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Leveraging Social Media to Enhance Digital Innovation Process and Innovation Performance in Jordanian SMEs

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Abstract. This study analyzed the linkages between social media (SM) usage, digital innovation processes, and innovation performance in 559 Jordanian SMEs. Using PLS-SEM analysis of survey data, results showed SM usage positively impacts innovation performance both directly (β=0.365) and indirectly (β=0.340) through enhanced digital innovation processes. The digital innovation process is found to partially mediate the SM usage-innovation performance relationship. The findings imply that SM usage assists SMEs in idea generation, experimentation, and implementation stages to improve revenues from new products and services. By leveraging SM to connect with customers, suppliers, and competitors, SME managers can drive greater business innovation success.

Keywords: Social Media, Digital Innovation, Innovation Performance, Innovation Process, SMEs, Emerging Economies, Developing Countries, Jordan.

1. Introduction

In today's fiercely competitive and dynamic business environment, the integration of social media (SM), digitalization, and innovation stands as imperative for firms' survival. Innovation is recognized as a critical driving force for businesses to achieve success, a superior global competitive position, and a competitive advantage (Foster et al., 2023; Rosenzweig, 2017). In recent years, digital communication and technology have played growing roles in fostering innovation (Gaglio et al., 2022). The nexus between digitalization and innovation is increasingly becoming an important research topic (Li et al., 2023; Dahlman et al., 2016). However, it is important to note that digital communication encompasses various IT innovations. SM platforms represent one of the most recent forms of ICT that involve active content creation by users and members (Kaplan & Haenlein, 2010) and have become a standard and an essential technology input in every business regardless of its type and size (Alalawneh et al., 2022b). SM diffusion presents new opportunities for many sectors and affects the behavior and processes of firms (Troise et al., 2022).

Given their interactive nature, SM platforms are rapidly being used and have opened numerous sources of innovation (Ioanid et al., 2018; Dong & Wu, 2015). SM primarily enhances firms' communication, collaboration, consumption, business functions, and activities (Aral et al., 2013; Caloghirou et al., 2004). Studies have shown that linking firms with external sources of information, such as customer involvement, involvement of alliances, suppliers, outside consultants, and competitors, has a positive effect on the innovation process (Love and Mansury, 2007). Leveraging SM can support innovation by enabling more interaction with external sources to generate ideas and feedback for new products, understanding the firm environment, reaching new individuals interested in innovation efforts, and introducing and promoting innovation outcomes and capabilities (Lindegaard, 2012).

Small and Medium Enterprises (SMEs) are central mechanisms of many countries in the world (Wardati & Mahendrawathi, 2019); they contribute to job creation, regional development, and innovation activities and positively support the country's economic rank (Shemi & Procter, 2018). The digitalization race has sharpened the demand for SMEs to use digital technology (Ghobakhloo & Iranmanesh, 2021; Maroufkhani et al., 2022). There is a strong desire to adopt innovative technology to grow and remain competitive under limited resources (Maroufkhani et al., 2022). Digitalization provides superb tools for SMEs and entrepreneurs to stand out in the market and grow effectively (Ghobakhloo & Iranmanesh, 2021; Maroufkhani et al., 2022; Richter et al., 2017).

Research on digital innovation in SMEs has predominantly focused on adoption issues and their outcomes (Ramdani et al., 2022; Alalawneh et al., 2022a). Moreover, empirical evidence suggests that SMEs in developing countries lag behind those in developed countries (Cataldo et al., 2020). Furthermore, in the context of SMEs and digital innovation, SM has been examined in limited studies (Ramdani et al., 2022). Papa et al. (2018) stated that there is still a gap, at least through quantitative methods, concerning the role of SM as a new ICT that fosters innovation. Despite empirical research exploring the changes in innovation dynamics triggered by SM, the benefits of leveraging SM to acquire the knowledge needed for innovation activities still need to be explored (Papa et al., 2018).

While the role of SM in innovation has been well-addressed in the literature (Bhimani et al., 2019; Brandtzaeg & Følstad, 2016; Hitchen et al., 2017), most previous studies have focused on investigating the direct link between SM and innovation performance (Hensen & Dong, 2020) without considering the mediating role of the innovation process in this relationship. He and Wang (2016) noted that limited investigations have been conducted on the impact of SM on innovation processes. Similarly, Dong and Yang (2020) asserted that few empirical studies have examined the relationship between IT innovations, such as SM, and the innovation process. Studies have shown the importance of SM usage and its impact on the innovation process (Dong & Yang, 2020; He and Wang, 2016). The innovation process and its mediating role between SM usage and innovation performance have yet to be considered. There is little empirical evidence in the literature, and more studies are needed. An in-depth understanding of how information mechanisms interact with innovation processes would positively improve the success of

organizations is needed (Foster et al., 2023). Consequently, this study aims to bridge the existing gap in the literature and shed light on the role that digital innovation processes play in the relationship between SM usage and innovation performance in the context of SMEs in Jordan as a developing country. The study's objectives are twofold; firstly, to examine the impact of SM usage on SMEs' innovation performance, and secondly, to investigate the mediating impact of the digital innovation process on the relationship between SM usage and innovation performance.

2. Literature Review

2.1. Social Media and Innovation in SMEs

SM platforms are increasingly adopted by SMEs (Alhaimer, 2021; Papa et al., 2018; Roberts & Piller, 2016), and they become a strategic resource to reach and interact with many customers and realize opportunities compared with traditional mass media networks (Gümüş & Kütahyali, 2017). SMEs seek to take advantage of SM platforms, which has led to a paradigm shift in innovation and changed the nature of innovation itself (Ramdani et al., 2022; Ciriello et al., 2018). SM creates a dynamic ecosystem for innovation and growth (Gnyawali et al., 2010), helps firms to improve innovation processes (Archer-Brown & Kietzmann, 2018), encourages connectivity among individuals (Garcia-Morales et al., 2018), and enables employees to learn faster and better (Ellison et al., 2015). Currently, SM has become a necessity for SMEs. Nonetheless, studies on innovation in the context of SMEs in developing countries are scarce (Ortigueria–Sanchez et al., 2022). Several studies have examined the impact of SM usage on organizational innovation performance. However, innovation performance has been measured using various approaches. For instance, Pérez-González et al. (2017) investigated the impact of SM technologies on industrial SMEs' innovation performance using four innovation performance measures such as new products and services. Al-Tal and Emeagwali (2019) used the new product and process concept to measure innovation performance, while Haug et al. (2023) focused on product innovation as a direct measure of innovation performance. In addition, Soto-Acosta et al. (2016) focused on organizational innovation through the number of new/improved products, product lines and processes, top management support for research and development, and the significance of these new changes. Sun and Liu (2023) examined the effects of SM usage on new product development. Regardless of the different approaches used to measure innovation performance, some studies have reported a positive impact of SM usage (Teh et al., 2021; Meidute-Kavaliauskiene et al.,2021; Ali et al., 2020; Hanifah et al., 2020; Muninger et al, 2019; and He and Wang 2016) whereas others have found a negative or insignificant impact (Roberts & Candi, 2014; Marion et al., 2014; Roberts et al., 2016). According to Sun and Liu (2023), the negative or insignificant impact can be attributed to the failure to explore the mediators that explain the relationship between SM usage and organizational innovation performance.

2.2. Digital Innovation Process

The innovation process can be viewed from two perspectives (Urbinati et al., 2023): digitally transformed and non-digital (traditional) innovation processes. Several aspects distinguish these processes: the nature of the process, collaboration mechanisms, capabilities, and the learning process. According to Ghezzi and Cavallo (2020), digital innovation consists of several phases that facilitate continuous stakeholder collaboration and engagement through new ways. Meanwhile, Marion and Fixson (2021) argued that the digital innovation process allows firms to implement new knowledge management approaches of sharing, creating, deploying, and absorbing. According to Ciriello et al. (2018), innovating digitally means "*innovating products, services, and business models using digital technology platforms as a means or end within and across organizations*" (Ciriello et al., 2018, p.564). Fichman et al. (2014, p.330) defined digital innovation as "*the product, process, or business model that is perceived as new requires some significant changes on the part of an adopter, and is embodied in or enabled by IT*."

Traditionally, SMEs have tended to resist innovation and consider it a risk that requires significant knowledge (Garcia-Morales et al., 2018). Many firms are investing in ICT applications and SM platforms because of the expected benefits of engaging stakeholders in innovation processes (Bhatti et al., 2021). Stakeholders' involvement in innovation processes and how firms interact, collaborate, and exchange value with their customers have transformed due to digitalization and advancements in ICT (Bhatti et al., 2021; Garrido-Moreno et al., 2020). Garcia-Morales et al. (2018) argue that, when it comes to radical innovation (which changes both the components and their interaction to create a unique new solution), SMEs may be more capable than large firms. This can be attributed to the exceptional wave of digitalization led by SM, which is fueling innovation globally (Bhatti et al., 2021) because SM adoption provides a productive open environment that supports the innovation process (Bhatti et al., 2021) by facilitating the creation and exchange of information among its users (Kaplan & Haenlein, 2010). SM can improve all of the innovation process stages by obtaining, sharing, and exchanging knowledge and expertise and acquiring feedback, reactions, and suggestions from stakeholders (Roberts & Piller, 2016; He and Wang, 2016). However, limited attention has been paid to innovation processes (He and Wang, 2016). Hussein et al. (2020) acknowledged that only some studies have examined the use of IT in the innovation process and performance. Little is known about the usage of SM among SMEs and their impact on creating and adding value to products and services or new product development (Bashir et al., 2017). Thus, very few studies have explored the role of SM usage on innovation performance through the innovation process.

2.3. Hypotheses Development

The direct impact

The external use of SM for innovation purposes is valuable for SMEs (Alalawneh et al., 2022a). Studies on SM usage with external sources for innovation are limited, and there is still a need for more empirical studies (Ioanid et al., 2018; Itani et al., 2017). In this research, the three main participants considered key sources of information and knowledge for the innovation process are customers, competitors, and suppliers. Regarding customers, SMEs widely and rapidly adapt SM platforms (Scuotto et al., 2017). They are considered an essential tool for SMEs to communicate, interact, and collect ideas and opinions of customers (Meske & Stieglitz, 2013) and to be aware of their preferences and needs (Papa et al., 2018; Scuotto et al., 2017). SM provides many opportunities and an outstanding channel for customers to give their opinions and engage and participate in product and process innovation projects (Roblek et al., 2013). In addition, SM is an inexpensive medium that overcomes traditional media barriers, risks, and limitations and can reach many potential customers with rich content (text, videos, pictures, and live interactions) (Roblek et al., 2013).

Moreover, SM supports innovation by enhancing interaction and knowledge exchange between firms and consumers (Gaglioa et al., 2022). Moilanen et al. (2014) reported that good collaboration, knowledge sharing, and feedback acquisition from customers significantly impact innovation performance. In their investigation of SM usage and innovation, Roberts and Candi (2014) find a positive impact of SM websites for collaboration with customers and innovativeness. Pérez-Gonzáleza et al. (2017) argued that using SM platforms to collect customer information positively impacts the innovation performance of industrial SMEs. Likewise, Bertschek and Kesler (2017) reported that SMEs' use of Facebook and its feedback tools significantly impact product innovation. Finally, Gaglioa et al. (2022) found that digital communication technologies, including SM, positively impacted product and process innovation and concluded that SM encourages interactions and the exchange of knowledge with consumers in all SME types. In terms of competitors, previous studies have indicated that SM can be used to collect information about them (Pérez-González et al., 2017; Scuotto et al., 2016). Due to the increasing use of SM as an essential source of announcing information can be used as an intelligence tool to monitor competitors, their actions, products and services, customers' impressions and reactions, feedback, and comments (Venkateswaran et al., 2019). According to the study by Pérez-Gonzáleza et

al. (2017), there is a positive relationship between using SM technologies to acquire competitors' information and innovation performance in industrial SMEs.

Suppliers are one of the primary and most robust external sources of innovation (Qualman, 2012; Henke & Zhang, 2010; Love & Mansury, 2007) and are considered a key source of ideas, suggestions, and feedback (Fossass-Olalla et al., 2010). Additionally, they contribute to innovation in various forms, including supply innovation components, product or process technology, and joint product development (Fossass-Olalla et al., 2010). Innovation can be cooperatively developed with suppliers and commercialized by improving the quality of inputs and reducing costs (Kim et al., 2003). A study conducted by Ioanid et al. (2018) based on the answers of entrepreneurs and managers of manufacturing SMEs showed that 15% of the overall innovation process can be attributed to the impact of suppliers. Therefore, firms can use different SM platforms as information sources to find new collaborative relationships with suppliers and to develop innovation (Mitrega et al., 2017). Additionally, SM platforms can be used as information sources for suppliers' innovation capabilities and to develop product and process innovations (Tóth et al., 2019). Du et al. (2016) mentioned that suppliers are a fruitful source of ideas, information, and knowledge. SM can be seen as an appropriate source for sharing knowledge and information between an organization and its suppliers. Finally, SM has opened opportunities for suppliers to participate and share product and process information (Hitchen also et al., 2017; Zimmermann et al., 2016; Ylimaula, 2013) and allows the sharing of new knowledge in a continuous base about customers' needs and decision-making approaches (Schoenherr & Wagner, 2016; Irani et al., 2017). Accordingly, we propose the following hypothesis:

H1: External usage of SM platforms is positively and directly associated with SMEs' innovation performance.

The indirect impact

The digital innovation process involves increasing automation for businesses to speed up processes and react faster to internal and external changes. SM can improve all stages of the innovation process by obtaining and sharing knowledge, exchanging expertise, and acquiring feedback and suggestions from customers and their reactions (Roberts & Piller, 2016); He and Wang (2016). Previous studies support the positive impact of SM adoption on innovation processes and performance (Meidute-Kavaliauskiene et al., 2021; The et al., 2021; Ali et al., 2020; Hanifah et al., 2020; Muninger et al., 2019; and He and Wang 2016). However, they independently investigated the impact of SM adoption on innovation processes and innovation performance. Other studies investigated the indirect impact of SM usage on innovation performance. For example, Odoom and Mensah (2019) investigated the moderating role of SM and innovation capabilities on the relationship between brand orientation and performance. However, limited attention has been paid to innovation processes (He and Wang, 2016). During the COVID-19 pandemic, Rakshit et al. (2021) found that using SM is a vital source of information and knowledge for SMEs' new product development (NPD) process. Consideration of the mediators that transfer the impact of SM usage on NPD innovation performance is critical; however, empirical examinations of such processes remain scarce (Testa et al., 2020). Similarly, studies on the effect of SM usage on the stages of the innovation process (various stages of NPD) are still scarce, and more investigations are needed (Sun & Liu, 2023; Muninger et al., 2019)

SM is beneficial and valuable in the innovation process and enhances all its stages (Muninger et al., 2019). Mulibana and Rena (2022) conducted a study to understand the innovation process of informal micro-enterprises and how to obtain the required knowledge to perform innovation activity. They found that 33% (7 of 21) of the participants acquired knowledge and information through SM and news platforms. They also found that 29% (6 of 21) of the participants used SM platforms to market their innovations. Scholars have also recognized that informal micro-enterprises depend on SM to access needed information and knowledge for innovation. Nambisan et al. (2017) argue that due to the broad

use of digital technology and its impact on the innovation process and performance, more investigations are needed to understand the combination of innovation management and digital technology and how SMEs utilize digital technology to improve innovation processes and performance. The effects of SM on the digital innovation process and innovation performance are still limited, and more studies are needed (Ramdani et al., 2022). Furthermore, studies on the impact of SM on the innovation process are limited and conceptual (Ramdani et al., 2022; Nambisan et al., 2017). Therefore, we propose the following hypotheses:

H2: The digital innovation process positively mediates the relationship between the external usage of SM platforms and SMEs' innovation performance.

There is little empirical evidence in the literature about the mediating role of innovation process between SM usage and innovation performance. Consequently, this study aims to bridge the existing gap in the literature and extends the existing research on the digital innovation processes, SM usage and innovation performance interactions in the context of SMEs in Jordan as one of the developing countries. Based on previous studies (Foster et al., 2023; Ramdani et al., 2022; Mulibana and Rena, 2022; Testa et al., 2020), this study examines the linkages among the external usage of SM platforms, the digital innovation process, and innovation performance within the SME sector in Jordan. Figure (1) illustrates the proposed model.

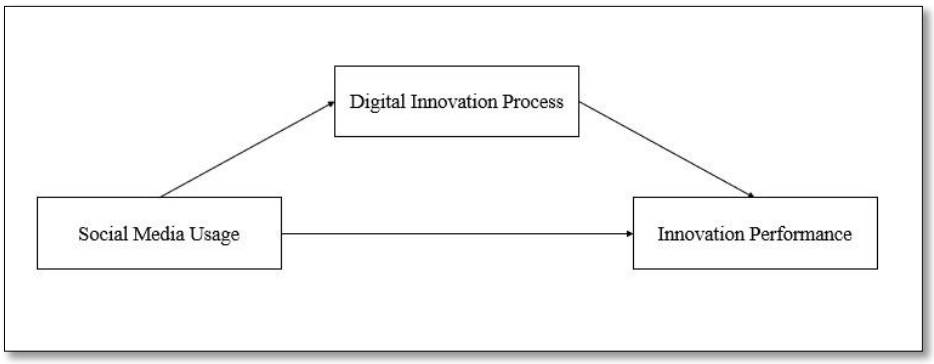

Fig.1: The proposed research models.

3. Research Methodology

A quantitative research approach, using a structured questionnaire, was used to gather information. Based on the research objectives, model, and hypotheses, a structured equation modeling (SEM) approach using partial least squares (PLS-SEM) was applied to test the research hypotheses since it is considered more appropriate when complex models are analyzed and when higher-order constructs facilitate better understanding of theoretical models (Hair and Alamer, 2022).

3.1. Population and Sampling

This study analyzes the external use of SM platforms, digital innovation process, and innovation performance interaction within Jordanian SMEs. In this study, an SME refers to a business employes fewer than 50 individuals, according to the Central Bank of Jordan (CBJ, 2023). The questionnaire targeted the owners/managers of Jordanian SMEs operating within the textile and readymade clothes as well as the food and beverages sectors due to their substantial size and influence. For instance, there are more than 20,000 restaurants in Jordan employing more than 100,000 individuals (URCPJO), while the textile and readymade clothes industry comprises more than 12,000 establishment employing around 60,000 workers (TSCJO). The study focused on SMEs situated in two densely populated cities: Amman and Irbid. These SMEs were purposively selected based on their active presence on SM platforms. Over

700 questionnaires were electronically distributed, a total of 559 questionnaires were completed and valid for analysis. The overall response rate was 79%.

3.2. Data Collection Tool and Measurements

The questionnaire consisted of two sections. The first one evaluates the general profiles of respondents and SMEs. The second one included 26 items to measure the model constructs. All items are measured on a five-point Likert scale anchored with "1 = strongly disagree" to "5 = strongly agree". Sixteen items were adapted from Pérez-González et al. (2017) and Cheng and Krumwiede (2018) and used to assess the extent to which SMEs acquire information from customers, suppliers, and competitors. The digital Innovation process was assessed by incorporating SM in the innovation process stages: idea generation, idea screening, idea experimentation, idea commercialization, and idea implementation. Five items were adapted from Muninger et al. (2019) and used to measure the digital innovation process. Innovation performance was measured using five adopted items from Perez-Gonzalez et al. (2017) and Haug et al. (2023). These items included the number of new/improved products or services, new/improved processes, new/improved management practices, new/improved marketing methods, and revenue from new/improved products. Before distributing the questionnaire, three professors and three SME managers evaluated it. Based on their feedback, comments, and suggestions, the questionnaire was revised, modified, and rephrased for clarity and simplicity.

4. Data Analysis

A variance-based structural equation modeling (SEM) technique was used to verify the present study's proposed model and research hypotheses. According to Sarstedt et al. (2019), partial least squares structural equation modeling (PLS-SEM) has become more widespread. It has attracted much attention in business research as a composite-based method for modeling complex interrelationships between observed and latent variables. Hair et al. (2017) stated that SEM benefits many research questions and has become a quasi-standard for analyzing cause-effect relationships between latent variables. In addition, variance-based structural equation modeling techniques allow simultaneous analysis of both measurement and structural models. PLS-SEM is preferred in the exploratory stage, as in this study, while covariance-based structural equation modeling (CB-SEM) tests existing theories (Hair et al., 2017; & 2011). Furthermore, the method is considered suitable for simultaneously predicting a group of equations for the proposed research model and further developing the relationships between variables (Davari & Rezazadeh, 2013). Therefore, PLS-SEM was used in this study with Smart PLS V4 (Ringle et al., 2022).

4.1. Descriptive Analysis

The analysis shows that 228 SEMs out of 559 operate within the textile and readymade clothes industry, while 331 SMEs operate within the food and beverages industry. Among the surveyed SMEs, 280 reported using more than two social media platforms, with Facebook and Instagram ranking the leading platforms of SMEs' choice. The analysis also shows that 81% of the surveyed SMEs are owned/managed by males and 19% by females, the majority are considered young and aged between (less than 30) and (30 to 40), with a minimum of (5-10) years of experience.

4.2. Social Media Usage as a Higher-Order Construct

In PLS-SEM, higher-order constructs (HOC) or the hierarchical component models (HCM) extend standard construct conceptualizations and provide a framework to model a construct on a more abstract dimension (HOC) that are more concrete ones, which are known as lower-order constructs (LOC) (Sarstedt et al., 2019). HOCs have several advantages, such as reducing the number of path model relationships, overcoming the bandwidth-fidelity dilemma, and reducing collinearity among formative indicators (Sarstedt et al., 2019). This study is based on a reflective-reflective HCM that indicates a reflective relationship between SM usage as a HOC and SM usage for customers, suppliers, and

competitors as the LOCs, which are measured by reflective indicators (Alalawneh et al., 2022b). Different approaches can be used to identify the HOC. According to Sarstedt et al. (2019), the repeated indicators and two-stage approaches are prominent. In this study, the number of indicators across the LOCs varied, which could lead to a biased relationship between the HOC and LOCs (Hair et al., 2017). To overcome this issue, a two-stage approach is used to model the SM usage as an HOC. The embedded two-stage approach (Ringle et al., 2012) and the disjoint two-stage approach (Agarwal & Karahanna, 2000; Becker et al., 2012) are two proposed versions that differ slightly in their specifications in both stages (Sarstedt et al., 2019). We followed the disjoint two-stage approach in this study since both approaches lead to similar results, and as stated by Sarstedt et al., "*there is no compelling reason for preferring one over the other*" (2019, p.3). In the first stage, a model is created by connecting all LOCs directly to all other constructs to which the HOC is related (Figure 2), and then the LOCs scores are saved and used in stage two to measure the HOC (Sarstedt et al., 2019).

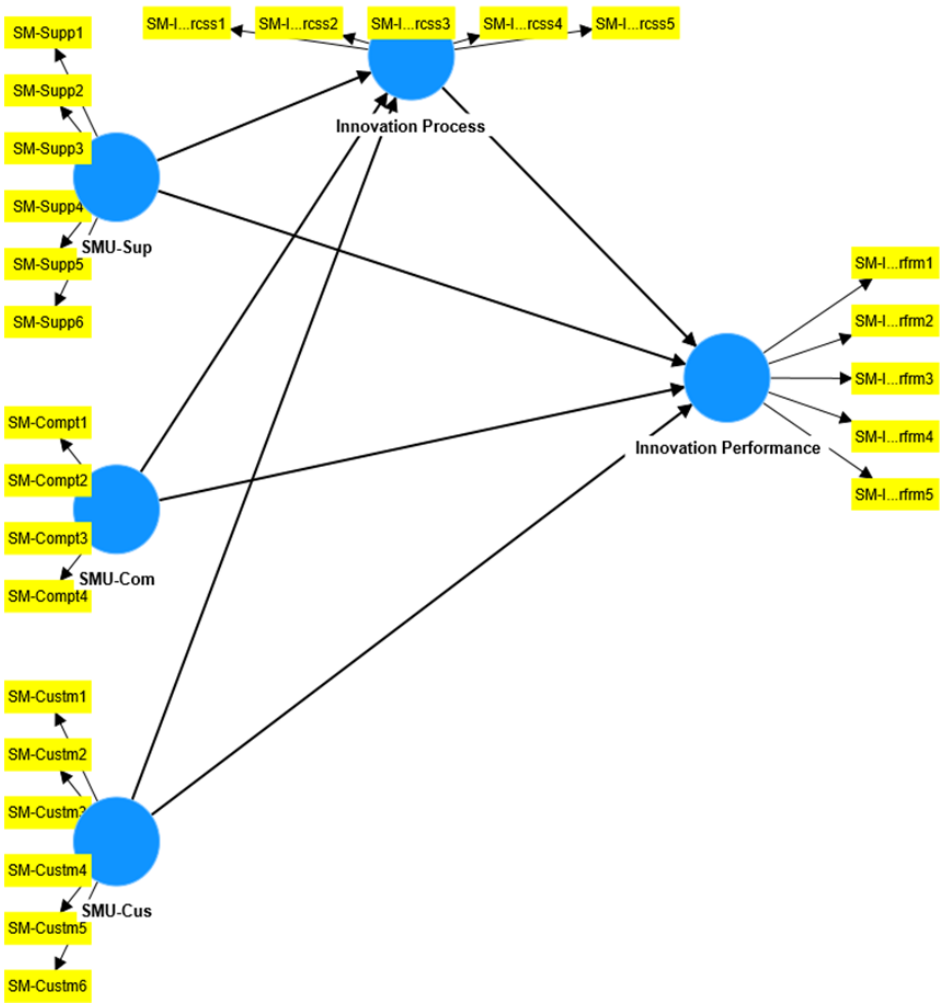

Fig. 2: The measurement model – Stage one

4.3. Reliability and validity

The measurement quality of the stage-one model was verified by examining internal consistency, convergent validity, and discriminant validity, as Sarstedt et al. (2019) recommended. The convergent validity was assessed by examining the reliability of each item. Convergent validity requires an indicator's loading to be 0.6 or higher (Bagozzi & Yi, 1988). In our study, all indicator loadings were

higher than 0.6 and met the minimum acceptable level, as shown in Table (1). Furthermore, each construct's average variance extracted (AVE) value indicated satisfactory reliability and convergent validity (more significant than the 0.5 thresholds recommended by Fornell and Larcker, 1981; Chin, 1998).

Table. 1: Summary Results for Measurement Model-Stage One Quality

Latent Variable	Indicators	Loadings	CR	AVE
SM usage-Suppliers			0.970	0.845
	SM-Supp1	0.962		
	SM-Supp2	0.914		
	SM-Supp3	0.948		
	SM-Supp4	0.891		
	SM-Supp5	0.884		
	SM-Supp6	0.913		
SM usage-Competitors			0.958	0.852
	SM-Comp1	0.916		
	SM-Comp2	0.945		
	SM-Comp3	0.926		
	SM-Comp4	0.905		
SM usage-Customers			0.980	0.889
	SM-Cust1	0.970		
	SM-Cust2	0.907		
	SM-Cust3	0.952		
	SM-Cust4	0.942		
	SM-Cust5	0.946		
	SM-Cust6	0.939		
Innovation Performance			0.951	0.796
	InvoPrfrm1	0.908		
	InvoPrfrm2	0.925		
	InvoPrfrm3	0.908		
	InvoPrfrm4	0.888		
	InvoPrfrm5	0.829		
Innovation Process			0.975	0.887
	InvoPrcss1	0.919		
	InvoPrcss2	0.955		
	InvoPrcss3	0.952		
	InvoPrcss4	0.944		
	InvoPrcss5	0.938		

Supp: Supplier; Cust: Customers; Comp: Competitors; InvoPrfrm: Innovation performance; InvoPrcss: Innovation process.

Discriminant validity has been used to assess how much each construct differs from other constructs. Different criteria were used to assess discriminant validity. The first criterion is the cross-loading matrix criterion (Chin (1998). All items loaded well onto their corresponding constructs and were more heavily loaded than others, as shown in Table (2).

Table. 2: Loading (**bold**) and cross loading

	SM usage-Suppliers	SM usage-Competitors	SM usage-Customers	Innovation Performance	Innovation Process
SM-Supp1	**0.962**	0.555	0.729	0.637	0.602
SM-Supp2	**0.914**	0.521	0.680	0.591	0.548
SM-Supp3	**0.948**	0.549	0.733	0.619	0.616
SM-Supp4	**0.891**	0.528	0.627	0.548	0.513
SM-Supp5	**0.884**	0.516	0.669	0.566	0.563
SM-Supp6	**0.913**	0.488	0.670	0.607	0.550
SM-Comp1	0.540	**0.916**	0.481	0.471	0.460
SM-Comp2	0.523	**0.945**	0.486	0.449	0.451
SM-Comp3	0.515	**0.926**	0.483	0.451	0.462
SM-Comp4	0.535	**0.905**	0.488	0.453	0.442
SM-Cust1	0.718	0.503	**0.970**	0.627	0.658
SM-Cust2	0.701	0.496	**0.907**	0.629	0.638
SM-Cust3	0.699	0.497	**0.952**	0.627	0.668
SM-Cust4	0.726	0.508	**0.942**	0.631	0.658
SM-Cust5	0.681	0.479	**0.946**	0.622	0.652
SM-Cust6	0.696	0.483	**0.939**	0.617	0.634
InvoPrfrm1	0.610	0.450	0.630	**0.908**	0.670
InvoPrfrm2	0.645	0.452	0.665	**0.925**	0.700
InvoPrfrm3	0.592	0.415	0.611	**0.908**	0.649
InvoPrfrm4	0.560	0.447	0.562	**0.888**	0.680
InvoPrfrm5	0.468	0.444	0.476	**0.829**	0.595
InvoPrcss1	0.559	0.480	0.634	0.698	**0.919**
InvoPrcss2	0.595	0.485	0.652	0.712	**0.955**
InvoPrcss3	0.589	0.462	0.643	0.696	**0.952**
InvoPrcss4	0.583	0.440	0.670	0.697	**0.944**
InvoPrcss5	0.576	0.449	0.656	0.680	**0.938**

Supp: Supplier; Cust: Customers; Comp: Competitors; InvoPrfrm: Innovation performance; InvoPrcss: Innovation process.

The second criterion was the square root of the AVE value for each factor that should be higher than the correlations with all other factors (Fornell & Larcker, 1981). The diagonal values in Table (3) represent the square root of the AVEs, which are more significant than their off-diagonal values in all cases.

Table. 3: Construct Correlation Matrix

	Innovation Performance	Innovation Process	SM usage-Competitors	SM usage-Customers	SM usage-Suppliers
Innovation Performance	**0.892**				
Innovation Process	0.740	**0.942**			
SM usage- Competitors	0.494	0.492	**0.923**		
SM usage-Customers	0.663	0.691	0.525	**0.943**	
SM usage- Suppliers	0.648	0.616	0.573	0.746	**0.919**

The third criterion was the HeteroTrait–MonoTrait ratio (HTMT), where the confidence interval of HTMT statistics should not include the value (1.00) for all combinations of constructs (Hair et al., 2017). Table (4) shows that the values of the HTMT ratio were lower than 0.80. Therefore, the discriminant validity of the scale was supported.

Table. 4: Heterotrait–monotrait ratio (HTMT)

	Innovation Performance	Innovation Process	SM usage-Competitors	SM usage-Customers	SM usage-Suppliers
Innovation Performance					
Innovation Process	0.776				
SM usage-Competitors	0.527	0.515			
SM usage-Customers	0.691	0.712	0.547		
SM usage-Suppliers	0.679	0.637	0.601	0.769	

Additionally, Composite reliability (CR) was extracted for each construct. A (0.7) threshold recommended by Chin (2010) has been used. All the CR measures were more significant than the threshold. Thus, internal consistency was met.

4.4. The Measurement Model- Stage Two

The latent variable scores for the LOCs (SMU-Suppliers et al.) obtained from stage one were saved to serve as manifest variables in the HOC measurement model in stage two (Hair et al., 2017; Sarstedt et al., 2019), as shown in Figure (3).

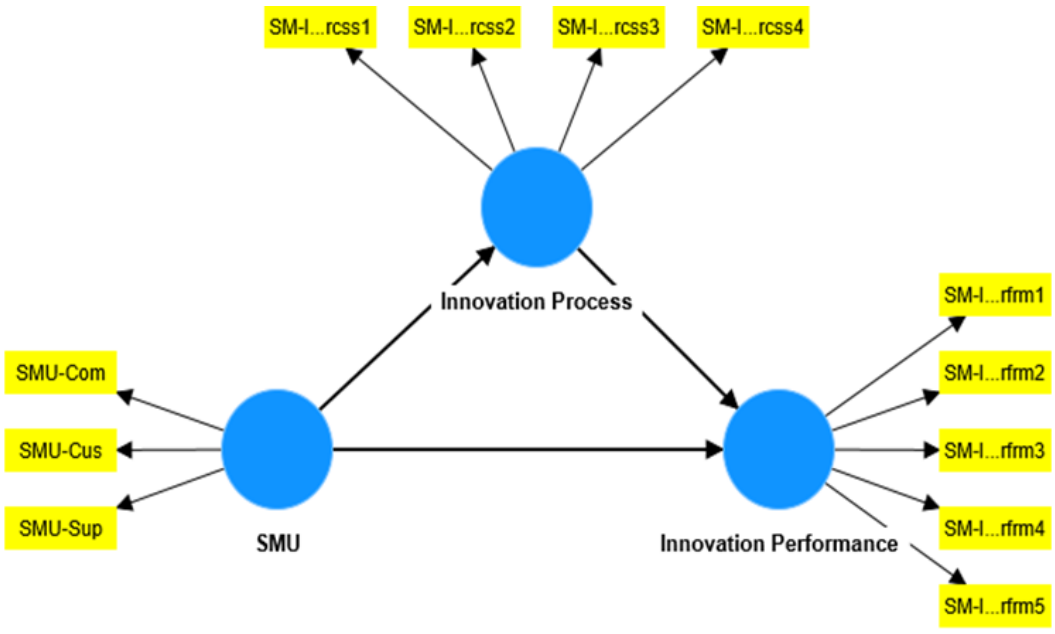

Fig. 3: The measurement model – Stage two

Following the same steps conducted in stage one, several statistics were employed to examine the convergent validity, internal consistency, and discriminant validity as suggested by Hair et al., (2019) and shown in table (5) below. The reliability of each item was examined to assess the convergent validity. According to Bagozzi and Yi (1988), convergent validity requires indicator's loading to be 0.6 or higher.

Items loadings of the current study ranged from 0.774 to 0.955 indicating that the scale has acceptable internal reliability. In addition, Cronbach's alpha (α) values ranged from 0.827 to 0.968. The average variance extracted (AVE) was determined for each construct and the values were greater than the 0.5 threshold as recommended by Fornell and Larcker (1981) and Chin (1998) which indicates satisfactory reliability and convergent validity. Furthermore, the results indicate that all CR measures were greater than the 0.7 threshold as recommended by Chin (2010). Thus, the internal consistency was met.

Table. 5: Summary Results for Measurement Model-Stage One Quality

Latent Variable	Indicators	Loadings	α	CR	AVE
SMU			0.827	0.897	0.744
	SMU-Sup	0.908			
	SMU-Cus	0.900			
	SMU-Com	0.774			
Innovation Performance			0.936	0.951	0.796
	InvoPrfrm1	0.908			
	InvoPrfrm2	0.924			
	InvoPrfrm3	0.908			
	InvoPrfrm4	0.888			
	InvoPrfrm5	0.830			
Innovation Process			0.968	0.975	0.887
	InvoPrcss1	0.919			
	InvoPrcss2	0.955			
	InvoPrcss3	0.952			
	InvoPrcss4	0.944			
	InvoPrcss5	0.938			

SMU: Social media usage; Sup: Supplier; Cus: Customers; Com: Competitors; InvoPrfrm: Innovation performance; InvoPrcss: Innovation process.

To ensure that the scale has an adequate discriminant validity, cross-loading matrix method, Fornell-Larcker criterion method, and Heterotrait-Monotrait ratio (HTMT) method were employed. First, to guarantee discriminant validity, the outer-loading of each latent variable needs to be higher than the cross-loading with other measurements (Chin, 1988) as shown in table (6). Second, as an indicative of a high discriminant validity, the Fornell-Larcker criterion method (1981) requires a square root of the AVE value for each factor to be greater than the inter-variable correlation coefficient. Table (7) shows that the square roots of the AVEs (bolded diagonal values) are greater than the off-diagonal values in their corresponding rows and columns. Third, HTMT values were lower than the reference value (1.00) stated by Hair et al. (2017).

Table. 6: Loadings (**Bold**) and Cross Loadings

	SMU	Innovation Performance	Innovation Process
SMU-Sup	**0.908**	0.648	0.616
SMU-Cus	**0.900**	0.663	0.691
SMU- Com	**0.774**	0.494	0.492
InvoPrfrm1	0.661	**0.908**	0.670
InvoPrfrm2	0.691	**0.924**	0.700
InvoPrfrm3	0.635	**0.908**	0.649
InvoPrfrm4	0.610	**0.888**	0.680
InvoPrfrm5	0.535	**0.830**	0.595
InvoPrcss1	0.652	0.698	**0.919**
InvoPrcss2	0.675	0.712	**0.955**
InvoPrcss3	0.662	0.696	**0.952**
InvoPrcss4	0.664	0.697	**0.944**
InvoPrcss5	0.659	0.680	**0.938**

SMU: Social media usage; Sup: Supplier; Cus: Customers; Com: Competitors; InvoPrfrm: Innovation performance; InvoPrcss: Innovation process.

Table. 7: Construct Correlation Matrix

	Innovation Performance	Innovation Process	SMU
Innovation Performance	**0.892**		
Innovation Process	0.740	**0.942**	
SMU	0.705	0.703	**0.863**

Table. 8: Heterotrait-Monotrait Ratio (HTMT)

	Innovation Performance	Innovation Process	SMU
Innovation Performance			
Innovation Process	0.776		
SMU	0.791	0.777	

The measurement method used in SEM study can cause a Common-Method Bias (CMB), a phenomenon caused by the method not by the network of causes and effects in the proposed model (Kock, 2015). Different methods can be used to assess CBM. Kock (2015) proposed a method for identifying CMB, in which, CMB can be checked by referring to inner variance inflation factors (VIF) for all latent variables in the model. According to Kock (2015), VIF values greater than 3.3 indicate that the model may be distributed by CMB. Inner VIF values (table 9) of the current study were less than 3.3 which satisfies Kock's proposed criteria and provide support that CMB was not an issue.

Table. 9: Inner VIF Values

	Innovation Performance	Innovation Process	SMU
Innovation Performance			
Innovation Process	1.978		
SMU	1.978	1.000	

The previous results confirm and support the convergent validity, internal consistency, discriminant validity, and absence of the CMB necessary to justify testing the hypotheses.

4.5. Assessment of Hypotheses - The Structural Model

A series of criteria can be employed to assess the structural model in variance-based PLS, including R^2, f^2 effect sizes, Stone–Geisser's Q^2 predictive relevance, and the standardized root mean square (SRMR) values. According to Chin (1998), the value of the determination of coefficients (R^2) should be at least 0.10 to ensure a satisfactory model fit. In this study, 61% of the variance occurred in innovation performance explained by SM usage, and 49% occurred in innovation process explained by SM usage. Hence, both R^2 values exceeded the recommended threshold score indicating that SMEs' innovation process and innovation performance can be significantly enhanced by leveraging their SM usage. Furthermore, f^2 values, which represent the amount of change in R^2 when the independent variable is removed from the model, fall within the suggested range by Cohen (2013) and the guidelines of Bagozzi and Yi (1988), who stated that f^2 values of 0.02, 0.15, and 0.35 represent small, medium, and large effect sizes, respectively. The f^2 value of 0.306 for the innovation process on innovation performance indicates a large effect size. The f^2 value of 0.175 for SM usage on innovation performance indicated medium effect sizes, while the f^2 value of 0.978 for SM usage on the innovation process indicated a large effect size. The observed effect sizes indicate that SM usage has a substantive impact on the innovation process as well as innovation performance providing evidence regarding the important role SM usage plays in fostering innovation within SMEs.

Table (10) summarizes the structural model results. The Stone-Geisser calculations (Henseler et al., 2009) displayed Q^2 values of 0.494 for innovation performance and 0.492 for the innovation process. Both values are greater than zero, indicating that the structural model has a satisfactory predictive power (Falk & Miller, 1992), which affirms the model's capability to reliably predict the outcomes. Finally, The SRMR value in this study was 0.04 (Table 11), indicating a significant model fit for a sample size greater than 100 (Henseler et al., 2016; Cho et al., 2020).

Table. 10: Structural Model Results

Construct	R2	R2 Adj.	Q2	SRMR
Innovation Performance	0.615	0.613	0.494	0.04
Innovation Process	0.494	0.494	0.492	

Table. 11: f^2 values

	Innovation Performance	Innovation Process	SMU
Innovation Performance			
Innovation Process	0.306		
SMU	0.175	0.978	

Bootstrapping using SMART-PLS V.4 was performed to compute t-statistics and obtain the significance levels for direct and mediating relationships (Table 12). The current research paper suggests four hypotheses: PLS-SEM findings show that SM usage positively and significantly affects the innovation process ($\beta = 0.703$, t-value = 26.420, $p < 0.001$), which suggests that as Jordanian SMEs increase their SM platforms utilization, their innovation processes will greatly and markedly be enhanced. Additionally, the findings reveal a significant positive effect of the innovation process on innovation performance ($\beta = 0.483$, t-value = 10.535, $p < 0.001$), this finding implies that improvements in the innovation process would lead to tangible and visible enhancements in SMEs' innovation performance. Moreover, SM usage positively and significantly affected innovation performance ($\beta = 0.365$, t-value = 8.518, $p < 0.001$), which highlights the importance of leveraging SM in fostering positive and favorable innovation outcomes among SMEs' performance. Furthermore, the results show that the indirect effect of the innovation process on the relationship between SM usage and innovation performance is positive and significant ($\beta = 0.340$, t-value = 9.500, $p < 0.001$). In the PLS path model, mediation can be understood as a change in the independent variable that causes a change in the mediator variable, which in turn causes a change in the dependent variable (Hair et al., 2017). Mediation analysis revealed a significant indirect effect of SM usage on innovation performance ($\beta = 0.340$, t-value = 9.500, $p < 0.001$). The total effect of SM usage on innovation performance without the involvement of the innovation process was also significant ($\beta = 0.705$, t-value = 29.577, $p < 0.001$). With the inclusion of the innovation process as a mediator, the effect of SM usage on innovation performance was still significant ($\beta = 0.365$, t-value = 8.518, $p < 0.001$). This indicates that the innovation process partially mediates the relationship between SM usage and innovation performance (Hair et al., 2017). Based on the mediation analysis and t-statistics values, the results of this study emphasize the potential benefits of leveraging social media platforms as part of SMEs' strategic innovation initiatives since it plays a pivotal role in influencing SMEs' innovation process as well as their innovation performance.

Table. 12: Summary of Hypotheses testing outcomes

Study Tested Hypotheses	Beta	t-Value	p-value
SM usage -> Innovation Process	0.703	26.420	0.000
Innovation Process -> Innovation Performance	0.483	10.535	0.000
SM usage -> Innovation Performance	0.365	8.518	0.000
SM usage -> Innovation Process -> Innovation Performance	0.340	9.500	0.000
Mediation Analysis Results			
Total effect SM usage -> Innovation Process	0.705	29.577	0.000
Direct effect SM usage -> Innovation Performance	0.365	8.518	0.000
Indirect effect of SM usage on Innovation Performance	0.340	9.500	0.000

5. Discussion

Traditional business strategies and practices have been transformed and reshaped owing to the evolution and advancements in digitalization, especially in information and communication technologies. Many scholars have stated that the linkage between digitalization and innovation is becoming among the most researched topics (Li et al., 2023; Dahlman et al., 2016). Implementing such technologies has become a priority for firms that strive to enhance their creativity and innovation and gain a competitive

advantage, especially SMEs, as they tend to resist innovation and consider it a risk that requires vast knowledge (Garcia-Morales et al., 2018). Web 2.0: Tools have created a new world of possibilities for improving SMEs' innovation capabilities and encouraging innovation processes. SM can be viewed as a tool that connects diverse stakeholders and promotes more significant interaction among them to enable higher levels of innovation (Bhatti et al., 2021). However, SM usage as a driver of innovation is still in its infancy, focusing more on developed countries (Bhatti et al., 2021). Therefore, examining mediators that transmit the effects of SM usage on firm performance is crucial and scarce simultaneously (Sun & Liu, 2023).

A research model that explores the effect of SM usage on SMEs' innovation performance through the digital innovation process has been developed to fill this gap. The objective of this study was to answer two research questions. The first research question examines the direct impact of the external use of SM on SMEs' innovation performance. The second question examined the indirect impact of the external use of SM on SMEs' innovation performance by utilizing the digital innovation process. Two hypotheses were developed to answer these research questions. Analysis of survey data from 559 Jordanian SMEs found that social media usage has a direct positive impact on innovation performance as well as an indirect effect transmitted through enhanced digital innovation processes. The results empirically demonstrate social media's ability to connect SMEs with external sources to improve idea creation, experimentation, and implementation activities that drive revenues from new products and services. This research addressed a need for quantitatively testing the interlinkages between social media, digital innovation processes, and performance specifically in Jordan as one of the developing economy SMEs. The findings offer valuable practical insights for SME managers aiming to leverage social media engagement with customers, competitors, and suppliers to strengthen business innovation and competitiveness.

5.1. Theoretical Contributions

The common thread among the diverse studies in the literature is that using SM will enhance existing firm capabilities, which, in turn, will enhance business performance. Thus, the findings of this study agree with and confirm the general theme of previous research regarding the positive impact of SM. For instance, Bugshan (2015) confirms that SM is a cost-efficient way for firms to examine external sources of innovation and has both direct and indirect effects on individuals' intention to participate in open innovation. Papa et al. (2018) found that SM positively impacts three knowledge-creation processes (socialization, externalization, and combination) and innovation within firms. Cheng and Krumwiede (2018) support the idea that two types of capabilities (market and technological processing) and SM enhance the effect of supplier involvement on new product development in terms of product innovativeness, market performance, and financial performance. Furthermore, Cheng and Krumwiede (2018) found that SM usage strengthens the positive effect and alleviates the negative effect of supplier involvement in product innovativeness. However, previous research has focused on SM platforms as tools to gather data from customers or suppliers. Regarding the proposed model, SM usage includes a holistic view of gathering data from customers, suppliers, and competitors. Furthermore, innovation performance is not restricted to new product development. In this study, innovation performance was evaluated based on the number of new products, services, managerial practices, financial revenue, and enhanced marketing campaigns.

This study answers calls for exploring mediating effects in the SM usage-innovation performance linkage (Sun & Liu, 2023). It builds on the work of Papa et al. (2018) by connecting the two different literatures–SM/ICT and innovation–to contribute to the existing literature. In the proposed model, we examine the indirect effect of the external usage of SM on SMEs' innovation performance through the utilization of the digital innovation process to broaden the understanding of the role ICT capabilities play in enhancing firms' innovation performance. These results are consistent with those of Garrido-Moreno et al. (2020), who indicate that social customer relationship management and customer engagement capabilities mediate the relationship between SM usage and organizational performance.

De Zubielqui and Jones (2020) found that the relationship between SM and innovation is mediated by managerial learning. They also find that market and technological dynamism moderate the effect of SM on innovation. De Oliveira et al. (2020) found that the positive relationship between SM and innovation (radical and incremental) is mediated by several digital channels and moderated by digital capabilities. Zhang et al. (2020) found that SM-based structural, cognitive, and relational linkages can improve innovation performance, while knowledge transfer effectiveness and absorptive capacity can mediate it. Additionally, the level of customer involvement in SM and top management support for SM usage significantly impact open innovation adoption (Bhatti et al., 2021). Bhatti et al. (2021) found that knowledge management capabilities mediate the relationship between top management's support for SM usage and open innovation. Sun and Liu (2023) found that business analytics, social legitimacy, and entrepreneurial proclivity mediated the effect of SM usage on new product development. Similarly, our empirical results show that digital innovation partially mediates the relationship between SM usage and SMEs' innovation performance. Furthermore, many scholars have stated that the linkage between digitalization and innovation is increasingly among the most researched topics (Li et al., 2023; Dahlman et al., 2016).

5.2. Managerial Implications

Our findings have the following implications for SME managers and owners. *First*, SM platforms are valuable sources of explicit data that drive innovation among SMEs in Jordan as one of the developing economies. In addition, SM can provide SMEs with access to diverse knowledge. Hence, managers should be aware of the benefits of investing in SM and employ such platforms to exploit the external environment to gather information that stimulates innovation performance. *Second*, regarding the external environment, SME managers should consider all users, such as customers, suppliers, and competitors, as potential sources of good ideas that can be translated into new innovative products, services, and processes. *Third*, the indirect effect of SM on innovation performance should be considered. Managers often emphasize the direct outcomes of SM platforms. However, the costs and risks are high when it comes to innovation. Thus, the indirect impact of SM platforms usage on innovation performance through the digital innovation process could lessen drawbacks/risks and better stimulate SMEs' innovation performance. Our results suggest that SM can be considered a base for idea generation, screening, testing, marketing, and implementation, which would enhance SMEs' innovation performance.

6. Limitations and Directions for Future Research

This study has the following limitations. The *first* relates to the usage of SM, which was measured as a general usage rather than a specific usage. External usage of SM was measured by combining the usage of customers, suppliers, and competitors as a single measure or variable, which makes it unclear which SM platform users have the most decisive impact on firms' innovation performance. Therefore, future research should consider this matter by focusing on the detailed usage of SM and examining their impact independently. *Second*, the current study's sample was drawn only from SMEs operating in Jordan, which limits the generalizability of the results and provokes a question about large firms where various constraints, resources, and competencies in entirely different contexts might lead to different results and may open avenues for future research. In addition, the current study has a cross-sectional design, which might produce various results at several points in time due to changes in the psychology and perspective of respondents over time. Thus, to overcome this limitation, a longitudinal study should be conducted to eliminate causality problems and provide a better explanation and deeper understanding of the relationships between the variables of the research model. *Additionally*, the results of this study, it is worth noting that further research is needed to explore the impact of SM on the digital innovation process as a dependent variable and

examine the relationship by considering other moderating variables that might enhance the impact of SM on the digital innovation process. *Finally*, regardless of the acknowledged limitations, this study provides a novel understanding of the impact of SM usage on digital innovation processes and innovation performance in the context of SMEs. This finding provides empirical evidence of the significant role of SM usage in innovation and directions for future research.

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