“The effect of digital transformation on family SME performance: The moderating role of family involvement”

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THE EFFECT OF DIGITAL TRANSFORMATION ON FAMILY SME PERFORMANCE: THE MODERATING ROLE OF FAMILY INVOLVEMENT

Abstract

The performance of family-owned small and medium-sized enterprises is a primary concern for their leaders. Through digital transformation, these firms are able to create added value and promote their growth. This study examines the effect of digital transformation on the performance of family SMEs, considering the moderating role of family involvement in management. As a result, a quantitative study was adopted using an online survey. Data were collected from a purposive sample of 182 Moroccan family SMEs, with responses obtained from their owner-managers between September and October 2025. In addition, the data were analyzed using structural equation modeling (SEM) with SMART PLS 4 software. The results confirm that the digital transformation of family SMEs has a positive effect on their commercial ($\beta = 0.532$, $p < 0.05$) and financial ($\beta = 0.249$, $p < 0.05$) performance but has no significant effect on operational performance ($\beta = 0.124$, $p > 0.05$). Furthermore, family involvement in management negatively moderates the relationship between digital transformation and commercial performance ($\beta = -0.166$, $p < 0.05$) and positively moderates the relationship between digital transformation and operational performance ($\beta = 0.309$, $p < 0.05$). Moreover, family involvement does not affect the relationship between digital transformation and financial performance ($\beta = 0.040$, $p > 0.05$). The results explain the importance of implementing new digital technologies in family SMEs to improve performance and highlight the nuanced, dual role of family involvement as both an inhibitor and a facilitator.

Keywords digital transformation, SMEs, family businesses, performance, family involvement, Morocco

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INTRODUCTION

In a highly competitive and volatile environment, digital transformation presents organizations with an opportunity to succeed in their business objectives. This transformation involves making major changes in the organizational characteristics and restructuring the internal framework through the integrated use of information and communication technologies (Teng et al., 2022). The issue now is no longer whether an organization should adopt digital tools and technologies, but rather how it can use them successfully to secure a competitive advantage (Valaskova et al., 2025). Furthermore, digital transformation applies to all categories of enterprises, including family-owned small and medium-sized enterprises (Masmoud & Tichoua, 2025). In family businesses, digitalization initiatives represent the most vital instruments for enhancing the company's performance and ensuring its sustainability over the long term within a dynamic environment (Issah & Calabro, 2024; Wu et al., 2025). Therefore, digital transformation

enables SMEs to enhance their performance through gains in operational efficiency, customer engagement, and revenue. It can also contribute to significant profit gains for enterprises (Merín-Rodrigáñez et al., 2024).

The personal commitment of family SME managers to using digital tools strengthens their capacity for employing digital technologies, thereby enhancing their overall performance (Wu et al., 2025). Therefore, family leaders, through effective management and integration of innovation resources, are particularly capable of increasing their capacity to convert IT efficiency into revenue growth (Martínez-Alonso et al., 2020). Family SMEs possess several distinctive characteristics, including a profound commitment and involvement of the family in management, as well as a long-term strategic vision. These characteristics facilitate more adaptable organizational structures and create opportunities for the company to leverage digital technologies to improve performance (Gargallo Castel & Galve Górriz, 2017). In general, family SMEs allocate their resources, implement strategies, and use a variety of technological tools to enhance their performance by adapting to the biggest trends in their environments. Their unique characteristics, such as family involvement in management, have the potential to either expedite the process of organizational change toward digitalization in order to generate added value or to complicate it.

Existing research provides varying findings related to family involvement in SMEs management and its effect on performance. To address this gap, the present study provides a comprehensive examination of how digital transformation affects the performance of family SMEs, with a specific focus on the pivotal moderating role played by family involvement in this process.

1. LITERATURE REVIEW AND HYPOTHESES

Understanding the determinants of organizational performance and competitiveness remains a central question in management research. Scholars have long examined this issue through various theoretical lenses, predominantly focusing on how internal and external resources shape a firm's growth and development (Valdez-Juárez et al., 2023). Among these perspectives, the resource-based view (RBV) theory is one of the most influential theories in the discipline of business performance. This theory is regarded as an approach proposing that a company attains competitiveness by dominating both tangible and intangible resources (Penrose, 1959; Barney, 1991). Financial, organizational, human, and managerial resources comprise these assets. Additionally, studies have shown organizational resources associated with technology as a critical component of business development initiatives (Venkataraman, 2004; Julienti Abu Bakar & Ahmad, 2010).

In this context, small and medium-sized family businesses leverage their resources and capabilities to implement digital technologies to enhance their performance and ensure their sustainability. This type of firm has several specific characteristics that differentiate it from other categories of businesses. As a result, there is a paradox between the perception of gradual change within family businesses and the sustained acceleration of digitization. This divergence highlights the need for further study of the integration of digital technologies in family SMEs (Tirdasari et al., 2024). Consequently, a strategic approach is necessary for digital transformation, which may be especially critical for family SMEs. Family businesses might be managed by owners or managers. However, the family maintains control over the business, potentially influencing its organizational transformation (Clauss et al., 2020; Bouncken & Schmitt, 2022).

Many researchers have demonstrated interest in the socio-economic phenomenon of the digitalization of small businesses (Teng et al., 2022; Liu et al., 2024). The implementation of digital technologies in this type of organization has emerged as a successful approach for enhancing competitiveness through internal process innovation, cost reduction, and revenue growth by digital interactions with customers and suppliers (Ulas, 2019; Molina-Castillo et al., 2024; De Souza Regis et al., 2025). Digital transformation represents an

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imperative for companies that want to adopt and keep up with new technology. Information technology has provided the opportunity to optimize organizational processes. Therefore, companies mainly aim to improve how they work and reduce costs through digital transformation (Björkdahl, 2020; Guo & Xu, 2021).

In this regard, the efficiency and effectiveness of commercial practices are being transformed in the digital age by the use of digital technologies, including e-commerce, which has a positive effect on the performance of SMEs (Harini et al., 2023). Moreover, commercial operations have become increasingly competitive and successful in the digital era (Hussain et al., 2022). Abudaqa et al. (2022) demonstrate that the implementation of digital transformation strategies facilitates the regulation of commercial processes by employing advanced technologies, thereby enhancing commercial performance.

The adoption of digital tools enables organizations to monitor fluctuations in customer demand and competitor actions, as well as to accumulate and integrate market data to enhance business efficiency (Soluk et al., 2021; Kim & Jin, 2024). Specifically, the utilization of social media is an effective approach to enhance the commercial result (Muninger et al., 2019). In this area, small and medium-sized enterprises build relationships with their customers by implementing digital technologies that facilitate personalized and seamless interactions. This approach fosters customer loyalty and enhances the organization's efficiency, ultimately resulting in business success (Prihandono et al., 2024). Consequently, digitalization contributes to improving commercial processes (Valiyev et al., 2022). In this regard, Van Tonder et al. (2024) indicate that the commercial performance of SMEs is correlated with innovation within digital transformation. In addition, they suggested that the more SMEs enhance their innovation through digital transformation, the more their overall commercial performance improves.

In another context, operational performance is enhanced by digital transformation. By digitalization, businesses optimize production processes, increase employee productivity, and enhance asset efficiency, thereby minimizing transaction costs. The effective exchange of information within organizations is facilitated by a unified digital platform or system, which enhances interaction among departments and operational procedures (Mikalef et al., 2020; Guo & Xu, 2021). The organization's operation is being revolutionized by the implementation of technologies like e-commerce (Hussain et al., 2022). In addition, Omrani et al. (2024) discovered that digital maturity allows companies to use digital technologies to redefine their operations. It has been proposed that the digital maturity of SMEs includes factors such as operational processes, organizational structures, and customer experience (B. A. Çallı & L. Çallı, 2021; Karadağ et al., 2024). Therefore, digitalization, at the operational level, reduces costs associated with transactions, enabling employees, customers, and networks to access information and communicate more efficiently (Roman & Rusu, 2022).

Digital transformation has the capacity to enhance profitability by fostering business growth through innovation and digital changes. Thus, this technological shift is effective not only in improving operational efficiency but also in generating opportunities for value creation and growth, thereby boosting profits. Although enhancing operational processes indirectly contributes to improved financial performance, a primary objective of digitalization is to increase the market value of companies in order to achieve profitability (Guo & Xu, 2021). According to Prakasa and Jumani (2024), digital transformation directly and significantly affects the performance of small businesses, suggesting that the more effectively businesses are managed digitally, the greater their potential to improve financial performance. Similarly, Roman and Rusu (2022) show that digital technologies positively impact net revenue and productivity. The implementation of digital technologies, including automation, AI, and IoT, substantially enhances organizational efficiency, thereby resulting in higher profits (Kamble et al., 2020). Therefore, SMEs can enhance their financial performance, specifically in the areas of budgeting and financial management, by using various devices, computer programs, and digital applications in a suitable and efficient manner (Prakasa & Jumani, 2024).

The relationship between digital transformation and firm performance in family businesses is

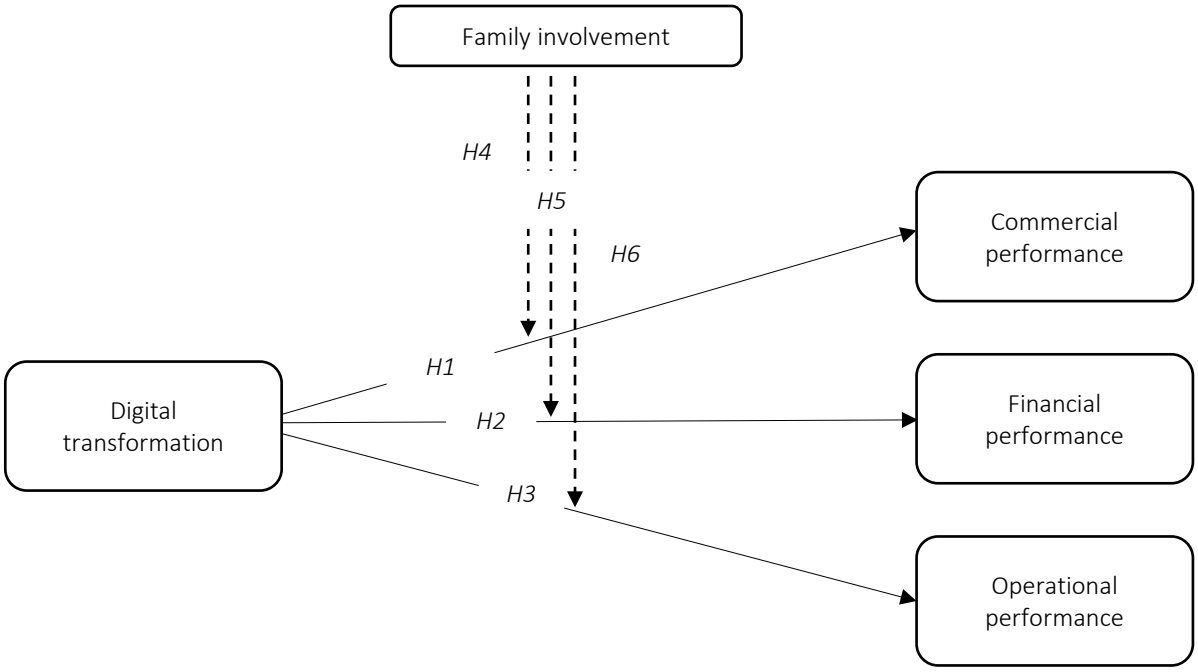

Figure 1. Conceptual model

fundamentally shaped by the degree and nature of family involvement. Grounded in the socio-emotional wealth (SEW) perspective, family firms are primarily motivated by the preservation of their non-financial, affective endowments, which can make them willing to bear significant performance risks to maintain control (Gómez-Mejía et al., 2007; Berrone et al., 2012). This core imperative means that family involvement acts as a critical contingency, influencing how digital capabilities translate into performance.

The mechanisms of this influence are multifaceted. Through involvement in management, particularly via family CEOs, strategic decisions regarding digitalization are filtered through a unique lens that prioritizes long-term family-centric goals over purely economic logic (Zona, 2016; Wu et al., 2025). Paradoxically, while SEW protection might suggest conservatism, the strong interdependence within family firms can also foster innovative potential through efficient resource pooling (Penney & Combs, 2013; Chrisman et al., 2013). This underscores the significant heterogeneity among family firms (Melin & Nordqvist, 2007) and highlights the necessity to examine moderating factors (Chrisman et al., 2012). Consequently, the impact of digital transformation is not uniform but moderated by family involvement. Empirical evidence confirms this conditional relationship. For instance, Martínez-Alonso et al. (2020) suggest that the use of technology and the performance of family businesses are moderated by family involvement in management. More precisely, Issah and Calabro (2024) demonstrate that the prioritization of family objectives can identify the circumstances under which this relationship turns negative. Their research is pivotal, suggesting that the positive performance returns from information technology use can be attenuated or even reversed when it conflicts with the preservation of SEW, leading families to prioritize non-economic goals. Therefore, understanding the digital transformation–performance nexus requires moving beyond a direct association to analyze how family involvement sets the boundary conditions for its success or failure.

The scientific literature has thus exposed all the relationships between digital transformation and various aspects of performance: commercial, financial, and operational. Additionally, the literature highlights the role of family involvement in this relationship.

This study aims to analyze the effects of digital transformation on the performance of family SMEs, taking family involvement as a moderating variable. Based on the syntheses of studies examining the relationships between the selected vari-

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ables, we formulated the following hypotheses and conceptual model (Figure 1):

H1: Digital transformation has a positive effect on commercial performance.

H2: Digital transformation has a positive effect on financial performance.

H3: Digital transformation has a positive effect on operational performance.

H4: Family involvement in management moderates the relationship between digital transformation and commercial performance.

H5: Family involvement in management moderates the relationship between digital transformation and financial performance.

H6: Family involvement in management moderates the relationship between digital transformation and operational performance.

2. METHODS

This paper adopts deductive reasoning and a positivist approach, moving from the general, which represents the scientific literature, to the specific, which reflects the empirical study. The literature analysis enabled us to identify digital transformation as an independent variable and the performance of family SMEs as a dependent variable. Furthermore, performance is conceptualized as a three-dimensional construct: commercial, financial, and operational. We included family involvement in management as a moderating variable, which serves as a particular case in our investigation.

Quantitative research was conducted empirically in the form of an online questionnaire to collect data from Moroccan family SMEs. The questionnaire was developed using measurement scales adapted from validated instruments in prior empirical studies within the fields of digital transformation and family business research (Appendix A). This adaptation ensures the reliability and validity of the constructs. All items were measured using a five-point Likert scale. Furthermore, the survey was distributed between September and October 2025 to a broad group of potential owner-managers of family SMEs operating in Morocco, based on their availability and the recommendations of a network of individuals. Therefore, the respondents were chosen through a non-random sampling method, which involves convenience and snowball sampling. Moreover, to target family SMEs, we applied the following criteria. First, in the Moroccan context, SMEs are classified based on their total workforce, which is between 10 and 200 employees. In addition, family businesses are specifically targeted by two criteria: the family's ownership of the majority of voting rights and the involvement of at least one family member in management (Miller & Le Breton-Miller, 2005). Consequently, we collected 182 responses to our questionnaire that met the criteria we defined.

From Table 1, which presents the description of the respondents, it is first possible to observe a predominance of men (75.8%) over women (24.2%). Regarding the age of the participants, a predominance is observed among individuals aged 36 to

Table 1. Demographic profile of the respondents

Demographic variables	Categories	Frequency	Ratio (%)
Gender	Female	44	24.2%
	Male	138	75.8%
Age	Under 25 years old	1	0.5%
	25–35 years old	44	24.2%
	36–45 years old	94	51.7%
	Over 45 years old	43	23.6%
Educational level	High school	20	11.0%
	University	107	58.8%
	Graduate school	55	30.2%
Industry	Commerce	82	45.1%
	Manufacturing	53	29.1%
	Services	47	25.8%

45 years (51.7%). In second place are respondents aged 25 to 35 (24.2%), followed by those over 45 (23.6%), and finally, respondents under 25 (0.5%). Furthermore, the educational level of the participants is distinguished by the predominance of individuals who have attained a university degree (58.8%). Subsequently, we identify individuals who have held a graduate degree (30.2%). The remaining (11%) gap is attributable to individuals with a secondary education level. The firms selected for our study are distributed across various sectors of activity: commerce (45.1%), manufacturing (29.1%), and services (25.8%).

Moreover, we employed SMART PLS 4 software to analyze the collected data using structural equation modeling (PLS-SEM). This method enables an analysis of complex relationships between the variables.

3. RESULTS

The analysis of the reliability and validity of measurement scales represents an important step in an empirical study. The internal consistency reliability is the degree to which indicators that measure the same construct are related to each other. The two primary metrics used in PLS-SEM are Cronbach's alpha and composite reliability. These metrics have greater values when the level of reliability is higher (Hair et al., 2021).

Table 2 displays the internal reliability of variables. Cronbach's alpha values mostly are above 0.7, and composite reliability values indicate excellent internal reliability, particularly for the financial performance (rho_c = 0.909) and operational performance (rho_c = 0.919). The AVE is also presented in Table 2, and it is determined from the extracted variance. According to Hair et al. (2017), the empirical criterion for adequate convergence is an AVE > 0.50, which signifies that the construct score comprises more than half of the measure's variance. Thus, the AVE thresholds obtained indicate convergent validity of our measurement scales as long as the majority of the thresholds are above 0.5.

Next, we assessed discriminant validity. This type of validity quantifies the extent to which a construct is distinguished from other constructs in the structural model (Hair et al., 2021). One of the criteria for discriminant validity is the cross-loadings, which are illustrated in Table 3. This ensures that each indicator associated with the latent construct is distinct from the other constructs. Additionally, each variable indicator in the column exhibits a higher correlation in the same construct than the other indicator thresholds in the same column, as illustrated in Table 3.

Table 3. Cross-loadings

Constructs	CP	DT	FI	FP	OP
CP1	0.658	0.251	−0.023	−0.055	0.129
CP2	0.674	0.392	−0.083	−0.015	0.079
CP3	0.859	0.480	−0.069	0.070	0.029
CP4	0.812	0.513	−0.035	0.094	0.062
DT1	0.398	0.755	0.003	0.062	0.047
DT2	0.409	0.736	−0.009	0.134	0.035
DT3	0.488	0.881	−0.021	0.242	0.043
DT4	0.508	0.842	−0.032	0.288	0.067
FI1	−0.016	0.108	0.768	0.099	0.140
FI2	−0.008	0.012	0.628	0.047	0.103
FI3	−0.062	−0.052	0.909	0.017	0.192
FI4	−0.107	−0.083	0.872	0.011	0.219
FP1	0.022	0.213	0.050	0.896	0.139
FP2	0.047	0.253	0.086	0.897	0.171
FP3	0.006	0.074	0.015	0.789	0.048
FP4	0.077	0.189	−0.031	0.797	0.133
OP1	0.028	0.029	0.112	0.159	0.798
OP2	0.024	0.021	0.175	0.197	0.845
OP3	0.107	0.057	0.208	0.124	0.896
OP4	0.109	0.086	0.211	0.106	0.896

Note: CP = Commercial performance; DT = Digital transformation; FI = Family involvement; FP = Financial performance; OP = Operational performance.

Table 2. Reliability and validity

Constructs	Cronbach's alpha	Composite reliability (rho_c)	Average variance extracted (AVE)
CP	0.753	0.840	0.571
DT	0.821	0.880	0.649
FI	0.818	0.876	0.643
FP	0.876	0.909	0.716
OP	0.885	0.919	0.739

Note: CP = Commercial performance; DT = Digital transformation; FI = Family involvement; FP = Financial performance; OP = Operational performance.

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The Fornell–Larcker indicator is another condition for discriminant validity. It enables the comparison of the squares of the correlations between latent variables (Fornell & Larcker, 1981). Therefore, it is evident from Table 4 that each construct studied shows a strong correlation with itself, and the value of the latent variable in each diagonal is higher than the other variables. Thus, this condition is verified.

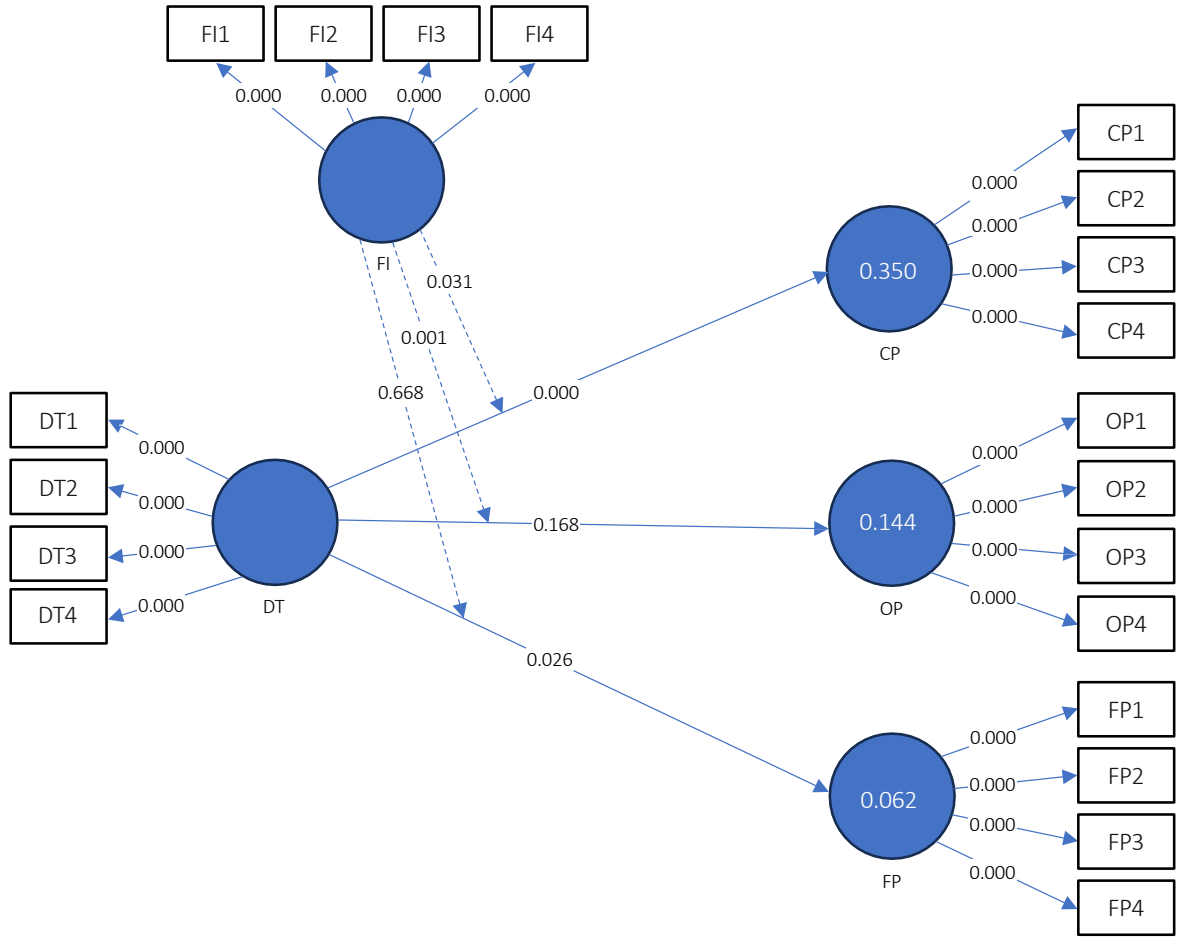
Table 4. Fornell–Larcker values

Constructs	CP	DT	FI	FP	OP
CP	0.756				
DT	0.565	0.806			
FI	−0.071	−0.021	0.802		
FP	0.049	0.241	0.046	0.846	
OP	0.087	0.061	0.214	0.163	0.860

Note: CP = Commercial performance; DT = Digital transformation; FI = Family involvement; FP = Financial performance; OP = Operational performance.

By employing the bootstrapping procedure in structural equation modeling, Table 5 summarizes all hypotheses tests that relate to the relationships among the independent, dependent, and moderating variables. Initially, Table 5 shows a strong and positive relationship between digital transformation and commercial performance ($\beta = 0.532$; $p < 0.05$). Thus, H1 is accepted. Simultaneously, the findings ($\beta = 0.249$; $p < 0.05$) suggest that the financial performance of family SMEs is positively affected by the digital transformation. Therefore, H2 is accepted. In addition, the relationship between digital transformation and operational performance is not statistically significant ($\beta = 0.124$; $p > 0.05$). Thereby, H3 is rejected.

Furthermore, the results of the hypotheses tests ($\beta = -0.166$; $p < 0.05$) indicate that family involvement has a negative moderating effect on digital



Note: CP = Commercial performance; DT = Digital transformation; FI = Family involvement; FP = Financial performance; OP = Operational performance.

Figure 2. Path results of the research model

Table 5. Hypotheses testing

Relationship	Original sample (O)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P-values	Result
DT → CP	0.532	0.081	6.549	0.000	Supported
DT → FP	0.249	0.112	2.232	0.026	Supported
DT → OP	0.124	0.090	1.380	0.168	Rejected
FI x DT → CP	–0.166	0.077	2.160	0.031	Supported
FI x DT → FP	0.040	0.093	0.429	0.668	Rejected
FI x DT → OP	0.309	0.094	3.300	0.001	Supported

Note: CP = Commercial performance; DT = Digital transformation; FI = Family involvement; FP = Financial performance; OP = Operational performance.

transformation and commercial performance, which weakens the positive relationship between these two variables (Figure 2). Similarly, family involvement positively moderates the relationship between digital transformation and operational performance ($\beta = 0.309$; $p < 0.05$). Thus, H4 and H6 are accepted. However, H5 is rejected, as the results ($\beta = 0.040$; $p > 0.05$) indicate an insignificant effect of family involvement on the relationship between digital transformation and financial performance.

4. DISCUSSION

Based on empirical findings, family SMEs' commercial performance is positively affected by their digital transformation, and there is a strong relationship between the two variables. This suggests that using customer relationship-focused technologies plays a key role in the transformation of commercial operations. Our findings are consistent with Abudaqa et al. (2022), Prihandono et al. (2024), and Van Tonder et al. (2024), who demonstrated that SMEs can benefit from digital transformation in terms of managing customer relationships, increasing market share, and boosting revenue, all of which improve their commercial performance. Similarly, a strong digital business environment and the technology tools that make it up enhance customer satisfaction, which in turn enhances commercial operations (Fernández-Portillo et al., 2024). In brief, the strong relationship between digital transformation and commercial performance can be attributed to the use of digital tools, such as CRM, social media, and e-commerce. These tools offer family SMEs the opportunity to increase their commercial performance.

Moreover, the results of the hypotheses tests indicate that the financial performance of family SMEs is positively affected by digital transformation. This empirical finding aligns with the conclusions of Roman and Rusu (2022) and Prakasa and Jumani (2024), who have supported the positive relationship between these variables. Therefore, family SMEs can enhance their financial performance, particularly in terms of productivity and net outcomes. This type of firm is strategically investing in the adoption of new technologies through creative tactics that facilitate digital transformation. As a result, this organizational change generates added value and improves profitability. Conversely, our empirical findings suggest that there is an insignificant relationship between operational performance and digital transformation. This latter outcome is in direct opposition to Mikalef et al. (2020), Guo and Xu (2021), and Hussain et al. (2022), who support the positive relationship between digital transformation and operational performance. This insignificant relationship might be explained by the absence of high-level exploitation of digitalization in the internal operational process of family SMEs.

Our hypotheses tests suggest that the effect of digital transformation on commercial performance is negatively moderated by family involvement. The relationship between these two variables is weakened by this involvement. This suggests that a family's involvement in a business, whether through ownership or leadership, can result in the adoption of objectives that are solely motivated by familial and non-economic factors (Chrisman et al., 2012). Family leaders are often resistant to change, which may hinder the adoption of technologies, particularly those that are directly related to commercial aspects on the market side. Additionally,

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the relationship between digital transformation and operational performance is positively moderated by family involvement. Although there is no direct relationship between these two variables, their relationship is robust when family members are involved in organizational management. These findings are in accordance with Gargallo Castel and Galve Górriz (2017) and Martínez-Alonso et al. (2020), who demonstrated that the impact of ICT on business performance is positively moderated by family involvement. Moreover, this involvement will be more significant for organizations that have a high number of family members who are actively involved in management. In contrast, the relationship between digital transformation and financial performance is not moderated by family involvement, which contradicts the results of Martínez-Alonso et al. (2020).

Generally, the distinctive characteristics of family businesses establish specific conditions that can regulate the effectiveness and utilization of technology (Gargallo Castel & Galve Górriz, 2017). In this regard, the family's participation in management is an essential requirement for family businesses to fully capitalize on their familial identity, which is advantageous for the development of the capacity to successfully transform innovations and generate added value (Martínez-Alonso et al., 2022).

CONCLUSION

This study provides a quantitative analysis of the effect of digital transformation on the performance of Moroccan family SMEs, with a focus on family involvement in management as a moderating variable.

The findings show that digital transformation positively affects the commercial and financial performance of family SMEs but has no significant effect on operational performance. Furthermore, family involvement in management negatively moderates the relationship between digital transformation and commercial performance but positively moderates the relationship between digital transformation and operational performance. Therefore, family involvement in organizational management is a specific factor that can hinder or promote the digital transformation of family SMEs to improve their performance. The findings of this study suggest several implications for Moroccan family SMEs. Primarily, digitalizing the work process is essential for family SMEs, particularly for external communication with customers, to gain a commercial advantage over competitors. Second, SME leaders should adopt digital technologies to improve their financial situation, as this is directly influenced by the use of digital tools. Finally, family involvement in management should positively influence decisions that benefit the company, not just family objectives.

This study has some limitations. One is that our sample is limited to the Moroccan context, as well as the generalization of the results on a large scale is not possible. Future research could study the influence of factors such as family culture and leadership style on the digital transformation of family SMEs. Exploratory qualitative studies also provide an opportunity to understand the phenomenon being studied and to identify the specificities of family SMEs in improving their performance and using emerging technologies.

AUTHOR CONTRIBUTIONS

Conceptualization: Abderrahim Masmoud.
Data curation: Abderrahim Masmoud.
Formal analysis: Abderrahim Masmoud.
Funding acquisition: Abderrahim Masmoud.
Investigation: Abderrahim Masmoud.
Methodology: Abderrahim Masmoud.

Project administration: Abderrahim Masmoud.
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Validation: Youssef Tichoua.
Visualization: Youssef Tichoua.
Writing – original draft: Abderrahim Masmoud.
Writing – review & editing: Youssef Tichoua.

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APPENDIX A

Table A1. Measurement scales

Variables	Code	Items	References
Digital transformation	DT1	We have increased the use of digital technologies, such as e-commerce, social media, and artificial intelligence.	Nasiri et al. (2020), AlNuaimi et al. (2022), Marolt et al. (2024), Gyamerah et al. (2025)
	DT2	Information is exchanged within our organization by means of digital technologies.	
	DT3	In our organization, we enable better integration between various business processes by utilizing digital technologies.	
	DT4	We have accelerated the digitalization of our core internal processes.	
Commercial performance	CP1	Customers have shown their loyalty to our organization's products since we implemented digital technologies.	Wang et al. (2022), Surahman et al. (2023), Zhang et al. (2023), Prihandono et al. (2024)
	CP2	We observed a substantial increase in sales since implementing digital technology.	
	CP3	Our customers express higher satisfaction with the services and provide positive feedback following the implementation of digital technology.	
	CP4	The market share increases as a result of the adoption of digital technology.	
Financial performance	FP1	We observed an increase in profitability and profit margins following the adoption of digital technology.	Teng et al. (2022), Wang et al. (2022), Surahman et al. (2023), Valdez-Juárez et al. (2024)
	FP2	We observed a rise in liquidity following the implementation of digital technology.	
	FP3	The digital transformation of our organization has resulted in an increase in return on investment.	
	FP4	The digital transformation of our organization has resulted in an increase in return on equity.	
Operational performance	OP1	The regular operations of our organization have become more adaptable to accommodate personalized demands as a result of the implementation of digital technology.	Valdez-Juárez et al. (2023), Onngam and Charoensukmongkol (2024), Wang and Zhang (2025)
	OP2	Our company has been able to offer its products and services more rapidly as a result of the implementation of digital technology.	
	OP3	After the implementation of digital technology, we have observed an enhancement in the efficacy of production processes.	
	OP4	The company optimizes resource utilization and cost reduction following the implementation of digital technology.	
Family involvement	FI1	The strategic decisions of the company are under the control of the family members.	Lee and Rogoff (1996), Klein et al. (2005), Berrone et al. (2012)
	FI2	Family members hold most of the management positions.	
	FI3	The board of directors consists mainly of family members.	
	FI4	Preserving the company's independence and family control is important.	

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