agile-Led Organizational Change

Research should address how agile practices promote the cultural shift needed for digital transformation. Agile project management rituals such as sprints, reviews, and retrospectives serve as micro-mechanisms for cultural embedding, promoting

transparency, collaboration, and user-centricity. Longitudinal case studies can track how agile rituals gradually reshape cultural norms and examine whether such effects are amplified or dampened in digital contexts (Rigby et al., 2020; Pajares et al., 2017). For instance, in traditionally bureaucratic firms, the introduction of agile teams may enhance internal communication, innovation tolerance, and change receptivity.

7.3.2 Leadership Paradigm Shifts in Agile-Digital Contexts

Leadership transformation is critical in agile-digital transitions. The shift from directive to empowering leadership styles, such as servant, agile, or digital leadership, reflects the managerial adaptation required for transformation. Research should explore how digital tools mediate leadership behavior and how leadership style influences agile team performance (AlNuaimi et al., 2022; Ferraris et al., 2022). For example, empirical studies could assess the effects of collaborative tools and dashboards on decision transparency and team autonomy. Furthermore, researchers should evaluate whether participative leadership enhances innovation and transformation engagement under agile and digital pressures (Guinan et al., 2019; Wiechmann et al., 2022).

7.3.3 Agile Project Management-Driven Process and Structural Reconfiguration

Studies should explore how agile methods reshape digital transformation execution through organizational process and structural redesign. Iteration models in agile project management enable faster adaptation and shorter feedback loops, potentially reducing transformation risk (Aasi et al., 2022; Wu, 2022). Quantitative comparisons between agile project management and waterfall-based digital transformation projects can highlight differences in delivery outcomes. Moreover, agile's emphasis on cross-functional collaboration and transparent communication may mitigate silo effects and enhance coordination (Dehnert & Santelmann, 2021; Zelfia et al., 2022). Research should measure shifts in intra-organizational communication density and cross-departmental network structures following agile adoption, and assess how these shifts support digital transformation objectives.

To conclude, the intersection of agile project management and digital transformation represents a fertile research frontier. Future studies should move beyond method optimization toward understanding the systemic interdependencies among technology, structure, cognition, and culture. This requires longitudinal, cross-industry, and multi-level research designs capable of capturing emergent capability clusters that sustain organizational resilience and innovation in a volatile digital ecosystem (Vial, 2019; AlNuaimi et al., 2022; Ciampi et al., 2022).

8. Contributions

This paper presents a systematic literature review on the concepts of agile project management and digital Transformation, a systematic literature review of existing articles using the PRISMA guiding framework, and an attempt to qualitatively analyze the relationship between agile project management and digital transformation. It tries to prove that agile project management has a positive effect on digital transformation in terms of operation models, organizational approaches, leadership, company culture, etc., which reduces the failure rate of digital transformation and improves the customer satisfaction of the company. At the same time, this paper objectively expresses the possibility of digital transformation for the sustainable development of agile project management through the interpretation of digital platforms and digital tools.

9. Conclusion

The role of agile project management and digital transformation within organizations is mutual and positive. In this context, digitally transformed organizations should consider Agile project management as the main theoretical guide and framework when executing projects. Agile project management is facilitative to the process of digital transformation, thus helping those confused business leaders to get rid of the bias in digital transformation. On the other hand, tools and platforms for digital transformation extend the scope of agile project management and are supportive to the decision making of agile project management teams. This query provides a systematic literature review of a total of 33 papers on related research issues, identified from a standardized literature search of two databases, and qualitatively analyses the relationship between agile project management and digital transformation through a structured review. Overall, agile project management is recognized as an enabler in digital transformation, and we identify relevant practices, theories and possibilities for future development based on research that already exists. In this paper, we wish to analyze the impact of agile project management on the organizational structure of digital transformation in order to contribute to the success of digital transformation.

The thesis of this paper has limitations. Only Scopus and Web of Science were used as our databases in this paper; other databases may have more publications waiting to be analyzed. Therefore, future researchers may consider looking at this topic from a broader perspective. Meanwhile, only papers published in journals and academic conferences were selected for this paper, and no evaluation was made for any other form of published ideas and discourses. Thus, the limitation of subjectivity

in data collection and analysis is inherent in a systematic literature review. Other researchers may have obtained different combinations of findings based on similar data. Furthermore, considering that agile project management and digital transformation are still in the developmental stage, more research findings will emerge while this paper is being written, and these ongoing publications should be taken into account in future research.

For future development topics, the theoretical frameworks of agile project management and digital transformation still need to be investigated and more phenomenological or grounded theoretical research is needed to support the possibility of the two co-existing. The review suggests that scholars need to further investigate the theoretical frameworks of agile project management and digital transformation.

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Appendix

Appendix 1 The checklist of the PRISMA

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Page 1
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Page 1
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Page 5
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Page 6
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Page 11
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Page 12
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Page 12
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Page 13
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Page 14
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Page 14
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Page 14
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	Page 12

Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	None
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	None
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	None
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	None
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	None
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	None
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	None
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	None
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	None
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Page 11
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Page 12
Study characteristics	17	Cite each included study and present its characteristics.	Page 14
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	None
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	None
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	None
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	None
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	None

	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	None
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	None
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	None
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Page 24
	23b	Discuss any limitations of the evidence included in the review.	Page 25
	23c	Discuss any limitations of the review processes used.	Page 26
	23d	Discuss implications of the results for practice, policy, and future research.	Page 27
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	None
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	None
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	None
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	None
Competing interests	26	Declare any competing interests of review authors.	None
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	None

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71. doi: 10.1136/bmj.n71