



Digital Transformation and Its Influence on Governance: Insights from Moroccan Service Sector SMEs

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Abstract: *The current digital era presents both challenges and opportunities for businesses worldwide. This research delves into the relationship between digital transformation and the governance of Small and Medium-sized Enterprises (SMEs) in the Moroccan service sector. Utilizing responses from a survey of leaders from 200 SMEs throughout Morocco, the study employs Structural Equation Modeling (SEM) to elucidate the intricate relationships. The results indicate a notable link between the adoption of digital strategies and improved governance. Yet, hurdles such as integrating technology and enhancing employee skills remain. This paper provides a deeper understanding of the nexus between digital transformation and governance, spotlighting the distinct context of Moroccan SMEs.*

1. INTRODUCTION

Digital transformation, a topic extensively discussed in academic literature, serves as a pivotal driver of competitiveness in today's world (Porter & Heppelmann, 2014; Westerman et al., 2014). In a global setting marked by intensified competition and rapid technological advancements, companies, regardless of size, are consistently challenged to adapt their methods and strategies. For small and medium-sized enterprises (SMEs), this transformation extends beyond mere digitization of operations. It has a profound impact on various organizational aspects, including governance (Bharadwaj et al., 2013). Morocco, as an emerging economy, presents a unique case in this context. Although the nation's service sector has demonstrated significant growth in recent years (World Bank, 2018), the nuances of digital transformation and its influence on SME governance in this sector remain relatively uncharted. With this backdrop, this article aims to bridge this knowledge gap by highlighting the relationship between digital transformation and the governance of SMEs in Morocco's service sector. By surveying business leaders, we endeavor to understand how adopting digital practices shapes the management and direction of these entities.

To delve into the impact of digital transformation on Moroccan SMEs' governance, we employed Structural Equation Modeling (SEM). Esteemed for its efficacy in probing complex theories in social research and business (Hair et al., 2016), SEM allows for intricate analysis of

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relationships between multiple dependent and independent variables. By leveraging SEM, we identified both direct and indirect relationships between digital transformation and various facets of SME governance. To ensure the validity of our research, we followed the guidelines established by [Anderson and Gerbing \(1988\)](#) concerning measurement validation and model fit assessment. As such, this article is organized as follows: the second section introduces a literature review on the impact of digitalization on the governance of SMEs in the Moroccan service sector. The third section outlines the conceptual model and its underlying hypotheses. The final section presents the results accompanied by a discussion and conclusion.

2. LITERATURE REVIEW

Digital transformation has emerged as a predominant topic in academic literature in recent years, particularly regarding its impact on businesses, with a specific emphasis on SMEs. [Berman \(2012\)](#) posits that digital transformation pertains to the utilization of digital technologies to innovate or refine existing processes, corporate culture, and customer experiences to adapt to market shifts. It isn't solely confined to the integration of technology into operations; it also includes the potential for a comprehensive revamp of business operations and models. Although the majority of studies have centered on digital transformation within large corporations, [Matt et al. \(2015\)](#) noted that SMEs, given their adaptability and scale, are in an optimal position to capitalize on digital transformation, despite their often-constrained resources. A pivotal aspect of digital transformation is its effect on corporate governance. [Hess et al. \(2016\)](#) emphasized that digitization overturns conventional governance structures, fostering enhanced communication and swifter decision-making. This is especially pertinent for SMEs, where communication pathways are generally more streamlined than in larger corporations. Nonetheless, despite its advantages, digital transformation poses challenges, predominantly for SMEs. As highlighted by [Reis et al. \(2018\)](#), these challenges encompass limited resources, a deficiency in technical expertise, and apprehensions regarding security and privacy.

Moreover, the literature review presented below offers insight into the pivotal works on this subject. In this framework, [Berman \(2012\)](#) illuminated how digital transformation influences the operations, culture, and customer experiences of businesses. He points out that this transformation isn't merely about integrating new technologies but also entails a shift in business models and operational processes. [Matt et al. \(2015\)](#) centered their discussion on the strategies that businesses, notably SMEs, can employ to attain a successful digital transformation. The authors stress the significance of flexibility and adaptability for SMEs attempting to navigate an ever-changing digital environment. [Hess et al. \(2016\)](#) deliberated on the diverse strategic choices SMEs might evaluate when orchestrating their digital transformation, accentuating the paramount importance of governance in guaranteeing successful execution. [Reis et al. \(2018\)](#) delivered an exhaustive review of research on digital transformation, with a special focus on the hurdles and prospects for SMEs. The authors propose that despite the myriad potential advantages, SMEs might grapple with issues like constrained resources and a deficiency in technical expertise. [Verhoef et al. \(2021\)](#) examined digital transformation through a multidisciplinary lens, spotlighting its ramifications on various facets of corporate governance, spanning from strategy to marketing and including human resources.

3. THE CONCEPTUAL MODEL

Digital transformation profoundly impacts the way companies operate, interact, and evolve. Despite having limited resources compared to larger corporations, Small and Medium Enterprises (SMEs) are at the vanguard of this transformation, seeking competitive edges through digitization.

The success of digital transformation hinges not just on the adoption of new technologies but also on how these technologies are integrated and managed within the organization, underscoring the vital role of governance (Anim-Yeboah et al., 2020; Matt & Rauch, 2020; Ziólkowska, 2021).

Our conceptual model delves into the effects of digital transformation on the governance of SMEs, emphasizing the pivotal variables in both digital transformation and SME governance. We propose the following hypotheses:

H1: Digital transformation has a direct positive effect on SME governance.

H2: External elements, such as market trends and regulations, shape the impact of digital transformation on SME governance.

H3: Digital competencies act as a mediator between digital transformation and SME governance.

Table 1. Variables and Their Measurement Scales

Variables	Measurement Scale	Meaning	Authors
Independent Variables:			
Digital Transformation (DT):	Technology Adoption (Tech):	This refers to the degree to which an SME adopts and uses new technologies in its daily operations. This can include the adoption of software, hardware, or other technological tools.	Kumar et al. (2021)
	Process Digitization (PDig):	This pertains to the conversion of traditional business processes into digital processes. This could include going paperless or using electronic management systems.	Doyle and Cosgrove (2019)
Environmental Factors (EF):	Market Trends (Market):	This concerns current or anticipated market developments that may influence an SME's performance, such as consumer demand or industry innovations.	Genc et al. (2019)
	Regulations (Reg):	This refers to laws and regulations that may impact an SME's operations, like data protection regulations or industry standards.	Zheng et al. (2021)
	Competition (Comp):	This pertains to the level and nature of competition that the SME encounters in its sector.	Masyhuri (2023)
Dependent Variable:			
SME Governance (SMEG):	Decision Making (Dec):	This pertains to how decisions are made within the SME, such as centralized decision-making or employee participation.	Hauser et al. (2020)
	Internal Communication (Com):	This concerns the quality and effectiveness of communication among various levels and departments within the SME.	Mbhele and De Beer (2022)
	Organizational Structure (Struc):	This refers to how the SME is structured, for instance, whether it has a hierarchical, matrix, or flat structure.	Gentile-Lüdecke et al. (2020)
Mediating Variables:			
Digital Skills (DS):	Technical Skills (TechSkill):	This pertains to specific skills required to use and integrate digital tools and technologies, such as programming or database management.	Sousa and Rocha (2019)
	Continuous Training (ConTrain):	This concerns the initiatives and opportunities provided by the SME for its employees to continuously enhance their digital skills.	North et al. (2019)
	Adaptability to Digital Tools (Adap):	This refers to the ability of the SME's employees to quickly adapt to new digital tools and technologies.	Thoumrunroje and Racela (2022)

Source: Own research

The Digital Transformation (DT) of an SME is influenced by the adoption of technology (Tech), and the digitization of processes (PDig). The equation for this relationship is:

$$TN = \lambda_1 \times \text{Tech} + \lambda_2 \times \text{PDig} \quad (1)$$

Here, λ_1 , λ_2 and λ_3 are the coefficients that represent the strength of the relationship between DT and each of its components (Tech, PDig, and IntT).

The governance of an SME (SMEG) is influenced by Digital Transformation (DT), Environmental Factors (EF), and Digital Skills (CN). The equation for this relationship is:

$$\text{GPME} = \theta_1 \times \text{TN} + \theta_2 \times \text{FE} + \theta_3 \times \text{CN} \quad (2)$$

Here, θ_1 , θ_2 and θ_3 are the coefficients that signify the strength of the relationship between SMEG and each of its influencing factors (DT, EF, and DS).

The Digital Skills (DS) of an SME are influenced by technical skills (TechSkill), continuous training (ConTrain), and adaptability to digital tools (Adap). The equation for this relationship is:

$$\text{DS} = \psi_1 \times \text{TechSkill} + \psi_2 \times \text{ConTrain} + \psi_3 \times \text{Adap} \quad (3)$$

Here, ψ_1 , ψ_2 and ψ_3 are the coefficients that indicate the strength of the relationship between DS and each of its components (TechSkill, ConTrain, and Adap). In these equations, the coefficients (λ , θ and ψ) represent the relative importance of each component in influencing the respective latent variable. These coefficients would typically be estimated from empirical data using structural equation modeling techniques.

4. RESULTS AND DISCUSSION

In this section, we outline the outcomes of our investigation centered on the influence of digital transformation on the governance of SMEs within Morocco's service sector. Ensuring the validity and consistency of the metrics utilized in this analysis was paramount, prompting us to adopt a systematic approach.

Table 2 presents the reliability and validity indicators for three main constructs: Digital Transformation (DT), Environmental Factors (EF), and SME Governance (SMEG). Four metrics are used to evaluate each construct: Cronbach's Alpha, rho_A, Composite Reliability, and Average Variance Extracted (AVE).

Cronbach's Alpha assesses the internal consistency, measuring the reliability of a set of scale or test items. Generally, a value above 0.7 indicates satisfactory consistency, suggesting that the items within the scale correlate well with each other. All constructs exceed this threshold. Specifically, SME Governance (SMEG) achieves the highest value at 0.937, while Environmental Factors (EF) have the lowest, though still respectable, value of 0.896. This underlines the strong internal consistency across all constructs.

Rho_A, commonly referred to as Dillon-Goldstein's Rho, offers another perspective on internal consistency. Values close to 1 indicate outstanding reliability. All constructs have rho_A values

above 0.9, emphasizing their high reliability. Both Digital Transformation (DT) and SME Governance (SMEG) are especially consistent, with values surpassing 0.93.

Composite Reliability (CR) measures the overall reliability of a group of related but distinct constructs. A value greater than 0.7 is considered satisfactory. All constructs exhibit excellent composite reliability, with SME Governance (SMEG) leading at 0.951. Environmental Factors (EF), although having the lowest value at 0.917, still show commendable reliability.

Average Variance Extracted (AVE) determines the amount of variance captured by a construct relative to measurement error. An AVE value higher than 0.5 is considered significant, indicating good convergent validity. Each construct meets or exceeds this standard. Digital Transformation (DT) has the top AVE at 0.800, implying that 80% of the variance in the observed variables relates to the underlying construct. Meanwhile, Environmental Factors (EF) have the lowest AVE but still surpass the suggested standard with a score of 0.649.

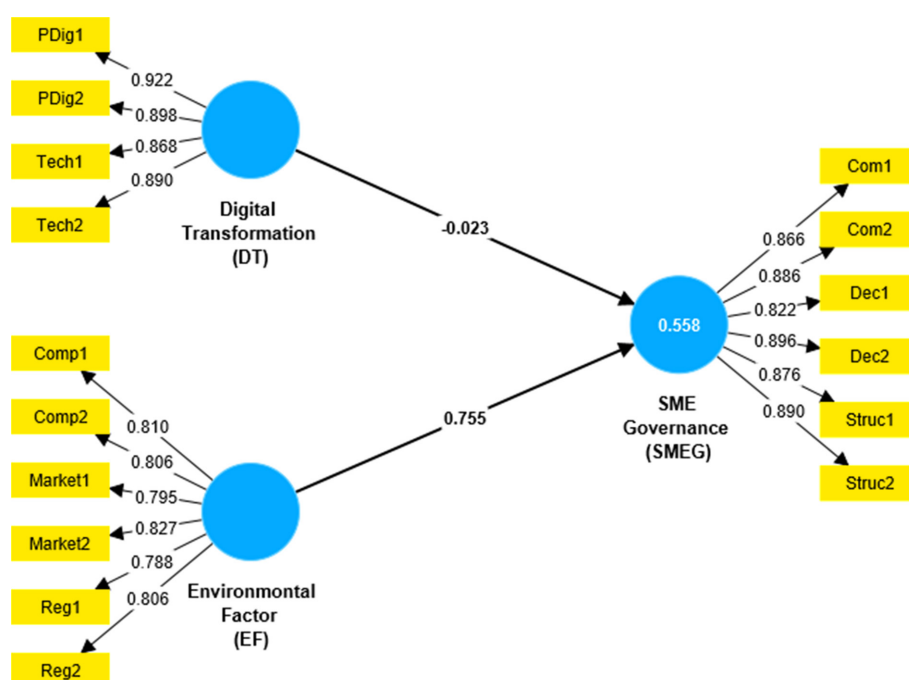


Figure 1. Path diagram model without mediator interaction

Source: Own calculations

Table 2. Reliability and validity indicators

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Digital Transformation (DT)	0,917	0,931	0,941	0,800
Environmental Factors (EF)	0,896	0,917	0,917	0,649
SME Governance (SMEG)	0,937	0,939	0,951	0,762

Source: Own calculations

Table 3 displays the results of the Fornell-Larcker criterion, a technique utilized to determine discriminant validity in structural equation modeling. Discriminant validity evaluates whether a construct is uniquely different from other constructs within the same model. By the Fornell-Larcker criterion's standards, a construct exhibits strong discriminant validity if the square root of its Average Variance Extracted (AVE) surpasses its correlations with other constructs.

The values on the leading diagonal indicate the square root of the AVE for each construct: 0.895 for Digital Transformation (DT), 0.806 for Environmental Factors (EF), and 0.873 for SME Governance (SMEG). These figures are pivotal in determining discriminant validity because they should be more significant than any other value in their respective row or column.

The off-diagonal values denote the correlations between constructs. For satisfactory discriminant validity, these numbers should be smaller than the diagonal values for their respective constructs. For example, the correlation between Digital Transformation (DT) and Environmental Factors (EF) stands at 0.363, less than the square root of AVE for both DT (0.895) and EF (0.806), indicating distinct validity between these constructs. In contrast, the correlation between Digital Transformation (DT) and SME Governance (SMEG) is 0.251, which is less than the square root of AVE for both DT (0.895) and SMEG (0.873), highlighting their distinct validity. However, a correlation of 0.747 exists between Environmental Factors (EF) and SME Governance (SMEG). Even though this number is smaller than the square root of AVE for SMEG (0.873), it closely approaches the AVE square root for EF (0.806). This closeness indicates that while EF and SMEG are distinct to some extent, there might be overlapping elements or shared facets between the two constructs.

Table 3. The Fornell-Larcker criterion

	Digital Transformation (DT)	Environmental Factors (EF)	SME Governance (SMEG)
Digital Transformation (DT)	0,895		
Environmental Factors (EF)	0,363	0,806	
SME Governance (SMEG)	0,251	0,747	0,873

Source: Own calculations

Table 4 showcases the evaluation results of the structural model, highlighting the relationships between Digital Skills (DS), Digital Transformation (DT), Environmental Factors (EF), and SME Governance (SMEG).

Table 4. Structural Model Evaluation Results

	Original Sample (O)	Standard Deviation	T Statistics	P Values
Digital Skills (CN) ► SME Governance (GPME)	0,133	0,045	2,974	0,003
Digital Transformation (TN) ► Digital Skills (CN)	0,125	0,081	1,54	0,124
Digital Transformation (TN) ► SME Governance (GPME)	-0,025	0,061	0,402	0,688
Environmental_Factor_(EF) ► SME_Governance_(SMEG)	0,714	0,047	15,278	0,000

Source: Own calculations

Beginning with the association between Digital Skills (DS) and SME Governance (SMEG), the data reveals a moderate positive relationship ($\beta = 0.133$; $t = 2.974$). This association's significance is underscored by the p-value of 0.003, suggesting that enhanced digital skills among employees correlate with improved SME Governance.

When examining the impact of Digital Transformation (DT) on Digital Skills (DS), the relationship appears relatively modest ($\beta = 0.125$). Given the t-value of 1.540 and a p-value of 0.124, this relationship isn't statistically significant. This suggests that while digital transformation might influence digital skills to some extent, its effect isn't pronounced enough to be deemed significant in this study.

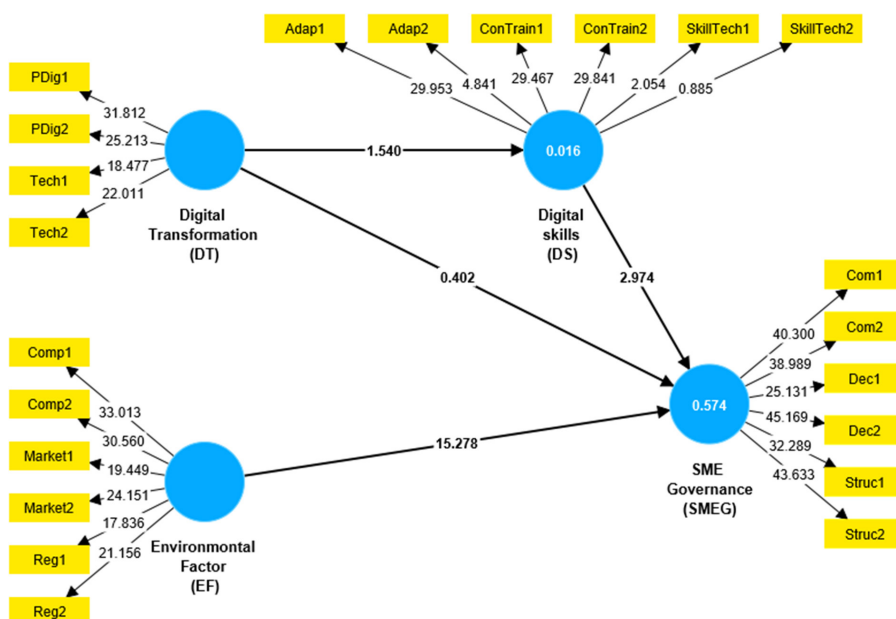


Figure 2. Path diagram model with mediator interaction

Source: Own calculations

Regarding the relationship between Digital Transformation (DT) and SME Governance (SMEG), the association is slightly negative ($\beta = -0.025$). However, with a t-value of 0.402 and a p-value of 0.688, this relationship isn't statistically significant. This implies that digital transformation may not have a marked direct effect on SME Governance in this dataset.

Lastly, a robust positive correlation is observed between Environmental Factors (EF) and SME Governance (SMEG) ($\beta = 0.714$; $t = 15.278$). The p-value of 0.000 affirms the statistical significance of this relationship. This indicates that environmental factors are instrumental in influencing SME Governance, emphasizing the importance of external factors and market dynamics in molding governance practices within SMEs.

Table 5. Bootstrapping Results for R2

	Original Sample	Standard Deviation	T Statistics	P Values
Digital Skills (DS)	0,016	0,022	0,692	0,489
SME Governance (SMEG)	0,574	0,050	11,412	0,000

Source: Own calculations

Table 5 showcases the bootstrapping results for the coefficient of determination (R2) related to the constructs of Digital Skills (DS) and SME Governance (SMEG). The R2 value provides a perspective on the variance explained by the endogenous constructs and stands as a key metric in gauging the model's predictive strength.

Examining the Digital Skills (DS), the R2 value is notably low at 0.016, suggesting that the model accounts for just 1.6% of the variance in Digital Skills. This assessment is further supported by a t-statistic value of 0.692 and a p-value of 0.489, indicating that the model's predictive accuracy for Digital Skills isn't statistically noteworthy. As a result, there may be additional external factors, not addressed in this model, that have a pronounced influence on digital skills.

Conversely, the R2 value for SME Governance (SMEG) is much more substantial at 0.574. This means that the model elucidates 57.4% of the variance in SME Governance, highlighting its

effective predictive performance for this construct. With a t-statistic of 11.412 and a p-value of 0.000, the data underscores the statistical significance of this relationship, reinforcing the model's reliability in forecasting SME Governance.

Table 6. Model Adjustment

	Original Sample (O)	Sample Mean (M)	95%	99%
Saturated Model	0,083	0,049	0,056	0,061
Estimated Model	0,103	0,058	0,080	0,108

Source: Own calculations

Table 6 delves into the model's alignment using two different frameworks: the saturated model and the estimated model. The key metric employed for assessment is the standardized root mean square residual (SRMR), which is instrumental in evaluating the congruence of the suggested model with the observed data.

Examining the saturated model first, the SRMR for the original sample stands at 0.083. This figure is beneath the widely recognized threshold of 0.10, signifying a satisfactory fit with the data. The sample mean (M) rests at 0.049, also indicating a favorable alignment. The confidence intervals for this model are 0.056 at 95% and 0.061 at 99%, implying that the SRMR values for this model remain consistent and within recognized boundaries.

Turning to the estimated model, the SRMR for the original sample is marginally elevated at 0.103. Although this measurement surpasses the desired threshold of 0.10, it conveys a modest alignment with the data. The sample mean (M) for this model measures 0.058, akin to the saturated model, signaling an acceptable alignment. The 95% confidence interval settles at 0.080, while the 99% confidence interval reaches 0.108. These ranges are broader relative to the saturated model, indicating increased variability in the estimated model's alignment.

In juxtaposition, both models showcase SRMR values reflective of decent alignments with the data. Yet, the saturated model, accommodating all conceivable correlations among the constructs, seems more harmonized with the observed data. In contrast, the estimated model, grounded in the postulated model structure, exhibits some deviations, notably with its SRMR value marginally exceeding the 0.10 benchmark. This observation infers that while both models align reasonably with the data, the saturated model offers a more harmonious fit, but there's potential for refining both frameworks.

5. CONCLUSION

In today's dynamic business environment, the digital era presents a myriad of challenges and opportunities for businesses around the world. The term "digital transformation" is frequently used in modern discussions, but it demands a more profound comprehension, particularly when exploring its direct effects on SMEs. This article aimed to uncover the nuances of digital transformation and its impact on the governance of SMEs, particularly within the thriving service sector of Morocco. Our investigation revealed that digital transformation goes beyond just the introduction of technology; it signifies an organizational shift with the potential to reshape governance frameworks and strategies within SMEs.

The insights from our study are twofold. On one side, digital transformation offers opportunities for improved governance in SMEs. On the other, its success depends on multiple factors. Key among these are external elements like market trends and regulatory structures that have

significant influence. Moreover, expertise in digital domains can act as a bridge, connecting digital transformation to effective governance. While some of our hypotheses received strong empirical support, others highlighted areas ripe for further investigation and understanding.

Focusing on the Moroccan service sector, it's evident that SMEs need to be proactive in their approach to digital transformation. It shouldn't be viewed merely as a tool, but as a strategic imperative. In this context, proficient governance, guided by digitization, can evolve into a powerful competitive asset, enabling SMEs to excel in a fluctuating market landscape.

Expanding the scope, even though our research provides keen insights into the Moroccan context, the broader implications of its findings are globally relevant. This emphasizes the global nature of the digital transformation story. As SMEs navigate the digital waters, a deeper understanding of its influence on governance becomes increasingly vital. Looking ahead, there's a call for more research, especially examining the dynamics between external factors and digital expertise in diverse cultural and economic environments. Such endeavors can further enhance the discourse on digital transformation and its implications for organizations.

Validation of Hypotheses: The data indicates that the supposed direct positive impact of digital transformation on SME governance, as stated, is not confirmed. The data strongly supports the assertion, underscoring the significant role of external factors in determining the effects of digital transformation on SME governance. The hypothesis receives mixed support from the data. While digital skills play an essential role in influencing SME governance, the mediating relationship between digital transformation and these skills isn't decisively established.

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