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Article

Toward Digital Transformation and Business Model Innovation: The Nexus between Leadership, Organizational Agility, and Knowledge Transfer

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Abstract: The post-pandemic age has heightened the importance of digitalizing organizational practices and fostering innovation for SMEs to ensure resilient business operations in a volatile work environment. This research paper examines the impact of digital transformation leadership on the digitalization of business practices and the development of innovative business models while considering the roles of organizational agility and knowledge transfer. A survey of 270 employees from SMEs in Lebanon was conducted using the convenience sampling technique. Data analysis was performed quantitatively through Partial Least Squares—Structural Equation Modeling (PLS-SEM). The results reveal that adopting digital transformation leadership fosters organizational agility, enabling effective digital transformation and business model innovation with a robust knowledge transfer system. This study contributes to the fields of digital transformation and innovation, and offers practical insights for SME managers navigating uncertainties and market volatility in the post-pandemic period.

Keywords: digital transformation; leadership; business model innovation; organizational agility; knowledge transfer; post-pandemic



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1. Introduction

Peter Drucker once said: “A time of turbulence is a dangerous time, but its greatest danger is a temptation to deny reality” (Drucker 1993). Due to the emergence of contemporary digital technologies, organizational environment and business processes are hastily changing as a result of the advances in the internet, artificial intelligence, big data, and other technology-mediated tools and techniques, along with the rapid changes in customer preferences and exceptional disruptions generated by the COVID-19 pandemic (Bag et al. 2023). Hence, firms are expected to realize this reality, explore the prospects evolving from digital technologies, and promote agility in order to be able to swiftly cope with the dynamic environment and meet the considerable changes in the market. In this sense, SMEs in Lebanon are required to pursue digitalization practices despite the challenges related to data shortage, lack of technological capabilities, and brain drain (Skafi et al. 2020), because the Lebanese economy is greatly dependent on SMEs (Nasrallah and El Khoury 2022). This issue has become more critical in the post-pandemic age; SMEs are supposed to learn from the unprecedented pandemic experience, which caused operational disruptions and alerted SMEs to the need to become more agile and highly proactive (Zakhem et al. 2022). In spite of these hitches, applying digitalization in the workplace, especially at the level of SMEs,

encompasses several benefits, including transparency, higher customer satisfaction, greater ability to compete in the market, better access to data, improved facilities and services, support for eco-friendliness, and efficient supply chain processes (AlNuaimi et al. 2021; Vrechopoulos et al. 2022; Valdez-Juárez et al. 2023). According to McGrath and McManus (2020), managers sometimes decide to extensively capitalize on digitalization on a wide scale, then unfortunately face disappointments and remain within the preliminary stage without any progress. This usually happens due to a gap between strategy formulation and strategy implementation (Li 2020). In other words, the major pitfall here is the absence of organizational leaders who have a digital transformation leadership vision, especially at the level of SMEs, where capabilities and skill sets are usually limited (Dethine et al. 2020).

Within the Industry 4.0 paradigm, organizations have abundant tools and techniques to digitalize their practices and achieve innovation-driven business models (Grandinetti et al. 2022; Kohnová and Salajová 2023). However, this does not mean that firms can easily transform their processes and develop sustainable business models in a straightforward manner, because successful digitalization requires firms to address the challenges that generally arise due to the accelerated technological change, level of dedication among employees, skill sets of keen technological players, as well as other environmental factors that shape the digital transformation planning and implementation phases (Scuotto et al. 2022). Nonetheless, when firms run technological changes and build innovative business models while disregarding the importance of building all-inclusive plans and strategies, failure becomes certain (Bresciani et al. 2021a; Andersen et al. 2022). Consequently, organizational leaders are supposed to concoct an agile organization that fosters digital mindsets and quickly responds to the dynamic digital environment by developing innovative business models that create value and help the firm meet the rapid changes taking place in the marketplace (Vial 2019; Ammirato et al. 2022).

In today's rapidly evolving business environment, digital transformation has become a critical driver of success and survival for organizations worldwide (Moghrabi et al. 2023). As companies embark on their digital transformation journey and business model innovation, the role of leadership in guiding and orchestrating this change has gained considerable importance (Sainger 2018). SMEs in Lebanon, as in many other unstable economies, face unique challenges in adopting digital technologies and adapting their business models to stay competitive in an increasingly globalized and digital marketplace. Investigating the nexus between digital transformation leadership and organizational agility is particularly relevant in this context, as it can provide insights into how SMEs can effectively navigate the complexities of digital disruption.

By examining the extent to which effective digital transformation leadership influences organizational agility, this study seeks to uncover practical strategies and practices that can empower SMEs in Lebanon to embrace digital transformation more effectively. Moreover, understanding how enhanced organizational agility drives further digital transformation and business model innovation can help SMEs to craft effective strategies that ensure sustainable growth and success in the long term.

The findings of this study carry useful implications for policymakers, business leaders, and stakeholders in Lebanon's SME sector, offering guidance on fostering a culture of digital innovation and agility. As the business environment continues to be reshaped by technological advancements and market uncertainties, a deeper understanding of the nexus between digital transformation leadership, organizational agility, digital transformation, and business model innovation is vital for SMEs to thrive and remain competitive in the digital age.

Accordingly, this research aims to contribute to the extant understanding of the practices that expedite and smoothen the digitalization process and innovation in SMEs by analyzing the nexus between leadership, organizational agility, and knowledge transfer. Moreover, by providing empirical data from Lebanon which is less examined by scholars, this study expands the geographic scope of the literature. In this sense, this paper seeks to answer the following questions: "To what extent does digital transformation

leadership influence organizational agility?” and “How does this influence impact the successful adoption of digital practices and the development of innovative business models within Lebanese SMEs?” In order to answer these questions, several sub-questions arise. To what degree does the leadership style affect organizational agility? What is the impact of organizational agility on digital transformation and the development of innovative business models? And how does knowledge transfer enhance the value creation of innovative models?

The purpose of this research is to understand the factors that shape the success of digital transformation and the development of innovative business models in SMEs within the Lebanese context following the major obstacles and the unconventional digital experience encountered during the COVID-19 pandemic (Zakhem et al. 2022; Gyurák Babel'ová et al. 2022), especially the high contribution of SMEs to the recovery process and economic growth in Lebanon (Bakhouché 2022). The novelty of this research paper lies in its exploration of the nexus between digital transformation leadership, organizational agility, and knowledge transfer in the context of Lebanese SMEs. While previous research has investigated the impact of digital transformation leadership on digital transformation (AlNuaimi et al. 2022), this study takes a pioneering approach by delving into the relatively unexplored area of business model innovation. It seeks to uncover how effective leadership in digital transformation can drive innovative changes in business models within the challenging environment of Lebanese SMEs, characterized as it is by economic constraints and limited technological capabilities. The study further aims to address prominent gaps in the literature related to the roles of digital transformation leadership vision, organizational agility, and knowledge transfer in fostering value proposition and business model innovation.

To address the aforementioned research questions, this paper focuses on the consonance among different elements which have not been addressed before, particularly within the Lebanese context. Examining the impact of critical events such as the digital transformation and the creation of innovative business models in the post-pandemic age entails extensive and comprehensive examination which can serve as a guideline for a long period of time.

In view of this, the present research tackles several eminent gaps in the literature which have been highlighted by previous scholars: (1) the role of digital transformation leadership vision in fostering a sense of agility (AlNuaimi et al. 2022; Giacosa et al. 2022); (2) the role of organizational agility in responding to digitalization needs (AlNuaimi et al. 2022; Mangalaraj et al. 2023); (3) the role of organizational agility in the development of innovative business models (Colovic 2022; Scuotto et al. 2021); and the presence and shielding role of knowledge transfer (Tajpour et al. 2022; Arsawan et al. 2022).

Hence, this study aims to fill these literature gaps and in the process to develop a framework for academics who are interested in expanding their horizons in areas related to value proposition and digital transformation. Similarly, the resulting findings can be used by practitioners (mainly SME managers) to advance their understanding of this topic and enhance their digitalization and business model practices in order to quickly adapt to the environmental changes in the post-pandemic period. This research paper encompasses six additional sections: a literature review, methodology, results, discussion, conclusions and implications, and finally limitations/recommendations for future analyses.

2. Theoretical Framework and Hypotheses Development

2.1. Digital Transformation Leadership (DTL) and Digital Transformation (DTR)

Digital transformation refers to the deliberate alterations which take place as a result of the advances emerging in computer-related technologies (Bresciani et al. 2021b). At the firm level, digital transformation is defined as the tendency of firms to move toward the adoption and utilization of data analytics, mobile-mediated technologies, cloud computing, social media, and artificial intelligence while conducting business processes and serving customers (Tabrizi et al. 2019; Brock and Von Wangenheim 2019; Jedynak et al. 2021). In this sense, Nasiri et al. (2020) viewed digital transformation as an approach through which

organizations undertake makeovers to their culture, operations, and procedures to fulfill the requirements brought about by dynamic market changes through the incorporation of digital tools and technologies. Other common definitions of digital transformation include the espousal of various technologies and innovations resulting in the production of unusual structures, activities, and arrangements that partially or totally replace traditional rules (Mangematin et al. 2014; Scuotto et al. 2020; Vaska et al. 2021).

According to Frankwick et al. (1994), management is the main source of defining and shaping an organization's belief system; thus, when organizations are expected to change, leaders are supposed to take the initiative and respond. Because digital transformation entails substantial changes in organizational arrangements, it needs to gain legality and the acceptance of the firm's overall belief system in order to be successful (Hinings et al. 2018; Zhou and Li 2010). This is to say that when firms uphold a digital culture and digitalize their supply chain processes, it requires the approval and gratification of the leaders who finance, promote, and drive various stakeholders to take action toward making the new technology-driven business processes more useful and applicable (Chierici et al. 2020; Nadkarni and Prügl 2021).

Scholars have highlighted the role of leadership in enhancing Industry 4.0 and the digital age. For instance, Priyono et al. (2020) state that leaders' role in helping digitalization to succeed encompasses pursuing technological trends, formulating strategies, and leading the organization towards the proper implementation of new technologies. In addition, Bresciani et al. (2021b) emphasize that "digital leaders" are those who have a technology-oriented mindset and create cooperative networks for finding and applying digital competencies. Transformational leaders are those who seek to build up others, promote trust, and assume the role of moral agents to serve the needs of the workgroup (Bass and Avolio 1990; Krishnan 2001). Thus, digital leadership is the output of a successful combination of the transformational leadership approach and the digital mindset (Mihardjo et al. 2019).

New Institutionalism Theory provides a framework for understanding how leadership affects digital transformation. This theory helps to understand organizational behavior by concentrating on the compelling and enabling influences of formal and informal regulations on individual and group behavior (March and Olsen 1983). This theory clarifies how organizations deal with their environment in order to survive and flourish amidst fierce competition (Suchman and Edelman 1996; Martínez-Ferrero and García-Sánchez 2017). According to this theory, three pillars shape organizations and their collective practices in response to environmental changes. The first is the coercive pillar, which primarily originates from the government and the rules of law. The second is the cognitive or imitative pillar, which predominantly stems from the decision-maker's reliance on other firms' behavior. The third is the normative pillar, which depends on the social expectations generated by professionals and other actors. These pillars can be used to understand the role of leadership in fostering and implementing digital technologies in the workplace. Leaders may respond to change by adopting digitalization as a response to governmental rules, such as during the COVID-19 pandemic when social distancing was a legal requirement (coercive), as an imitation of other competing firms who have proven to be successful in implementing technologies and gaining a competitive edge in the market (mimetic), or in fulfilment of the needs and preferences of customers, employees, suppliers, consultants, and other stakeholders (normative). Based on the above, the extant literature pinpoints the positive relationship between transformational leadership and a firm's innovative and technological capabilities.

2.2. Digital Transformation Leadership (DTL) and Business Model Innovation (BMI)

A business model refers to the fashion through which a firm develops, acquires, and delivers value (Zott et al. 2011). It essentially demonstrates the organizational strategic direction (Casadesus-Masanell and Ricart 2010), portraying the rationality behind the existence of the business and the approach through which the business operates and delivers value to its various stakeholders (Battistella et al. 2017). From a configurational

perspective, the business model is a set of components including a value proposition, key activities, customer segments, revenue streams, key resources, and the amalgamation among them (Foss and Saebi 2017). Business model innovation encompasses the process of synthesizing a novel value system or undertaking changes to the organization's current system (Zott and Amit 2010). Business model innovation is different from process or product innovation in that the former involves undertaking changes to the firm's supply chain activities and operational processes, rather than merely to the product and its features (Visnjic et al. 2016). This definition complies with Casadesus-Masanell and Zhu (2013), who proclaim that business model innovation entails the search for new ways that capacitate the firm to create greater value by discovering unconventional ways to generate revenue and create a unique value proposition for its various stakeholders. The drivers of business model innovation are numerous. For instance, an organization may pursue business model innovation in response to the pressure exerted by the firm's environment, moves taken by the rivals, or a change in customers' tastes, preferences, and expectations (Schneider and Spieth 2013; Teece 2018). Moreover, internal influences play a role in prompting business model innovation. These factors include technological upgrades adopted by the firm (Calia et al. 2007), organizational agility (Doz and Kosonen 2010), and the firm's improvement of its competences (Seelos and Mair 2007). According to Battistella et al. (2017), business model innovation emerges as a tactic to overcome challenges in the firm's processes and routines, and necessitates substantial modification in the management and standard operational procedures.

Research has focused on the important function of leaders in developing and enhancing business model innovation (Chesbrough 2007; Snihur and Zott 2020). More specifically, leaders are the major players in sharing an innovative vision with their subordinates, leading the strategic change process in a non-stop manner, and putting business model innovation into action (Chesbrough 2010; Galanti et al. 2023). In parallel, the major impediment for businesses to innovate their practices is the lack of leadership innovation (Chesbrough 2007). In compliance with the aforementioned, DiBella et al. (2023) state that a firm builds value when its leaders are innovative and oriented toward sustainability, especially at the level of SMEs, where the owner is the main decision-maker.

The relationship between digital transformation leadership and business model innovation can be defended by the Path–Goal theory. According to the Path–Goal theory, the behavior of leaders is deemed an essential source of influence, change, inspiration, and motivation for subordinates (House and Mitchell 1975; Schriesheim and Glinow 1977). This theory necessitates the presence of learning leaders in the firm who are always eager to spread a culture that appreciates learning and pursues supportive and achievement-directed behavior (Silverthorne 2001). In addition, a major focus of the path–goal theory is on the responsibility of leaders to help subordinates eliminate barriers and improve their confidence (Dare and Saleem 2022). By projecting this theory on the aforementioned relationship, we assume that digital transformation leaders are those who act for the sake of promoting digitalization, fostering an innovative and technology-driven culture, motivating employees to be innovative in discovering and implementing technological change, and helping subordinates to remove sources of fear and barriers to change. In this sense, employees will be more confident in their capabilities and motivated toward generating unusual ideas, which can serve as a foundation for novel business models.

2.3. Digital Transformation Leadership (DTL) and Organizational Agility (OAG)

In today's digital economy, the only competitive advantage is an organization's potential to quickly cope with change (Ireland and Webb 2007; Hidayat et al. 2022). Organizational agility refers to a firm's ability to responsively adapt and effectively adjust its strategies to react to shifts in markets, technological advancements, trends, and rivalries (Harraf et al. 2015; Felipe et al. 2017).

In order for an organization to embrace original and institutional change, a high level of organizational commitment is required, including resources, skills, and competencies

that leverage the firm towards mobilization (Hannan and Freeman 1984), which is a typical leadership act (Greenwood and Hinings 1996). Organizations are supposed to enhance and shield their legitimacy when suggesting change by pursuing practices and developing leaders with the desire and the necessary qualities or attributes (Weritz 2022; Tina Dacin et al. 2002). Leadership is essential for fostering organizational agility. More specifically, agility is successfully accomplished when leaders have the skill of converting their organization's unfavorable situations and unsuccessful strategic decisions into more pragmatic, efficient, and responsive ones (Ahammad et al. 2020). Organizational agility is an illustration of proper communication, non-stop improvement, flexibility, and the existence of organizational teams characterized by self-awareness, maturity, enthusiasm, self-discipline, and improvisation (Stettina and Heijstek 2011). These attributes necessitate the presence of leaders who share power, responsibilities, and decision-making among their subordinates in order to ensure that team trust and motivation are in place (Klein et al. 2006). This becomes highly critical during challenging times, such as the COVID-19 pandemic and post-pandemic, where team trust and motivation are essential for business continuity (Babapour Chafi et al. 2022; Onesti 2023). Thus, the leadership style within an organization plays an important role in developing and enhancing organizational agility.

This relationship can be reinforced by New Institutionalism Theory, in which the skills of leaders are assumed to be the basis for elevating change at the institutional level. According to Nadler and Tushman (1990), these leadership skills comprise being charismatic (i.e., developing a vision and enabling subordinates), instrumental (i.e., organizing, overseeing, and rewarding), and institutional (i.e., making sure that changes are successfully put in place). Based on this, it can be seen that these attributes are strongly related to the characteristics of transformational leaders who exhibit a high level of drive towards enhancing their followers' values, emotions, and behaviors (Bass and Avolio 1993). Thus, transformational leaders augment organizational agility by creating successful relationships with subordinates and triggering them to put their organizational interests over their personal interests to ensure that operations become more effective in a dynamic, changing, and uncertain environment. This reconciles with the idea of Veisheh and Eghbali (2014), who state that transformational leaders are those who always make sure that their subordinates are well prepared to take necessary actions in response to the challenges of a fragile work setting. In other words, organizations which enjoy a high level of agility are assumed to have transformational leaders who regularly follow trajectories directed towards accepting change and improvement. Based on the above, the following hypotheses are derived.

Hypothesis 1. *Digital transformational leadership positively affects a firm's agility.*

2.4. Organizational Agility (OAG) and Digital Transformation (DTR)

As previously mentioned, organizational agility is defined as an organization's capacity to quickly adapt and purposively bend its strategic direction to react to changes in technology, market trends, and competition (Harraf et al. 2015; Felipe et al. 2017). Such organizational reactions come as a response to environmental changes and are deemed vigorous in reorganizing and/or restructuring organizational hierarchies and business operations (Mugenyi et al. 2022). This means that change decisions are not merely based on internal efficiency-driven goals, but by environmental factors to which a firm responds in order to maintain legitimacy (Stone and Brush 1996). According to Liu et al. (2011) and Gupta et al. (2020), digital transformation is the fruit of institutional constraints. This reconciles with Bresciani et al. (2021b) who state that the choice of digitalizing organizational practices is most likely to be triggered by isomorphic factors including government, competitors, and customers. Organizational agility is highly critical in SMEs (Chan et al. 2019), especially in the post-pandemic age where digital transformation is crucial for business continuity (Ahmed et al. 2022). Thus, organizational change is a fundamental factor for digital transformation and can be an impediment for digitalization if not tackled correctly (Hanelt et al. 2021). For this reason, organizations are required to upgrade their structure,

customary methods, and strategic tactics to become more agile and responsive (Faro et al. 2022). Agility entails elevating current processes by instigating new practices and inputs along with instrumentally reshaping the organizational structure and operational standards (Troise et al. 2022). This means that an agile organization approaches digital transformation more easily by enabling change functions across the entire organization to pursue the optimal combination of technology concepts.

The agility–digitalization relationship can be fortified by New Institutionalism Theory. As previously stated, this theory encompasses three pillars that shape organizations and their collective practices in response to environmental changes: coercive, imitative, and normative (March and Olsen 1983). As per Bresciani et al. (2021b), the decision to digitalize is most likely to be triggered by isomorphic factors including government, rivals, and customers. Moreover, from the new institutionalism perspective, Greenwood and Hinings (1996) state that agile firms emphasize the utilization and progress of knowledge structures in order to be able to deliver value (normative) and to smooth the capacity of taking prompt response toward competitors in a dynamic environment (imitative). In addition, Ghasemaghahi et al. (2017) proclaim that the application of data analytics augments agility, which in turn helps the firm attain higher levels of aptness between data, staff member utilization, firm operations, and customer needs. Based on the above, we assume that organizational agility is the prerequisite for the proper implementation of digital transformation.

Hypothesis 2. *Organizational agility positively affects digital transformation.*

2.5. Organizational Agility (OAG) and Business Model Innovation (BMI)

When a firm observes an opportunity or a threat, it is required to improve its ability and modify its business model in an adequate and well-timed manner in order to be able to sustain its presence in the marketplace (Teece and Linden 2017). As previously stated, organizational agility incorporates the capacity of a firm to simplify the exploration and utilization of pertinent knowledge needed to develop new products/services or to respond to competitors' actions (Cegarra-Navarro et al. 2016; Darvishmotevali et al. 2020). The notion of organizational agility and its impact on the overall effectiveness of a firm are not new within the realm of strategic management (Mikalef and Pateli 2017). For example, Chakravarty et al. (2013) assert that agility is strongly fashioned by a firm's technological competencies and is deemed a fundamental driver for organizational performance. In addition, Lu and Ramamurthy (2011) state that agility involves two main dimensions which are highly symbiotic: market capitalizing agility and operational adjustment agility. The first dimension entails a firm's capability to take action toward the opportunities that arise in the external environment by constantly observing and quickly augmenting its products or services to meet changing customer needs, wants, and preferences (Lu and Ramamurthy 2011). According to Mikalef and Pateli (2017), this form of agility is derived by context-driven decisions and a growth-directed spirit to meet the rapid changes in the organizational environment. This complies with Chakravarty et al. (2013), who stress the importance of this form of agility in increasing the firm's level of opportunity recognition. The second dimension comprises the firm's internal ability to reformulate its processes to promptly address and react to market changes, thereby fostering a culture that supports change, encouraging trial-and-error approaches, and provisioning improvisation for the sake of achieving a unique/innovative value proposition (Sambamurthy et al. 2003). Likewise, Idrees et al. (2022) proclaim that organizational agility serves as an ultimate organizational element in helping firms to develop innovative products, services, and business processes. In addition, agility is viewed as the foundation for creating sustainable and innovative business models which serve as a recovery key for SMEs in the post-pandemic period (Priyono et al. 2020).

New Institutionalism Theory supports the theoretical underpinning for the organizational agility–business model innovation relationship. For instance, Liao et al. (2019)

assert that business model innovation is the product of change signs derived from the environment. Similarly, [Schneider and Spieth \(2013\)](#) affirm that the origination of innovative business models comes as a following move to competitors' successful actions or changing customer inclinations. By projecting the above to the three dimensions of New Institutionalism Theory mentioned before, we uphold the notion that business model innovation is the fruit of imitating prosperous competitors (i.e., imitative dimension) or believing in the importance of satisfying customers' changing needs and wants (i.e., normative dimension). Moreover, [Seelos and Mair \(2007\)](#) view the firm's technologies and flexible internal developmental capabilities as the basis for shaping innovative business models. This enhances the idea that the normative dimension of New Institutionalism Theory is one of the key foundations for understanding the agility–business model innovation relationship.

Hypothesis 3. *Organizational agility positively affects business model innovation.*

2.6. The Moderating Role of Knowledge Transfer (KTR)

Knowledge transfer is a vital factor for firms to survive ([Argote et al. 2000](#)). It is defined as the process of disseminating useful content and/or knowledge to others and delivering inputs that essentially aid in the problem-solving practice ([Ringberg and Reihlen 2008](#)). From a technology-driven perspective, [Garavelli et al. \(2002\)](#) viewed knowledge transfer as the interactive process between cognitive systems which encompasses the codification and analysis of the subjects being involved in the sharing process. Knowledge transfer assumes a critical function in sustaining the operations of technology-directed companies and helping them attain a competitive edge in the market ([Donnelly 2019](#)). Moreover, in order to meet the environmental challenges, organizations are expected to strengthen their body of knowledge and pool of knowledge resources ([Sánchez Ramírez et al. 2022](#)). In this context, knowledge transfer is deemed to be the foundation for producing sustainable deliverables ([Santos-Vijande et al. 2012](#)). This is affirmed by [Johnson \(2017\)](#), who asserts that knowledge is the bedrock for securing and preserving a unique value proposition in the market. In addition, the amalgamation of knowledge into a firm's current business model allows the firm to develop unique processes that can be a fundamental source of innovation and sustainability ([García-Piqueres et al. 2019](#); [Ul-Durar et al. 2023](#); [Nosratabadi et al. 2023](#)).

Although the subject of knowledge transfer and its impact on innovation is highly important, few research studies have tackled the contributions of knowledge transfer in crafting innovative business models ([Ammirato et al. 2022](#)). Social media has become a source of knowledge transfer that helps firms to gain insights into consumers' unique preferences, tastes, and expectations in order to create a unique value proposition ([Azeem et al. 2021](#)). This is because organizations' agility in acquiring and disseminating knowledge is the fruitful output of knowledge sharing and integration among individuals, which can be strongly facilitated by social media tools ([Nisar et al. 2019](#)). In this regard, [Nonaka et al. \(2000\)](#) contend that the vital element underlying knowledge innovation is the act through which organizational members externalize tacit knowledge gained from living experience and disseminate it to other organizational members to make use of. Thus, knowledge innovation is the essence of all innovative undertakings, including business model innovation ([Li et al. 2022](#)). This aligns with the study of [Bashir and Farooq \(2019\)](#), who assert that knowledge sharing has a considerable impact on a firm's capacity to formulate, enhance, implement, reshape, and innovate its business model in a dynamic and sustainable manner. Based on the literature, we suggest that the readiness of knowledge transfer buffers a firm's ability to develop and enhance an innovative business model.

Hypothesis 4. *Knowledge transfer moderates the relationship between organizational agility and business model innovation.*

3. Methodology

3.1. Sampling and Data Collection

This research work deploys the convenience sampling method and follows a quantitative approach for data collection and analysis. With regard to the sample size, G*power software (3.1.9.7) was used in this study, adopting a statistical power of 80% and effect size of 0.01 based on the recommendations of [Faul et al. \(2007\)](#) and [Hair et al. \(2017\)](#), along with a $\text{Min } R^2 = 0.10$ and $\alpha = 0.01$ considered substantial. The resulting calculated range was between 131 and 180, meaning that any sample size that exceeds 180 participants is considered to be acceptable for analyzing the results and reaching generalizable conclusions.

A questionnaire was administered online and data were collected based on a cross-sectional time horizon from employees of Small to Medium Enterprises (SMEs) in Lebanon. The purpose behind addressing employees working for SMEs is that these firms account for an important part of the Lebanese economy and faced extreme difficulties meeting the technology-related challenges resulting from the COVID-19 pandemic. The employees were employed in various sectors, including manufacturing, financial/insurance, pharmaceutical, information technology, food and beverage, and education. The consent of the owners/managers of the participating SMEs was obtained in advance based on a clear explanation of the purpose/objective of the study and the credentials of the researchers. Moreover, in order to ensure the adequacy, validity, and reliability of the research instrument and its respective items, a pilot test was administered on a 30-employee scale and the necessary amendments were taken into account prior to running the actual data collection process.

SMEs constitute 90% of the business sector and secure almost 50% of the job opportunities in Lebanon; moreover, the largest proportion of SMEs pertains to microenterprises (73%) which employ less than ten full-time equivalent employees ([Nasrallah and El Khoury 2022](#)). Despite SMEs being essential to the Lebanese business sector, studying the SME market faces hurdles related to the limited availability of both financial and non-financial data ([Matta 2018](#)). For this reason, data were collected from 31 SMEs operating in Lebanon following a convenience sampling technique. A total of 270 questionnaires were successfully disseminated in February 2023 across SMEs located in the nine different governorates in Lebanon, and data were collected over a period of 24 days. The decision to distribute 270 questionnaires was based on careful consideration of the research objectives, the target population, the usual response rates received in previous studies targeting SME employees (e.g., [Lythreatis et al. 2019](#); [Bouzakhem et al. 2023](#)), and the desired level of statistical power. To justify this sample size, the principles of statistical significance and representativeness were taken into account. The overall response rate was 77.4% (i.e., the number of returned questionnaires was 209); out of these 209 questionnaires, seven responses were removed for the purpose of avoiding bias and research error (e.g., due to ineligible participants or incomplete records). Anonymity and confidentiality were assured to all participants to ensure that truthful information was collected. For the sake of ensuring the accuracy of the model, collinearity was confirmed with $\text{VIF} < 3.3$, thereby eliminating concerns related to method bias ([Kock 2015](#); [Podsakoff et al. 2003](#)). In addition, classification data such as age and sex were deemed as exogenous factors. Moreover, participants were informed of the purpose of the study and of their right to withdraw at any time, making their participation totally voluntary.

3.2. Measurements

The items of the questionnaire were measured using a Likert five-point scale ranging from 1 = Strongly Disagree to 5 = Strongly Agree. The basis for the questionnaire items adopted in this study was derived from established research and validated scales which are widely used in the fields of digital transformation, leadership, organizational agility, innovation, and knowledge transfer. Digital transformation leadership was measured based on six items adapted from [Chen and Chang \(2013\)](#). For organizational agility, six items were selected from the study conducted by [Cegarra-Navarro et al. \(2016\)](#). Digital

transformation and business model innovation were measured with reference to the five-item and seven-item scales developed by [Nasiri et al. \(2020\)](#) and [Bouwman et al. \(2019\)](#), respectively. Finally, knowledge transfer was adopted from the three-item scale of [Li et al. \(2022\)](#). The items on the questionnaire are presented in the Appendix A. Moreover, the validity and reliability of the measures were tested and are reported below.

3.3. Analysis

In order to test and analyze the research model of the study (Figure 1), PLS-SEM was used due to the presence of latent variables in the aforementioned model. Moreover, normal distribution was not a concern, and statistical significance could be attained with a smaller sample ([Hair et al. 2017](#)).

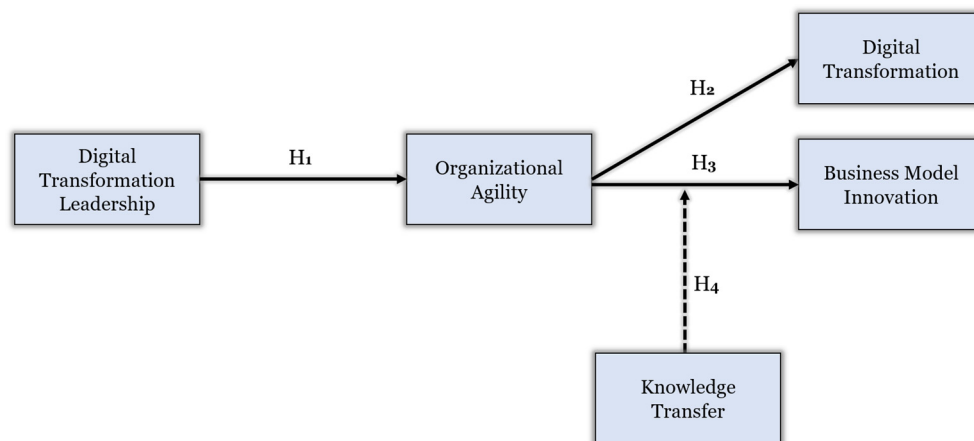


Figure 1. Theoretical model.

The evaluation of the proposed theoretical model employed the PLS-SEM technique, which is widely used in social sciences, information systems, and business research ([Hair et al. 2017](#)). PLS-SEM accommodates reflective, formative, and composite models ([Dijkstra and Henseler 2015](#)), making it applicable in various research settings (descriptive, exploratory, confirmatory, explanatory, and predictive), as noted by [Henseler \(2018\)](#). This software was utilized as it is known for handling models efficiently, including constructs, indicators, and their relationships ([Bari et al. 2023](#); [Li et al. 2023](#); [García-Machado et al. 2023](#)). It allows for evaluating both measurement models (relationships between indicators and constructs) and structural models (relationships between constructs).

4. Results

A description of the respondents' information is provided in Table 1. Moreover, Table 2 reflects the outer loadings used to measure the strength of the relationship between the observed variables and the latent factors. In order to proceed with further analysis, reliability and validity tests were used to assess the quality of the measurement model. In this regard, Table 2 indicates the Cronbach's Alpha, Rho Average, and Composite Reliability (CR) values used as measures of internal consistency, in addition to the Average Variance Extracted (AVE) used to assess convergent validity. Furthermore, Table 3 reflects the Heterotrait–Monotrait ratios (HTMT), which are used to evaluate discriminant validity among measures by estimating the correlation among the constructs. As shown in Table 2, the outer loadings of all constructs incorporated in the research model are found above 0.7. Moreover, the Alpha, Rho A, and Composite Reliability all came across the threshold above 0.7 and below 0.9 ([Jöreskog 1971](#); [Diamantopoulos et al. 2012](#); [Hair et al. 2019](#); [Dijkstra and Henseler 2015](#)). In addition, the AVE is above 0.5, demonstrating satisfactory convergent validity in conjunction with the HTMT levels in Table 3, which are all below 0.85 ([Henseler et al. 2015](#); [Hair et al. 2017](#)). These results indicate that the model is qualified enough to proceed with further data analysis.

Table 1. Respondents' information.

Variable		Frequency	Percentage
Gender	Male	108	53.5%
	Female	94	46.5%
Age	18–25	41	20.3%
	26–35	75	37.1%
	36–45	64	31.7%
	46 and above	22	10.9%
Educational Level	High school	8	4%
	Bachelor	105	52%
	Master	52	25.7%
	PhD	33	16.3%
	Other	4	2%

Table 2. Measurement model.

Constructs	Indicators	Outer Loadings	Alpha	Rho A	CR	AVE
Digital Transformation Leadership	DTL1	0.816	0.752	0.831	0.758	0.729
	DTL2	0.841				
	DTL3	0.845				
	DTL4	0.956				
	DTL5	0.711				
	DTL6	0.824				
Organizational Agility	OAG1	0.851	0.863	0.851	0.854	0.722
	OAG2	0.813				
	OAG3	0.872				
	OAG4	0.745				
	OAG5	0.799				
	OAG6	0.701				
Digital Transformation	DTR1	0.863	0.880	0.895	0.847	0.581
	DTR2	0.823				
	DTR3	0.815				
	DTR4	0.708				
	DTR5	0.877				
Business Model Innovation	BMI1	0.750	0.812	0.882	0.851	0.573
	BMI2	0.809				
	BMI3	0.832				
	BMI4	0.848				
	BMI5	0.755				
	BMI6	0.717				
	BMI7	0.862				
Knowledge Transfer	KTR1	0.891	0.781	0.769	0.710	0.645
	KTR2	0.886				
	KTR3	0.705				

Table 3. Heterotrait–monotrait (HTMT) ratio.

	DTL	OAG	DTR	BMI
DTL				
OAG	0.723			
DTR	0.611	0.625		
BMI	0.703	0.619	0.732	
KTR	0.675	0.730	0.571	0.721

The structural model of the study was analyzed and the results were confirmed, as indicated in Table 4 and Figure 2. In this regard, indices such as the normal fit (NFI = 0.917), the standardized root mean square residual (SRMR = 0.025), and VIF values are all below the value of 3, which infers no multicollinearity issues. Furthermore, the values of R² and Q² denote sound results concerning the in-sample relevance and predictive power (Hair et al. 2019; Henseler et al. 2014). Accordingly, the results presented in Table 4 reflect a fit statistical model.

Table 4. Structural model and hypothesis testing.

Effects	Relations	β	t-Statistics	f^2	Decision
Direct					
H1	DTL → OAG	0.213	4.682 ***	0.131	Supported
H2	OAG → DTR	0.372	5.725 ***	0.145	Supported
H3	OAG → BMI	0.215	2.747 **	0.078	Supported
Interaction					
H4	OAG*KTR → BMI	0.348	1.171 *	0.161	Supported

$R^2_{OAG} = 0.36 / Q^2_{OAG} = 0.17$
 $R^2_{DTR} = 0.55 / Q^2_{DTR} = 0.28$
 $R^2_{BMI} = 0.62 / Q^2_{BMI} = 0.41$
 SRMR: 0.025; NFI: 0.917
 * 0.05, ** 0.01, *** 0.001.

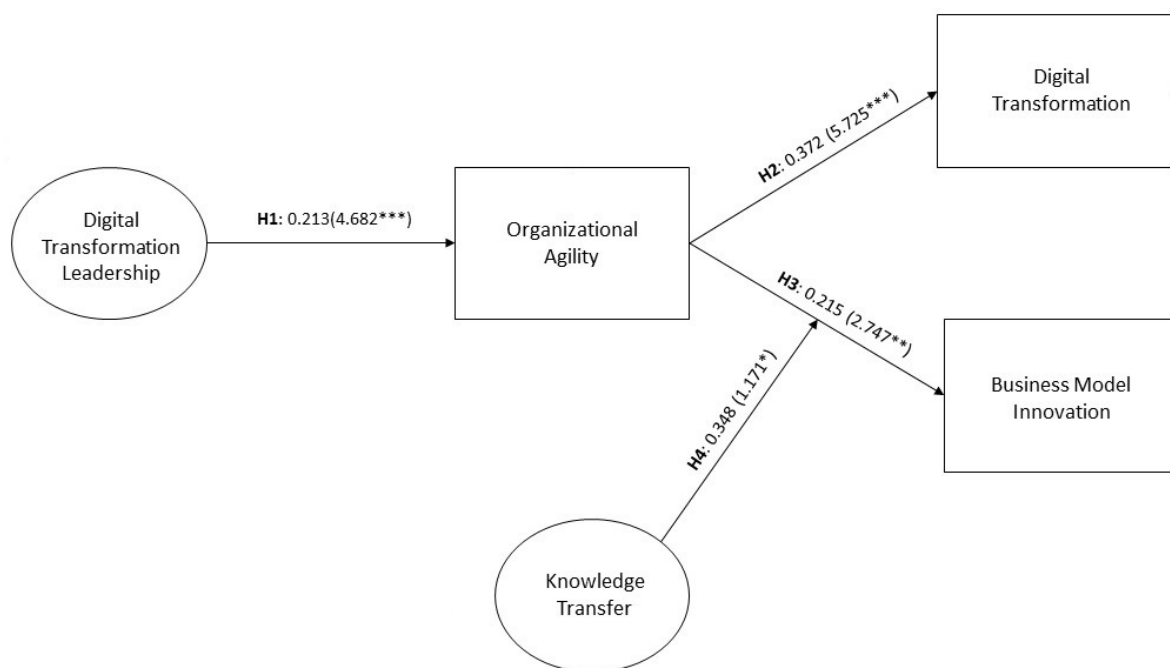


Figure 2. Path diagram. Notes: * 0.05, ** 0.01, *** 0.001.

As per the results illustrated in Table 4, the direct and significant positive impact of digital transformation leadership (DTL) on organizational agility (OAG) is proven ($\beta = 0.213$, $t = 4.682$), indicating support for Hypothesis 1. Likewise, the relationship between organizational agility (OAG) and each of digital transformation (DTR) and business model innovation (BMI) is found to be statistically significant ($\beta = 0.372$, $t = 5.725$ and $\beta = 0.215$, $t = 2.747$, respectively), indicating support for Hypotheses 2 and 3. Finally, the moderation effect of knowledge transfer (KTR) is found to be significant ($\beta = 0.348$), resulting in acceptance of Hypothesis 4.

5. Discussion of Results

In accord with the aim of investigating the impact of digital transformation leadership on organizational agility, Hypothesis 1 was supported, showing consensus with extant literature (AlNuaimi et al. 2022; Giacosa et al. 2022) while reflecting unique implications in the Middle East region and specifically in Lebanon. This reconciles with New Institutionalism Theory, which assumes that the skills of leaders are the basis for elevating change at the level of institutions, as SMEs need the presence of transformational leaders who promote change and make sure that their subordinates are well prepared to take the necessary actions in response to the challenges in a fragile work setting.

This is further related to the positive impact of organizational agility on digital transformation, as indicated in Hypothesis 2. Our current findings show compliance with the existing literature, e.g., Troise et al. 2022 and Ghasemaghahi et al. 2017, implying that organizational agility facilitates and expedites the transition toward the digitalization of SME operations. Agility helps SMEs to achieve greater alignment among data, employee utilization, business operations, and customer requirements. Embedded in New Institutionalism Theory, an agile organization is better equipped to embark on digital transformation, as it empowers change functions throughout the entire enterprise to actively pursue the most advantageous amalgamation of technological facilities.

Likewise, Hypothesis 3 is supported, stating that organizational agility enhances business model innovation within the context of SMEs in Lebanon. Notably, a few scholars have found similar results in different contexts (Chakravarty et al. 2013; Liao et al. 2019). Within the realm of New Institutionalism Theory, organizational agility serves as a key to business model innovation, implying that within an agile SME characterized by a technology-driven and growth-oriented mindset, subordinates become increasingly motivated to identify opportunities and actively engage in generating customer value through innovative business models.

Our current findings additionally suggest that the linkage between organizational agility and business model innovation can be influenced by knowledge transfer, resulting in the acceptance of Hypothesis 4. Linked to the framework of this research paper, the results show that knowledge transfer undertakes a moderating effect, meaning that the presence of SME members who are willing to disseminate useful content to others and deliver inputs that help in the problem-solving process can strengthen the impact of organizational agility on the development of innovative business models, a result that is consistent with the extant literature (e.g., Li et al. 2022; Bashir and Farooq 2019).

This study's findings validate all four hypotheses, fortifying a resolute alignment with the prevailing literature and accentuating the indispensable role of digital transformation leadership in stimulating organizational agility within SMEs. The research underscores the impact of agility on digital transformation and business model innovation within the context of Lebanese SMEs, reinforcing its standing as a facilitator for adaptability and growth in the post-pandemic era. Adherence to New Institutionalism Theory reinforces the impact of the argument, unveiling the role of transformative leaders in propelling change and empowering subordinates to confront adversities head-on in a continually changing work environment.

6. Conclusions and Implications

This study adds academic value to the existing literature by shedding light on the practices of SMEs that facilitate a successful transition towards digital transformation and the creation of innovative business models in the post-pandemic age. Importantly, it fills a gap in the research field, as no previous studies have specifically addressed this context before. Thus, this research helps in exploring the implications of leadership and digital transformation within SMEs, particularly in the post-pandemic Middle East region and Lebanon. As a part of the research topic titled: "Innovation Management of Organizations in the Digital Age", this paper derives useful results. New Institutionalism Theory is employed in this research work to prove how "digital leaders" who assume a

technology-oriented mindset, create cooperative networks for finding and applying digital competencies, seek to build up others, provoke trust, and serve as moral agents can help SMEs to develop an agile culture which in turn facilitates the transition toward digitalizing their operations. Moreover, the results of this study emphasize that the absence of agility jeopardizes a firm's ability to create and sustain innovative business models that deliver a unique value proposition to the customers. This has become more critical in the post-pandemic age, where SMEs are supposed to find means to digitalize their practices, become more innovative in a highly competitive market, and respond to rapid changes in a volatile environment. The results of this study emphasize the vitality of SME leaders' characteristics in considerably hindering or enhancing the firm's overall ability to cope with and enable digital change as well as eliciting the organizational members' ability to capture, develop, and deliver unique value to the customers and other stakeholders. These conclusions are linked to the Path–Goal Theory, indicating that the process of knowledge transfer serves a moderating role on the aforementioned relationship. This means that having SME members who are enthusiastic about sharing valuable information with others and providing input to aid in problem-solving practices will ultimately enhance the influence of organizational agility on the advancement of innovative business models.

These outcomes hold insights for SME managers aiming to enhance their responsiveness to the insecure environment which is surrounded by evolving competitors, unstable economic and health conditions, and a rapid pace of technological advancements, particularly within the Lebanese context. Linked to New Institutionalism Theory, SME leaders are the key players for elevating change through their transformational characteristics. These leaders amplify organizational agility by creating successful connections with subordinates and prompting them to prioritize organizational interests in order to become more operative in a vigorous, changing, and indeterminate work environment in the post-pandemic era. Such transformational leaders make their subordinates well-prepared to respond to the changes in a fragile environment by following trajectories directed toward making their organizations more agile and fortified. When SME leaders concoct an agile culture, digital transformation becomes easier and smoother. Moreover, in an agile SME where leaders have a technology-driven and growth-oriented mindset, subordinates become more encouraged to recognize opportunities and participate in creating value for customers through innovative business models. Moreover, knowledge transfer is found to be crucial for SMEs which aim to expedite the art of enhancing their advantage and value creation by formulating simultaneous and supportive changes to their business model. Hence, the findings of this study provide empirical evidence regarding the post-pandemic digital transformation trend for SMEs.

The role of SME managers and organizational systems in fostering a culture of agility and knowledge sharing stands as the bedrock for SMEs' success in navigating the challenges posed by the post-pandemic era. As the Lebanese economy grapples with fragility amid a confluence of unstable economic, social, and political conditions, the imperative of embracing digital transformation and innovation becomes undeniable. By strategically implementing tactics that prioritize a digital inclination and encourage knowledge exchange among employees, managers empower SMEs to stay at the forefront of emerging technologies and effectively address the fast-paced changes in the market landscape. This approach not only bolsters SMEs' performance, it allows them to create unique and innovative value propositions that resonate with customers, thereby positioning these businesses as key contributors to the economic revival of Lebanon. Therefore, placing SME managers and organizational systems at the core of the digital transformation agenda constitutes a compelling argument that will usher in a new era of prosperity and resilience for SMEs in Lebanon.

In simple words, we stress the role of SME managers and organizational systems (i.e., systematic knowledge transfer) in providing the vital culture and work setting for the agility pillar that in turn enables a smooth transition for SMEs to adopt digital change and create an innovative business model to better handle market changes, uncertainty, and

fierce competition, nourishing the Lebanese economy which has become highly fragile as a result of the pandemic and the unstable economic, social, and political conditions in the region.

Due to the comparatively small number of employees working for SMEs in Lebanon, managers can implement tactics and take initiatives that are deployed toward fostering a digital inclination along with sufficient knowledge sharing among organizational members. This can greatly help SMEs meet their needs with regard to emerging technologies, improve their performance, create innovative and unique value to the customers, and overcome the size-related limitations they usually face while doing business in the current volatile environment.

Based on the aforementioned findings, this paper answers the two main research questions posed in the introduction: To what extent does digital transformation leadership impact organizational agility? Our findings indicate a clear positive relationship, with effective leadership enhancing the agility of organizations in adapting to change. Additionally, the study explains how this positive influence contributes to the successful adoption of digital practices and the development of innovative business models within Lebanese SMEs. The results affirm that organizational agility plays a vital role in facilitating both the integration of digital practices and the creation of innovative business models, fostering growth and resilience in these small businesses.

In summary, this research presents a framework for the centrality of digital transformation leadership, organizational agility, and knowledge transfer in shaping SME success. Its contributions bridge theory and practice, providing a roadmap for SMEs to navigate the digital era and embrace innovation-driven paradigms. With far-reaching implications for organizational growth and economic advancement, this research holds promise for fostering vibrant, innovation-centric SME ecosystems, propelling Lebanon's economy towards a trajectory of enduring prosperity in the post-pandemic age.

7. Limitations and Future Research

The current research is associated with a number of limitations. Remarkably, the research model can be further analyzed by deploying other relevant factors such as organizational culture, human resource strategy, empowerment, coping mechanisms, and employee pushback. Future research can further expand the generalizability of the results by conducting a longitudinal data collection approach to examine the variations in time and the subsequent changes in SMEs' digital transformation and business model innovation progress. This can practically provide a more comprehensive understanding of the effectiveness of the aforementioned digitalization strategy. Alternatively, future studies could follow a qualitative methodology and conduct interviews with SME decision-makers to gain insights into the challenges that impede the digital transformation process in the post-pandemic age.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Data supporting the findings of this research are available upon request from the corresponding author due to privacy/ethical restrictions, as the raw data contain the names of the selected organizations.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Questionnaire items:

Digital Transformation Leadership	
1.	Our leaders inspire all members with the digital transformation plans for our organization.
2.	Our leaders provide a clear digital transformation vision for the organization's members to follow.
3.	Our leaders motivate team members to work together for the same digital transformation goals.
4.	Our leaders encourage all members to achieve digital transformation goals for our organization.
5.	Leaders in my organizations act by considering the digital transformation beliefs of all members.
6.	Our leaders stimulate all members to think about digital transformation ideas.
Organizational Agility	
7.	We can rapidly respond to customers' and government's needs.
8.	We can rapidly adapt production, process, and activities to meet demand fluctuations.
9.	We can cope with problems from suppliers and partners rapidly.
10.	We rapidly implement decisions to face market and government changes.
11.	We continuously search for forms to reinvent or redesign our organization.
12.	We see the market and government changes as opportunities for rapid capitalization and growth.
Digital Transformation	
13.	In my organization, we aim to digitalize everything that can be digitalized.
14.	In my organization, we collect large amounts of data from different sources.
15.	In my organization, we aim to create more robust networking with digital technologies between the different business processes.
16.	In my organization, we aim to enhance an efficient customer interface with digitality.
17.	In my organization, we aim at achieving information exchange with digitality.
Business Model Innovation	
18.	In my organization, business model innovation requires enhancing the components of the entire business model.
19.	In my organization, business model innovation requires evaluating and changing in the business model components.
20.	In my organization, the business model changes have helped us gain a competitive advantage.
21.	In my organization, business model innovation is derived from the strategy.
22.	In my organization, business model innovation is driven by market needs and circumstances.
23.	In my organization, there is/are team(s) that are involved in business model experimentation and innovation.
24.	In my organization, in-depth analysis takes place before starting to change the business model.
Knowledge Transfer	
25.	In my organization, knowledge sharing contributes to the improvement of our knowledge level.
26.	In my organization, sharing knowledge with colleagues is faster than doing work on our own.
27.	I am always willing to share my knowledge with my colleagues.

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