

Developing a new framework on firm digitalization and firm performance: the role of enterprise risk management

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Abstract

The study introduces and scientifically tests a new model concerning the linkage of Digital Transformation to Firm Performance that includes Enterprise Risk Management (ERM) and Innovation Capability as primary drivers, and Organizational Agility as a mediating mechanism. Guided by the Resource-Based View and Dynamic Capabilities Theory, the study addresses the integrated impact of digital and risk-oriented strategies on the outcomes of organizations in Jordan. The study sample comprised 203 respondents from various industries, and the proposed model was analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The findings indicate that digital transformation, ERM, and innovation capability have a strong impact on organizational agility, which in turn, positively affects firm performance. Moreover, innovation capability and agility are amplifier moderators and mediator enhancers of the performance outcomes from digital investments. This study enhances the theoretical ideas of integrating digital transformation and risk as well as providing managerial recommendations to improve competitiveness, agility, and sustainable engagement by firms through managed strategic digitalization.

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Keywords: Digital transformation, Enterprise risk management, Innovation capability, Organizational agility, Firm performance

1. Introduction

During the advanced industrial transformation period, the 4.0 shift has turned organizational digital transformation into a prerequisite for competitiveness and survival [1]. In the case of Jordan's digital economy, pioneering transformations can be seen in the banking industry, in logistics, and higher education [2], [3]. Corporations across the various industry sectors have begun to fully embrace and adopt digital technologies to increase operational and strategic completeness and originality, as well as effectiveness and effectiveness. The application of digital technologies, sophisticated data analysis, and the tools of integration and operational automation have massively transformed ever business architecture, as well as the way businesses and their stakeholders create and retain value [4], [5].

There is no doubt that the digital economy has and continues to offer innovative value-adding opportunities, but equally accepts and presents new unique types of risk, uncertainty, and organizational complexity [6]. These seemingly opposing and contextual factors, focusing on the dual value proposition of trans-boundary digital transformation, requires an in-depth analytical and strategic focus on the way any given market performance and business strategy can tightly lean towards optimal achieving [7]. This is particularly, but not exhaustively, true in any context where performance is sought in high growth, value-adding, fast changing, regulatory burden, and technology dense market [8].

In modern context, one of the critical approaches that we designated for the period of digitalization is Enterprise Risk Management (ERM). ERM assists in formulating a matrix capturing risks critical for the achievement of set strategic goals, and offers methods for the assessment and mitigation of such risks [9]. Basic risk management practices tend to optimize their processes and operate in 'silos'. Unlike this, ERM enables the communication of risk information across the whole entity [10]. In the current digitalized world, firms operate in a complex and interconnected business environment, and their ability to predict and respond to compliance issues is no longer the sole focus of ERM. It is a source of competitive advantage supporting pro-active management of change and performance protection. Recent evidence confirms that the competitive advantage is enhanced by the adoption of sophisticated ERM frameworks [11].

The effect of digitization and ERM integration on a firm's success is still in the works even after the emphasis each of the two received in the research is unsettling. This stubble inconsistency varies across gaps in the sector and the ever-changing condition of a digital economy [12]. Although several studies support the assumption that the outcome of digital transformation on a firm's success is affirmative through innovation and high process throughput, others argue the outcome may disproportionately depend on the enabling organization factors that are present, and the firm is able to successfully managed risks and remain agile [13]. Digital initiatives, in most cases, do not achieve their anticipated outcomes. The most common causes are catastrophic risk governance concerning data and facts, data privacy, and the lack of either enabling or incapacity constrained risk cultures. Thus, the question of how ERM interacts with digital transformation to enhance firm performance is a question with a definable theoretical contribution and practical urgency [14], [15].

In addition, the ability to innovate is yet another important driver of performance in the digital age. Companies that have a high capability for innovation are abler to exploit digital technologies, streamline processes, and create new offerings in the market [16]. A case in point is the case of regional banks in Jordan and the Gulf that are redesigning products to meet mobile first customer needs. However, innovation, in itself, is fraught with risk and uncertainty, and increasing the need for integrated risk management systems. ERM, on the other hand, not only supports innovation by exposure to possible threats, but above all, increases the firm's ability to use trial and error in innovation [17], [18]. The relation between the three elements: digitalization, change-oriented ERM, and innovation capability represents a triad that is key for sustaining the performance and competitiveness of the firm.

From a mechanistic view, these specific relationships are illuminated through the concept of organizational agility. This is the 'focal firm' aspect covered in the literature, which focuses on a firm's ability to scan its environment, make decisive choices, and reorganize its resource portfolio in a timely manner. In a digital context, agility is the missing link between what technology makes possible and what is achieved. With Digital transformation, the flow of information is enhanced and transparency demanded and the ability provided by ERM for disciplined risk taking are the critical ingredients that together enable agile responses to exogenous shocks. If needed, make subdivision for each section as follows. Many technologically advanced firms are also technologically stagnant because they are rigid in their approaches to investing in technology. In this sense, agility explains the impact of digital transformation, ERM, and innovation on performance. When it comes to developing digital transformation and firm performance, there is a lot of information but it is all over the place in three major areas. To begin with, the digital transformation and enterprise risk management separation hinges on the way the risk governance intersects with the digital value. The second concern is that there is too much of

a concern that the innovative capacities of a firm is an important factor in the performance of a firm. There needs to be an alignment in the organizational mechanisms, i.e., the systems, to have the innovation be effective. The third and final point is that there are still a lot of emerging markets that are very initial in the digital transformation, enterprise risk management, and innovative capacities in the performance of firms. The managers have no choice to operate without an integrated systems approach. The digital transformation, enterprise risk management, and innovative systems have a direct effect on the performance of a firm. There is a considerable loss of organizational agility in that the firm performance is decreasing. This is the primary point of the paper.

In nature this research constructs an innovative setup which connects digital transformation with enterprise risk management, innovation and organizational agility to agility and interlinks them to organizational performance. Multiple aspects of the proposed framework enrich the literature. Firstly, the framework helps to close the boundary of digitalized risk management which, up until this point, has focused on technology adoption and the management of stability and control systems. The model encompasses the protective and dynamic aspects of organizational performance. Secondly, organizational agility has been positioned on the framework as a mediating variable which accentuates its importance as an operational mechanism that allows organizations to convert inputs to substantial strategic outcomes. Thirdly, the framework adds to the dynamic capabilities and resource-based theories by asserting that digital transformation, ERM and innovation capability serve as interrelated dynamic resources with prescribed agility needed for value attainment. From a practical perspective, the framework sets out a practical guide for management with the aim of maximizing performance of a firm operating in uncertain digital surroundings. It highlights the need to integrate ERM within the digital transformation framework rather than doling out risk management as a subsidiary compliance activity. The organizational alignment of innovation and risk governance within an agile framework enhances firm agility and resilience, which is essential for the performance in turbulent markets.

To answer the question as to how to address the interaction between digital transformation, enterprise risk management, and innovation capability and how is each correlated to firm performance along with the organizational agility, is a question every organization should have a clear answer to. As such, the rationale for the study hinges on multi-theoretical synthesis to enable value-oriented, actionable take-aways for designing governance and innovation ecosystems. The research aims to address a gap regarding organizational agility relating to digital transformation, enterprise risk management, innovation capabilities, and performance in firm strategic management. Accordingly, this study is guided by the following research questions:
RQ1: How does digital transformation influence firm performance in Jordanian organizations?
RQ2: What role does enterprise risk management play in enhancing firm performance in digitally transforming firms?
RQ3: How does innovation capability contribute to firm performance through organizational agility?
RQ4: Does organizational agility mediate the relationship between digital transformation, enterprise risk management, innovation capability, and firm performance?

2. Theoretical background

The Resource-Based View (RBV) assigns firm performance to a firm's unique resources and capabilities which are classified as valuable, rare, inimitable, and non-substituted [19]. In digital contexts, asset, resources as data analytics, digital systems, and enterprise risk management (ERM) are recognized as strategic resources which improves effectiveness and promotes innovation [20]. ERM helps in the digital initiative alignment with performance goals by managing uncertainty and strategic asset protection. The Dynamic Capabilities Theory stretches on the RBV by focusing on the firm's ability to sense, seize, and transform in relation to change in the environment [21]. ERM and innovation capability are dynamic capabilities which assist firms to change in the face of digital disruption and retain competitive advantage. Also, Organizational Agility is a mediating capability which translates digital transformation and ERM to outcomes that matter [22]. Agility as a business process improves performance by ensuring strategic responses to uncertainty and opportunity linked with

technology. In conjunction, the RBV, Dynamic Capabilities and Agility frameworks give a multi-perspective approach to explain the role of digital transformation, ERM, and innovation capability on firm performance. The selection of digital transformation, enterprise risk management, and innovation capability as core explanatory variables is grounded in both theory and practice. From a resource-based view, digital technologies and innovation capability represent strategic resources that enable firms to create value, while enterprise risk management serves as a governance capability that protects and enhances these resources under uncertainty. From a dynamic capabilities perspective, these constructs collectively enable firms to sense opportunities, seize them through innovation, and reconfigure resources in response to environmental change. Organizational agility is therefore positioned as the operational capability that translates these strategic inputs into superior firm performance. This theoretical alignment justifies the inclusion and integration of these variables within a single explanatory framework.

3. Research model and hypotheses

Considering the gaps in the previous studies, this work presents a research model (see Figure 1) which asserts that Digital Transformation, Enterprise Risk Management, Innovation Capability Influence Firm Performance significantly and that Organizational Agility is pivotal in transforming these strategies into results. The model further elaborates that while Digital Transformation and Innovation Capability positively influence the performance of a firm on the condition that a firm is sufficiently agile enough to sense and respond to environmental changes, their influence on performance is far from maximized. Likewise, Enterprise Risk Management is also said to enhance this linkage by supporting effective, structured decision making and innovation that is savvy to risk. The next section of the work elaborates on this model and the accompanying hypotheses which the model aims to explain.

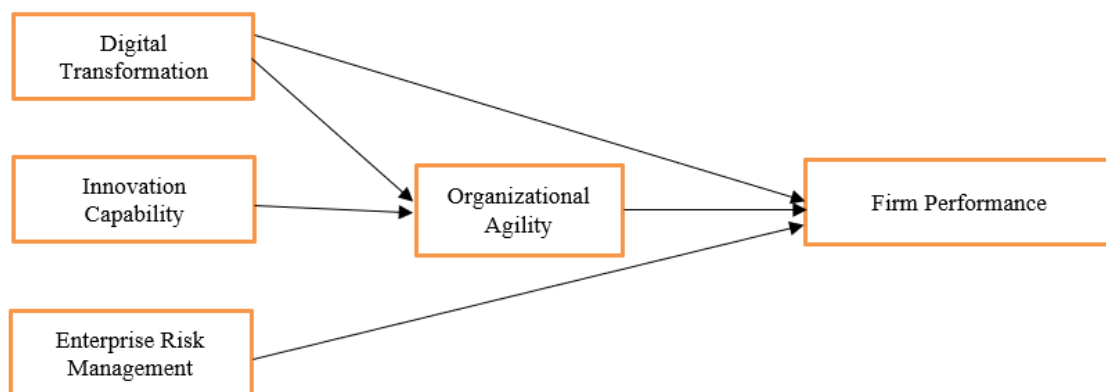


Figure 1. Research model

Source: Authors own creation

3.1 Digital transformation and firm performance

Over the years, digital transformation has blazed its trails over the world, strategic with its use of digital automation, advanced analytics, artificial intelligence, and digital transformation technology to digitally compete, redefine businesses and cross industry boundaries [23]. This shift has fundamentally changed the world of business. Many industry experts posit that digital practices and tools have fundamentally changed the core foundation of competition in business [24]. These experts claim that digital transformation improves the core foundation of business competition, leverages business performance on digital domains, accelerates business innovation, and enhances decision making outcomes [25].

Companies that adopt digital transformation do so with the purpose of improving performance and operational agility. This allows the company to cut down on unproductive activities, foster improvement and operational agility and cut on operational costs [26]. Digital transformation does not just have operational advantages, but fosters the innovation of new and advanced products and services due to the ease of rapid prototyping, testing and deployment [27]. It also enhances the strategic management of the firm by providing greater clarity and

direction thanks to the more effective decision making that comes with the ability to gather, process and analyze massive data volumes.

The literature suggests that the relationship between digital transformation and firm performance is not uniformly established and acknowledges how such discrepancies depend on situational elements such as the solidness of the leadership behind the transformation, the prevailing organizational culture, and the employees' digital skill sets [28]. Companies that do not have a rational digital approach and the requisite risk oversight components usually struggle with a plethora of implementation bottlenecks, resulting in sub-optimal performance from such digital investments [29]. Therefore, seamless adoption of technology is no longer sufficient in achieving successful digital transformation; organizational preparedness, learning agility, and supple management is necessitated as well. Therefore, we propose:

H1: Digital Transformation significantly impacts Firm Performance

3.2 Enterprise risk and management firm performance

Leading up to the completion of organizational goals, Enterprise Risk Management (ERM) was devised to strategically assess and resolve uncertainties that may arise [30]. It aims further than conventional risk management by creating a driven operational and integrated rationale by which risk is managed at all organizational industry levels. The Branch of risk management literature suggests that domino and long-term value is increased due to ERM driven firm performance [31]. While sERMs are recognized by operational and decision-making profit, a multitude of research suggests comprehensive Domains are deemed favorable at an implementation level due to the proofing deaccessioning and fiscal functions sERMs manage [32], [33]. Furthermore, disruptive IT base regulates non-functional area dollars-based condition of fiscal non-regulatory asset funds profitless control. Instruments of strategy alignment and organizational architecture are conjoined by scholar's reference to firm performance [34]. Cognizant firms of risk culture MOE and legal are tapped, as ERM. Overall firm republic policies profits PO increased by financial and non-financial outcome control realization. Track and free fraud monitored ERM process, stake and revalue on base profitless non-financial [35].

The existing body of literature, in summary, asserts that the function of Enterprise Risk Management should not be limited to the maintenance of an organization's status quo, because it has the potential to drive enduring value as a result of its positive correlation to global competition [36], [37]. Businesses that embrace Enterprise Risk Management principles, as underscored in the literature, will have more than just compliance and mitigation. Risk will instead be an opportunity that generates a competitive advantage in the organization's favor, thereby enabling the organization to achieve stability, adaptability, and growth, even in the most volatile conditions [38]. Therefore, we propose:

H2: Enterprise Risk significantly impacts Firm Performance

3.3 Innovation capability, organizational agility and firm performance

A firm's capacity to generate new ideas, absorb them, and then implement them is what determines their level of innovation capability [39]. Such a firm's innovation capability acts a competitive advantage and determines its performance in the long run especially during constant disruptions and uncertainty. Such firms possess the ability to convert technological potential into tangible value [40]. This is done by constant alteration to the existing technological framework to meet market demands and fully utilize available opportunities. This leads to improved firm efficiency, organizational growth, and improved responsiveness to market changes which fuels the firm's growth. The relationship between innovation capability and firm performance is not linear [41]. While firms that invest in innovation tend to outperform their competition, the ultimate benefits of innovation are only possible with agility. This is achieved by translation of creative ideas to pragmatic actions. Innovation then is put agility in motion [42]. This is done partially by a firm's capability to quickly reconfigure their strategy to meet changes in external factors. This especially happens with internal resources that are reconfigured to

optimized opportunities [43]. Having organizational agility makes sure that the outcomes of the strategic and market innovative objectives are aligned with the objectives [44]. It minimizes the delays in execution, broadens collaboration across different functions, and acknowledges the timely scaling of innovations that succeed.

With the use of agility, a firm's sustained improvements in their capabilities of innovation are then achieved, translating to improved productivity, customer satisfaction, and flexibility [45]. In the innovation-made literature, organizational agility in the capability of innovation has been proven to enhance the competitive tier. Agility gives structure to how innovation centered actions are not treated in silos, but a set of actions integrated to elevate the firm's performance enduring a fluid and uncertain market [46]. Empirical studies consistently demonstrate that innovation capability positively influences firm performance by enabling firms to commercialize new ideas, adapt to environmental turbulence, and enhance value creation [10]. However, these benefits are often contingent on the firm's ability to rapidly deploy and scale innovations, reinforcing the role of organizational agility as a critical enabling mechanism. Therefore, we propose:

H3: Organizational Agility significantly moderates the relationship between Innovation Capability and Firm Performance

3.4 Digital transformation, organizational agility and firm performance

The integration of technology has transformed the workflows, ways of competition, and value delivery of most organizations. It is more than just the addition of technology, but rather profound shifts of the organization towards a more flexible, connected, and organizational learning model [47]. Performance is driven by digital transformation through improved operational efficiency, the ease of flow of information, and the effectiveness of decision making. In spite of the benefits technology has brought, several organizations still lack the capability to translate digital investments into tangible benefits [48]. This lack of coherence is an indication that technology is not the only the performance determining factor is the organization's capability to adjust and respond appropriately to shifts in technology and the market [26]. The essence of organizational agility serves as the focal point. The sustaining link between digital transformation and organizational performance. Agility is the organizational ability to identify and understand shifts within the surrounding environment, and respond through making effective decisions, while reevaluating the aligned structures and resources to realign [15]. Highly digitalized organizations do collect and analyze huge volumes of data and information. In as much as rapid insight transformation into action is aided, the agility of the organization is a determining factor. With agility, the scope of digital transformation shifts from the mere adoption of technology to a more holistic perspective that focuses on perpetual transformation, renewal, and adaptability in order to attain competitive advantage [49].

Companies that have a strong digital setup but still lacking in agility tend to experience inertia and fail to realize the full potential of technology. This is very different from having a disconnected digital transformation [50]. When a digital transformation is extra complemented by high organizational agility, the firm is able to pivot, innovate, and capture market opportunities in a more efficient and precise manner. This is all done in part, due to the capability to quickly reconfigured resources [51]. As such, the mediating role of digital agility in organizational performance is to transform phenomenal data driven insights into actionable and driven proactive solutions. This is done by promoting the use of purposeful high velocity innovation that is framed by the 'innovation and execution' gap that is very common in business [52]. This is how the agility protects a sustained competitive advantage that the firm digital transforming does, not on the short term but on the long term [53]. Therefore, we propose:

H4: Organizational Agility significantly moderates the relationship between Digital Transformation and Firm Performance.

4. Research methodology

4.1 Sampling and data collection

A purposive sampling approach was employed to select participants with direct involvement in digital transformation, enterprise risk management, innovation, and performance-related decision-making. Organizations were identified based on their engagement in digital initiatives, and participants were selected according to predefined criteria, including managerial responsibility, involvement in strategic or operational decision-making, and familiarity with digital and risk management practices. This approach ensured that respondents possessed the necessary knowledge and experience to provide informed assessments of the study constructs.

After the first exchange of contact and the phone calls, 27 organizations of different types of businesses had agreed to take part in the research. Each organization was sent an electronic version of the structured questionnaire in the form of an online document or an electronic form. After screening and validating the responses, 203 responses were obtained and included in the finalized dataset. In total, approximately 240 questionnaires were distributed across the participating organizations, yielding 203 usable responses and a response rate of approximately 85%. Responses with substantial missing data or patterned answers were excluded during the data screening process. The final dataset contained no significant missing values, and therefore no imputation techniques were required. This sample size is considered adequate for the application of structural equation modeling (SEM), which allows for the estimation of the predicted relations and hypothesis of the research to measure the extent of the findings generalizable to the business environment in Jordan. Table 1 provides the respondents' demographic profile which confirms the age, sex, educational background, and years of working experience giving more value to the representation of the sample for the study.

Table 1. Participants' information

Sample characteristics	Respondents	%
Age		
< 30 years	29	14
30–45 years	103	51
> 45 years	71	35
Gender		
Male	124	61
Female	79	39
Education		
Diploma or less	33	16
Bachelor's degree	113	56
Postgraduate degree	57	28
Experience (Years)		
< 10 years	38	19
10–20 years	119	59
> 20 years	46	22
Total	203	100

Common method bias (CMB) issues were analyzed utilizing [54] methodology including FCVIF score calculation for all research model constructs. The CMB test showed that CMB's greatest FCVIF value is lower than 3.3, suggesting that the model is free of CMB. Common method bias (CMB) was assessed using the full collinearity variance inflation factor (FCVIF) approach proposed by Kock (2015). This method evaluates both vertical and lateral collinearity by examining whether a single factor inflates relationships across constructs, making it particularly suitable for PLS-SEM models using self-reported data. According to [54], FCVIF values below the threshold of 3.3 indicate that common method bias is unlikely to distort the results. In this study, all FCVIF values were below the recommended threshold, suggesting that common method bias does not pose a significant threat to the validity of the findings.

4.2 Instrument development

The questionnaire that deals with Digital Transformation, Enterprise Risk Management, Innovation Capability, Organizational Agility, and Firm Performance as shown in Table 2, was constructed using reputable literature and previous works, in addition to the literature sources from other studies. The items were chosen depending on the tactical and operational strategy of these constructs with regards to the context of the Jordanian Organizations as to what they are known for. Prior to full-scale data collection, the questionnaire was reviewed by academic experts and industry practitioners to ensure clarity, content validity, and contextual relevance. A pilot test was conducted with a small group of respondents, leading to minor wording refinements to enhance item clarity and comprehension.

Table 2. Sources of measurement

Constructs	References
Digital transformation	[1], [4]
Enterprise risk management	[11], [12]
Innovation capability	[16], [39]
Organizational agility	[45], [46]
Firm performance	[51], [36]

The final questionnaire was composed of five constructs. The five items had to be answered using the five points of a Likert scale from 1 to 5, where 1 would be the ‘strongly disagree’ and 5, the ‘strongly agree’ and hence, each item was measured on this Likert scale to find out the extent to which the respondents supported that statement. Table 3 shows the questionnaire items.

Table 3. Questionnaire items

Constructs	Code	Statements
Digital transformation	DT1	Our organization effectively uses digital technologies to enhance operational and strategic processes.
	DT2	Digital tools and platforms have significantly improved the quality and speed of our decision-making.
	DT3	We actively invest in automation and data analytics to support innovation and competitiveness.
	DT4	Digital transformation initiatives have fundamentally improved how our organization creates and delivers value.
Enterprise risk management	ERM1	Our organization has a structured framework to identify, assess, and mitigate potential risks.
	ERM2	Risk management practices are integrated into our strategic planning and decision-making processes.
	ERM3	Our enterprise risk management system enhances the organization’s ability to anticipate and respond to disruptions.
	ERM4	The implementation of ERM contributes to improved stability and long-term performance of our organization.
Innovation capability	IC1	Our organization frequently develops innovative products, services, or processes that strengthen competitiveness.
	IC2	We have the flexibility to rapidly adopt and implement new technologies to improve business operations.
	IC3	Innovation is embedded as a core element in our corporate culture and strategy.

Constructs	Code	Statements
	IC4	Our innovation initiatives have led to measurable improvements in efficiency and performance.
Organizational agility	OA1	Our organization quickly adapts to changes in market conditions and technological advancements.
	OA2	Our organization quickly adapts to changes in market conditions and technological advancements.
	OA3	Our teams are empowered to make timely decisions to address unexpected environmental changes.
	OA4	Organizational agility enables us to convert strategic insights into effective and immediate actions.
Firm performance	FP1	Our organization consistently meets or exceeds its financial and operational performance goals.
	FP2	Digital initiatives and innovation efforts have contributed to measurable performance improvements.
	FP3	Our firm demonstrates high adaptability and resilience in achieving sustainable growth.
	FP4	The integration of digital transformation and risk management practices has strengthened our overall performance.

Source: Authors' own creation

5. Data analysis

Several methodological rationales explain the decision to choose Partial Least Squares Structural Equation Modeling (PLS-SEM) over covariance-based SEM. Primarily, the study seeks to explain variation and forecast firm performance, as opposed to testing an established theory, making PLS-SEM a more fitting choice. Other reasons include the proposed model's complexity, as it contains multiple constructs, mediation pathways and interaction effects, which PLS-SEM handles efficiently. Additionally, the sample size and data characteristics accentuate PLS-SEM which offers robustness to non-normal data distributions and is best suited for predictive and exploratory research. Such factors are in line with established methodological considerations for SEM choice.

For this analysis, version 4 of Smart Partial Least Squares (POR) that conducts SEM through path modelling techniques was used. As regards the structural model assessment and hypotheses testing, this software helps in estimating the research model for example, among other things, the reliability and validity of the scales [55]. Smart PLS facilitates the analysis of structural equations and structural models which brings a high degree of flexibility in the modelling of complex interrelationships between the variables [55]. It is also applicable to limited samples making it helpful for field work which may have size limitations. Further, Smart PLS facilitates the treatment of latent variables which are essential in modelling the dimensional relationship among the variables. The precision of the estimates may at times be questionable if the correct type of data is not utilized [11]. There are also guidelines to be adhered to as they make the Smart PLS usable but not in the correct way voiding the results and any conclusions drawn from them [56]. It also becomes difficult to analyze methods particularly if there are many variables or relationships embedded in the models [57], [58].

5.1 The measurement model assessment

This study began with the assessment of the quality of the relationship between the items and constructs in the framework of the study through factor loading which is essential in assessing the reliability and validity of the measurements. It is therefore according to the PLS results known that all measurement items with regard to factor loadings tended to perform superiorly since they were above the established minimum limit of > 0.60 .

In order to achieve further confirmation regarding the homogeneity and reliability of the items measuring each construct, Minnesota Cronbach's Alpha (α) and Composite Reliability (CR) assessments were undertaken with a cut off threshold of > 0.70 . In addition, the Average variation Extracted (AVE) has been evaluated to estimate the degree of the variance observed in a construct's items relative to measurement error as part of the convergent validity assessment process with a cutoff threshold of > 0.50 . As shown in Table 4, the values of Cronbach's α and CR were above of cutoff threshold for all constructs. The AVE values also were above 0.5.

Table 4. Validity and reliability

Construct	Cronbach's alpha	CR	AVE
Digital transformation	0.786	0.86	0.607
Enterprise risk management	0.844	0.891	0.673
Firm performance	0.8	0.869	0.623
Innovation capability	0.866	0.908	0.713
Organizational agility	0.855	0.902	0.697

To assess the discriminant validity of the measurement, Fornell and Larcker's (1981) criterion was adopted.

Table 5. Discriminant validity

No.	Constructs	1	2	3	4	5
1	Digital transformation	0.779				
2	Enterprise risk management	0.741	0.82			
3	Firm performance	0.688	0.769	0.79		
4	Innovation capability	0.476	0.465	0.664	0.844	
5	Organizational agility	0.569	0.521	0.613	0.483	0.835

The results of Smart PLS, as shown in Table 5, confirm the discriminant validity of all research constructs as the square root of each AVE coefficient of each construct exceeded the correlation between the constructs. Although some constructs exhibit relatively high correlations, particularly between enterprise risk management and firm performance, this does not indicate conceptual redundancy. Conceptually, enterprise risk management represents a governance and decision-support capability, whereas firm performance reflects outcome-based financial and non-financial results. The observed correlation reflects a theoretically expected relationship, as effective risk governance enhances performance by reducing volatility, improving strategic alignment, and supporting informed decision-making. Statistically, discriminant validity is confirmed as the square root of the AVE for each construct exceeds inter-construct correlations, indicating that the constructs remain empirically distinct despite their close theoretical linkage.

5.2 The structural model

Further analysis on the results of the PLS path analysis are available in Table 6. The results reveal that 'Digital Transformation', 'Enterprise Risk Management', and 'Innovation Capability' have positively and significantly impacted the 'Organizational Agility'. Furthermore, Organizational Agility positively affects the Firm Performance which corroborates the part of the results which says that Organizational Agility is a mediator in between the independent constructs and the performance outcomes of the firm. The results also show that firms with greater digital capability, more sophisticated risk management systems, and better innovation are more agile and therefore better able to translate strategic plans into actual results.

Table 6. The results of PLS path analysis

H	Paths	β value	T value	P-value	The result
1	Digital transformation -> Firm performance	0.159	2.606	0.009	Significant
2	Enterprise risk management -> Firm performance	0.52	10.64	0	Significant
3	Innovation capability -> Organizational agility -> Firm performance	0.069	3.137	0.002	Significant
4	Digital transformation -> Organizational agility -> Firm performance	0.11	4.958	0	Significant

This table shows the Hypotheses testing (Source: Authors own creation)

This reinforces the dominance of ‘Organizational Agility’ as the principal means by which digital and strategic assets are converted into sustainable competitive advantage.

The outcome of Smart PLS (Figure 1), followed by Table 6, shows the Path coefficient analysis of the current research.

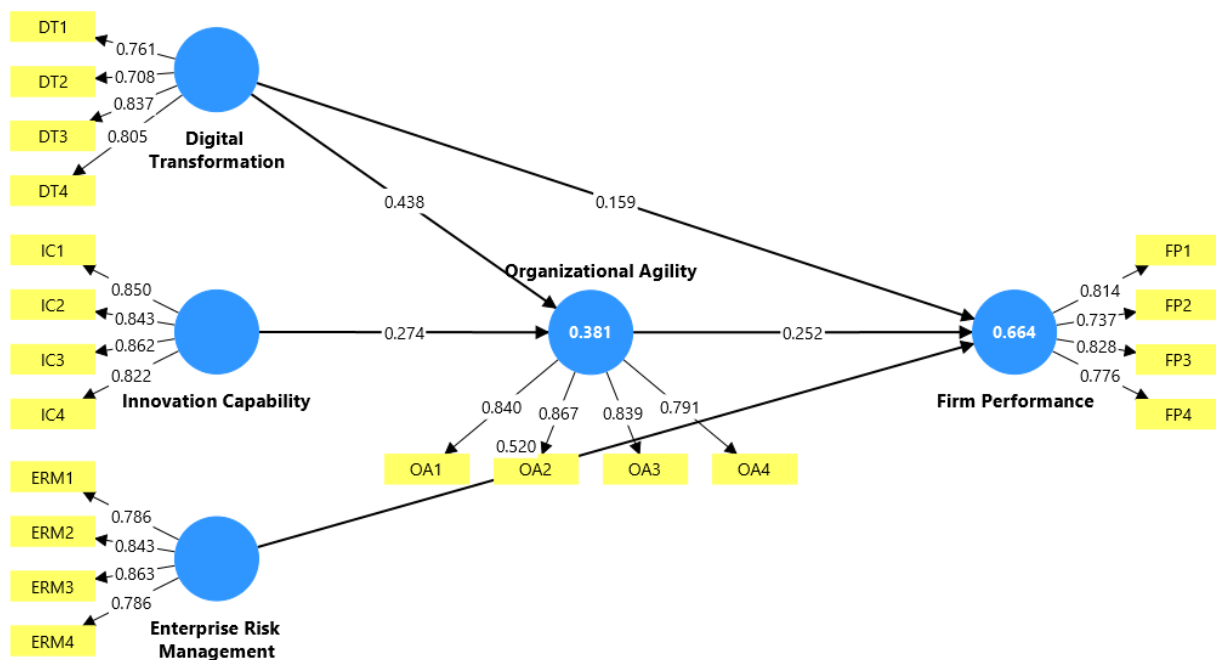


Figure 2. Path coefficient analysis

6. Discussion

The results of the research validate that the integration of digital technology has transformative effects on the performance of the firm which is consistent with earlier research that observed the positive effects of digital technology on competitiveness and operational efficiency. Digital automation, artificial intelligence, and analytics enhance the ability of a firm to innovate, optimize workflows, and elevate the quality of decisions made [23], [25]. The amalgamation of these factors mitigates the operational silos in the workflows and organizational structure and enhances the organizational ability to respond to the shifting environment (Feng & Ali, 2024). In addition, digital initiatives improve strategic management by increasing organizational clarity, coordination, and the use of data in decision making [27]. The results that performance can be achieved also relies on the control on leadership, digital competencies, and risk [28], [29]. In conclusion, the simple use of technology will not provide the desired outcome; rather organizational flexibility and effective management at all levels will guarantee adequate performance improvement.

The relations established between best business practices affirm that Enterprise Risk Management (ERM) is no longer a compliance burden but rather a strategic enabler and, vis, undertakes a stepwise alteration for the any

firm—firmly improving coordination, governance, and decision making [30], vis some vis, level awareness of risk [20]. Integrating risk awareness at every level of the organization helps to enhance operational efficiencies, financial stability, and long run sustain from value erosion [31], [32]. It also ensures alignment of strategic goals and objectives with the risk mitigation and control framework [34], thereby enabling the firm to agilely respond to and control market turbulence and regulatory compliance pressures. This evidence is a practical reflection of the works of [36], [38], who all affirm that fundamentally sound and optimally functional ERM is a risk opportunity approach that reworks and reconstructs the entire business ecosystem and positioning thereby improving systemic and systemic viability in turbulent atmospheres.

The findings should also be interpreted in light of the Jordanian cultural and institutional context. Jordanian organizations tend to exhibit relatively high power distance and centralized decision-making structures, which may influence the pace and effectiveness of digital transformation initiatives. In such contexts, enterprise risk management plays a particularly important role by formalizing decision processes and legitimizing innovation under uncertainty. Moreover, cultural emphasis on stability and compliance may initially constrain experimentation, making organizational agility a critical capability for balancing control with digital innovation. This contextual insight helps explain the strong role of ERM and agility observed in the study.

Based on the research, the Organization Agility has moderated the relationship between Innovation Capability and Firm Performance, which implies that Organization Agility is the reason that the Innovation Capability is translated into strategic outcomes. Innovative companies can produce new concepts and embrace new technologies, but the realized gains in performance are a function of the company's ability to innovate to rapidly shifting market conditions [39], [40]. Innovation allows flexible and rapid (strategic) reconfiguration of the company, and reorganization of the company's assets for the timely implementation of the developed innovative solutions [42], [43]. Innovation allows reduced inertial and procedural cross functional's implementation hurdles that lead to innovative cross collaboration in teams, so that the planned innovations can have innovations [44]. The research asserts organization innovation and performance relationship is positive stronger in the organization with higher level of agility in the empathy of innovation in the sickle with constant nomadic flexible shifting. Along with the findings [45], [46] described, it is proved that Organization Agility in the company's cross functional innovations is the moderate that connects the adoptions new innovation capabilities and organization systems and the performance outcomes changes.

The research proves that Digital Transformation, Organizational Performance and Organizational Agility as noted in the research add the most value to the firm when all three factors are used in conjunction as Agility acts as the critical capability that allows firms to turn potential value to actual value. Digital transformation increased effectiveness, integration, and decision-making, but its value is only fully actualized when companies are able to adjust to the changed environment as quickly as possible [26], [47]. Agility permits companies to identify and relocate assets, as well as to change rapidly in, and to, the market as well as to the changes in technology [48]. Firms that are more proactive are able to anticipate the transformations in the global digital environment and alter their strategies seamlessly [52]. Alternatively, rigid and formal companies constantly face the problem of digital stagnation despite the heavy investment in technology [50]. Thus, as supported by [49], [53], agility is the critical factor that allows the firm to change from sustaining advantage to continuously renewing and sustaining advantage.

7. Implications and future research

7.1 Theoretical implications

This study adds to the existing theory on Digital Transformation, Enterprise Risk Management (ERM), Organizational Agility, and Innovation Capability by constructing a unified framework to evaluate their effect on firm performance. Reconceptualizing these constructs within the Resource-Based View and Dynamic Capabilities Theory, the study treats them as interdependent strategic assets and adaptive systems that together generate enduring competitive advantage. The results affirm that agility serves as the active link that transforms

the technology-based and strategy-based potential of a firm into quantifiable results. It adds to the digital transformation literature by suggesting that agility goes beyond the shift from technology adoption to capability orchestration framework. Further, by proposing ERM as a value-enhancing function, the framework sheds light on the risk-performance paradox by demonstrating that risk governance increases the effectiveness of innovation and digital transformation in unpredictable environments.

7.2 Practical implications

The results of the study suggest that investments in digital technology can bring the greatest returns when paired with agility and flexible risk management structures. Managers should purposefully embed digital strategies in Omni-channel ERM to automate controls, streamline decision-making, and prepare for volatility. Firms should enhance their innovation capabilities through boundary-spanning and self-directed learning, aided by flexible momentum-maintaining processes that reduce strain to move. Leaders should advocate for a culture of improvisation, openness, and risk that ensures the strategic technology pathways bring competitive and economic results. The findings of this study can assist policymakers and regulators in designing integrated risk-innovation governance frameworks that cross sector boundaries. From a sectoral perspective, the findings offer tailored implications. In the banking and financial services sector, integrating ERM with digital platforms can enhance regulatory compliance, cybersecurity resilience, and data-driven innovation. For logistics and supply chain organizations, digital transformation supported by agility enables real-time visibility, risk anticipation, and operational continuity. In knowledge-intensive sectors such as IT and higher education, innovation capability combined with agile governance supports rapid service redesign and digital learning ecosystems. These sector-specific insights demonstrate that the proposed framework is adaptable across industries while preserving its strategic relevance. From a managerial standpoint, firms should operationalize digital transformation by embedding enterprise risk management within digital governance structures rather than treating it as a compliance function. Managers are encouraged to establish cross-functional digital-risk committees, integrate real-time risk analytics into digital platforms, and align innovation initiatives with risk appetite statements. To enhance agility, organizations should decentralize decision-making authority, invest in continuous digital skills development, and adopt flexible process architectures that allow rapid experimentation and scaling. These actions provide concrete pathways for translating digital investments into measurable performance improvements.

7.3 Limitations and future research

For all the help the study offers the proposed framework, the scope of the study remains empirical in Jordanian organizations. This could limit the reach of the study. Future research aims to check the model against various contexts to understand the differences in the economics of culture and the maturity of digital and risk technologies. Longitudinal studies could look at the risk and performance of agile systems over time to understand the causal relationships between them. Us as the overseers may borrow concepts of leadership orientations, digital literacy, and regulatory framework to offer deeper understanding to the explaining power. Moreso, the use of mixed methodology or sectoral studies may help understand the more sophisticated ways thru which digital transformation and ERM work together to improve the results of the firm. This will further deepen understanding of the theory and practice in the field of digital and risk integration. In addition, this study relies on cross-sectional data, which limits the ability to infer causal relationships among digital transformation, enterprise risk management, organizational agility, and firm performance. Future longitudinal research could better capture the dynamic evolution of these relationships over time. Moreover, the use of self-reported survey data may introduce common method and social desirability bias, despite statistical controls applied. Future studies could incorporate objective performance indicators or multi-source data to further strengthen empirical robustness.

8. Conclusion

This research focused on constructing and the practical validation of a new framework for correlating Digital Transformation with Enterprise Risk Management (ERM), Innovation Capability, and Organizational Agility in context of Firm Performance of the firms in Jordan. The evidence collected supports the argument that digital transformation and ERM are not just operational functions, but also sources of strategic advantage in shaping competitiveness and sustaining it over the long term. The evidence also indicates that digital transformation greatly improves a firm's operational performance and enhances its value through greater efficiency, better decision-making, and increase in innovative activities. However, these benefits are fully realized only with the presence of organizational agility, which provides the firm with the ability to reconfigure and rapidly adapt to the changes in the market and technology.

Furthermore, the research shows that ERM has a protective value that transcends traditional risk management by its value creation through better integration, strategic alignment, and pro-active management of valued opportunities. The firms that are able to position ERM within their digital and innovation strategies achieve better adaptability and performance, thus reinforcing the position of risk management as a strategic facilitator, not a compliance burden. Similar outcomes are also attained by firms where innovation capability is further enhanced by ERM agility which facilitates the quick transformation of novel ideas into implemented results, thus sustaining the competitiveness of the firm in the face of uncertainty.

Based on the theory of the Resource-Based View and Dynamic Capabilities Theory, the skills in digital, risk and innovation are dependencies on the organization's grit. Dynamic assets are whose value depends on the organization's agility. For practical purposes, managers should regard agility as an organizational philosophy and not processing, systematizing it in the technology strategy, and leadership and governance frameworks. This will assist firms in converting technological potential and strategies into performance sustainability.

The research proves that firm digitalization, when interlinked with enterprise risk management and guided by innovation and agility, is a driver of sustained performance. Therefore, the framework equips both theory and practice with a depth of insight on how scholars and practitioners of today can address the issues of the current digital age, maintaining the necessary resilience, agility, and competitive advantage in the fast-changing market.

Declaration of competing

The authors declare that they have no known financial or non-financial competing interests in any material discussed in this paper.

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Informed consent

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Declaration of use of AI in the writing process

The author(s) used QuillBot during preparation of this work to enhance the language. The author(s) reviewed and edited the work as necessary and take(s) full responsibility for the final version.

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