

## INTERNATIONAL JOURNAL OF ORGANIZATIONAL LEADERSHIP

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journal homepage: <https://www.ijol.cikd.ca>



# Do Generative Leadership and Digital Literacy of Executive Management Help Flourishing Micro and Small Business Digital Maturity?

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### ABSTRACT

Today, every firm and organization must digitally transform in order to survive and deal with increasing competition and dynamic market conditions. Digital transformation is not easy to achieve, and many factors play an important role in the successful digital transformation of firms. Leaders' leadership styles and characteristics play a crucial role in digital transformation. This study examines the effects of generative leadership and digital literacy of executive management on the digital maturity of micro and small firms based on the Upper Echelons Theory. Sub-dimensions of digital maturity are also considered and searched to provide a more detailed analysis. The research utilized a survey method and was conducted with 121 upper, middle, and first-line managers of 93 micro and small-size firms operating in the Marmara Region of Turkey. Frequency, factor, regression, and validity and reliability analyses through the SPSS package program were used. The results are two folds. First, generative leadership and digital literacy of executive management help flourish digital maturity when searched independently. Second, the study results indicate that the digital literacy of executive managers has a mediating effect on the relationship between generative leadership and digital maturity. Furthermore, the study proves the mediating effect on digital maturity's technological, strategic, and cultural maturity sub-dimensions. With these findings in micro and small businesses, the study comprehensively contributes to the current knowledge in this domain.

### Keywords:

Digital maturity, Generative Leadership, Digital literacy of executive management

### Received

19 September 2022

### Received in revised form

23 October 2022

### Accepted

01 November 2022

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## Introduction

Resulting from market upheaval and gaps in organizational requirements and procedures, Digital Transformation (DT) was happening at a fast pace in both public and private enterprises. Especially with Covid-19, in the last two and a half years, it has become a vital requirement or necessity rather than an option. It is an essential market requirement for the organizations' survival (Nakku et al., 2020). Digital transformation is a process that enhances an organization by initiating significant changes via information and communication technologies (Vial, 2019). To elaborate on this definition, digital transformation concerns the businesses' technology, people, and organizational aspects. Thus, it indicates a total change and paradigm shift associated with strategy, vision, leadership, digital awareness and capabilities, and perceiving and capturing opportunities. Previously, it was reported that digital transformation provides competitiveness, increase in sales and revenue (Matt et al., 2015), supply chain efficiency (Accenture, 2017), cost reduction (Verhoef et al., 2021), better or improved productivity (Silva, 2017), and innovativeness and growth (Scuotto et al., 2022) for business enterprises. With Covid-19 uncertainties and disruptions in all business functions, it has become a survival issue for obvious reasons. Especially in small businesses, digital transformation might create many opportunities to deal with ever-increasing competitive threats, cut costs, meet customer expectations, prove decision-making, and, most importantly, reduce the digital divide they had most suffered for decades against mid or large-size companies. Especially the adoption of third platforms technologies and systems is affordable and suitable for small businesses since they have limited resources in terms of capital, technology, human resources, and skilled technical personnel.

In the digital transformation journey, the final goal or results should be improved and increase digital maturity. Thus, roadmaps and rubrics to evaluate the current state of the company's Information Technology (IT) and Information and Communications Technology (ICT) utilization are required as a first step. In this sense, digital maturity models have been developed as instrumental tools for measuring the present state of the company's digital transformation journey. Williams et al. (2019) reviewed important digital maturity models and discovered some common key points. These models often focus on the capabilities and skills of the organization, assess the present situation, identify potential improvement areas, and draw a path for digital transformation.

One of the most important motivators of digital transformation is the leadership style. As it is widely discussed in the literature, leaders and leadership styles play a significant role in the initiation and successful continuation of the lengthy and complex digital transformation process (Bolte et al., 2018). Like any IT or Information Systems (IS) project, executive management's support will be vital for successful digital transformation. The digital transformation process of organizations necessitates a leadership style that fosters innovation, organizational adaptation, and high performance over time. Surie and Hazy (2006) indicate generative leadership as the type of leadership that shows these characteristics. Generative leadership is considered one of the influential and innovative leadership types because this type of leader seizes and senses opportunities and brings to their work a powerful blend of knowledge, high energy, creative thinking, and willingness to take action (Klimek et al., 2008). Considering the traditional, pragmatic, explorative, and generative leadership types of Klimek et al. (2008), the generative leadership type draws attention as it emphasizes innovative vision (Çetin & Demirbilek, 2020)

and is also associated with risk propensity (Tuschner et al., 2022), collaborative approach (Gerth & Peppard, 2016; Gilli et al., 2022), cooperative learning (Taylor, 2016), and finding new ways for cooperation.

In the literature, digital maturity studies have generally been handled conceptually, and different researchers put the components of digital maturity in different ways. Studies investigating the factors affecting digital maturity that yield output as an evaluation of digital transformation applications are quite limited (Alma Çallı & Çallı, 2021). On the other hand, leadership characteristics and skills that drive digital transformation have also been the subject of many conceptual discussions. Researchers have put forward the skills that a leader should have, especially in the digital era. This issue has been discussed as digital leadership characteristics in some studies, while some have discussed the qualities a leader should have. These qualities are stated as innovativeness (Scuotto et al., 2022), being employee-oriented (Bolte et al., 2018), cooperative, collaborative (Promsri, 2019), communicative (Cichosz et al., 2020), facilitator (Gilli et al., 2022), willingness for life-long learning (Kaivo-oja et al., 2016), creative (Zhu, 2015), knowledge-oriented (Magesa & Jonathan, 2021), and motivator (Magesa & Jonathan, 2021). In this context, these qualifications that the literature draws attention to can be matched with generative leadership, one of the leadership types of Klimek et al. (2008). To the best of our knowledge, previously, no study has empirically tested and confirmed the generative leadership type, which may be an antecedent of DT. On the other hand, studies examine technology adoption at the firm level. In the Small and Medium-Sized Enterprises (SME) context, it has been revealed that the innovativeness of the manager/owner is the determinant of technology adaptation (AlBar & Hoque, 2019; Dalvi-Esfahani et al., 2018; Mohd Sam et al., 2012). However, digital maturity is multifaceted and does not only include technology adoption.

Regarding technology adoption, the Diffusion of Innovation Theory (Rogers, 1995) and the Technology-Organization-Environment (TOE) framework (Tornatzky & Fleischer, 1990) are important theoretical frameworks utilized for understanding firm-level technology adoption (Giotopoulos et al., 2017; Hatta et al., 2017). TOE proposes that technological, organizational, and environmental factors impact organizational processes (Tornatzky & Fleischer, 1990), while Diffusion of Innovation Theory draws attention to individual factors (Rogers, 1995). Accordingly, individual factors establish a supporting structure for achieving higher levels of digital maturity.

Besides, Upper Echelons Theory proposes that organizational outcomes can be predicted by executive management's managerial or leadership characteristics (Hambrick & Mason, 1984). Highly turbulent and dynamic contexts and disruptive changes such as digital transformation have been challenging executive-level managers (Bolden & O'Regan, 2016; Vial, 2019) and require the introduction of new digital leadership roles and responsibilities (Haffke et al., 2016).

Studies discussing the capabilities needed for digital transformation emphasize the need to blend traditional skills with digital knowledge, literacy, and awareness (Gray, 2018). Digital literacy, which is claimed to increase the reliability of the leader and is considered one of the essential competencies of the digital era, has been examined in technology adoption studies, and different findings have been discovered in different contexts (AlBar & Hoque, 2019; Hashim, 2015; Chatzoglou & Chatzoudes, 2016; Jeon et al., 2006).

Digital/ICT literacy refers to a broader skill set that is considered a critical driver of digital technology adoption decisions. Mutula and Van Brakel (2007) state that ICT literacy includes communication and technical skills. According to Lau and Yuen (2014), digital/ICT literacy comprises a computer, information, and Internet literacy dimensions.

Nevertheless, this multidimensionality has not been taken into account in previous studies, and its impact on digital maturity has not been investigated. Our study, which focuses on individual characteristics within the TOE and Upper Echelons Theory framework, is based on conceptual discussions of leadership qualities needed for DT in the literature. In this context, since generative leadership qualifications and the digital literacy of the leader are proposed enablers of DT, it has been our research interest to examine the direct effects of these two factors on digital maturity.

Based on all the above explanations, the relationships between leadership style and the digital maturity of firms or the relationship between executives' digital literacy and digital maturity have to be further explored. What leadership styles and characteristics support digital maturity has to be studied, especially in small businesses. Based on this reasoning, this study first aims to examine the effects of generative leadership and the digital literacy level of executive management on the digital maturity of an organization. Then the paper focuses on sub-dimensions of digital maturity and tests the relationships between generative leadership and the digital literacy level of executive management. Based on the arguments in the literature, another research question is to explore the impact of digital literacy on the link between generative leadership and digital maturity to observe whether it increases digital maturity when blended with the qualities of the generative leader. Hence, the study also searches for mediating effect of digital literacy on the relationship between generative leadership and digital maturity.

## Literature Review

In order to study the relationships among leadership style, digital literacy, and digital maturity, we will conduct a literature review on all these concepts. We specifically focus on generative leadership since this leadership style would be one of the best suitable and support for digital transformation, as explained and supported in the following section.

### Generative Leadership

According to Klimek et al. (2008), there are four types of leadership styles depending on how generative it is: traditional, pragmatic, explorative, and generative. Generative leadership is considered one of the influential and innovative leadership types. This type of leader seizes and senses opportunities and assures an environment that fosters new ways of cooperation, encourages innovation, and endorses and nurtures new ideas. Managers of this type of leadership transcend beyond the norms set for them and introduce new processes and innovative ideas within the organization (Çetin & Demirbilek, 2020).

Being employee-oriented involves focusing on the growth and well-being of the workforce (Banger, 2018) and is considered a significant property of a digital leader (Bolte et al., 2018). Generative leadership in organizations also fosters high-quality interactions between management and employees, which is vital for the competitiveness and long-term survival of the organizations (Colbert et al., 2008). Previously, it was revealed that digital leaders have an innovative vision (Klein, 2020), and it is the only style that senses and seizes new opportunities

fostering organizational growth and innovations (Rottmann et al., 2016). Furthermore, according to North et al. (2019), sensing and seizing growth potentials are important aspects of digital maturity. Leaders of digitally mature organizations have high capabilities in sensing and capturing growth opportunities, establishing strategy and mentality, and initiating digitally-enabled innovations.

McCarthy et al. (2021) use the term digital architect to define the leadership characteristics relevant to digital transformation. In order to execute operational excellence, a digital architect must identify and construct a digital services platform, think digitally and create operations supported by technology, and investigate and use digital technologies. The utilization of digital technologies and the creation of innovations are essential to bringing forth digital transformation (McCarthy et al., 2021). In addition to innovativeness, agility and organizational learning should be embraced and supported by the leaders (Tanniru et al., 2018). In the digital age, leaders utilizing intellectual stimulation to push staff members to adopt novel approaches to issues and question the current status are required. By encouraging the identification of potential alternative options and supporting the development of a problem-solving-oriented perspective, leaders should assist organizations in decision-making and transformational efforts (Schiuma et al., 2021).

Tuschner et al. (2022) also mention willingness for life-long learning, creativity, entrepreneurial orientation, emotional intelligence, risk propensity, decisiveness, cultural intelligence, and enthusiasm for digitalization as leadership characteristics driving digital transformation. Besides, managing diverse teams, failing, and learning fast (Imran et al., 2020) are important digital transformation competencies. Larson and DeChurch (2020) draw attention to digital technologies altering the characteristic of teamwork and their significant impact on leadership.

In addition to the organizational effects of digital transformation, it is important to deal with the reflection of the dynamics of the pandemic on the working environment (Weritz, 2021). Organizational hierarchies, talent management, and work-life design issues should be handled elaborately by the leaders (Schwarz Müller et al., 2018). In order to cope with change, leaders need to have the cultural and emotional intelligence to maintain cooperation and collaboration among teams (Gerth & Peppard, 2016).

Generative leadership fosters interpersonal ties, encourages widespread participation, takes risks, and utilizes collective intelligence. They are decisive and agile; they listen attentively and communicate clearly. The generative leader's responsibility is to guide and accept responsibility for the collaborative learning of the company (Taylor, 2016). It is, therefore, expected that generative leadership is closely linked with the digital maturity of organizations.

### **Digital Maturity and Digital Maturity Assessment**

The extent of diffusion and adoption of ICT is also defined as the ICT maturity of organizations (Ekuobase & Olutayo, 2016), which has resulted in several pieces of research focusing on assessing the ICT maturity or digital maturity of organizations. Digital maturity models are widely used as a method of self- or third-party evaluation of organizations and as a proactive approach to quality management (Boughzala & Bououd, 2011). The study of Nolan (1973) was the first which define an organization's ICT adoption as a sequence of precisely defined developmental steps. After the stages, including *computer acquisition*, *contagion* (*system*

*development*), *the proliferation of controls*, and *integration (user/service orientation)* were identified by Nolan, two more stages, *data administration management*, and *modeling information flows*, was proposed (Bass, 2011).

Pham (2010) developed a four-element: *infrastructure*, *application*, *human resource*, and *ICT policy* model to evaluate the digital maturity of organizations. Rather than developing a scale, this study developed a set of questionnaire questions that evaluate organizations according to defined maturity levels. Chesher and Skok (2000) proposed *inactive*, *basic*, *substantial*, and *sophisticated user* stages representing no existing utilization of ICTs, use of word processing and some desktop software packages, extending into PC networking and various implementations, and integrated applications and the use of ICT to differentiate services, respectively. Blatz et al. (2018) suggested the dimensions comprising *company culture & organization*, *process and operations*, *data maturity*, *IT infrastructure*, *strategy and leadership*, and *product* to evaluate organizations' digitalization. Triandini et al. (2017) developed an e-commerce maturity framework. The first level represented the adoption of basic features, likewise e-mail, static websites, and social media. The existence of common functionalities characterized the second level; however, they may not be utilized. The third level represented integrated functionalities that facilitate the conduction of third-party business. The fourth level emphasized the strategic role of e-commerce, dependence heavily on e-commerce capabilities, and new business processes. Valdez-de-Leon (2016) developed a digital maturity model assessing the *strategy*, *technology*, *organization*, *innovation*, *operations*, *customer*, and *value chain* aspects. Maturity levels based on the evaluation of these aspects were defined as follows: *not started*, *initiating*, *enabling*, *integrating*, *optimizing*, and *integrating*.

Zhang et al. (2008) proposed a multi-dimensional scale for IT adoption, including sub-dimensions of *IT architecture*, *IT infrastructure*, *IT human resources*, and *IT relationship resources*. Zhang et al. (2008) approached the phenomenon from a resource-based perspective, which posits the availability of valuable, uncommon, and idiosyncratic resources critical to a company's performance improvement (Barney, 1991). Resource-Based View (RBV) asserts that comparative advantage can be gained by assembling a unique set of resources (Dhanaraj & Beamish, 2003; Lu et al., 2010), including dynamic capabilities. Hence, IT as a resource increases operational efficiency, coordination, integration, and performance, and the effect cannot be duplicated because it is the learning system. Besides, the interaction between IT and business people has a remarkable and inimitable effect (Bhatt et al., 2019). Accordingly, many researchers conceptualized digital capabilities by proposing several dimensions.

According to Bharadwaj (2000), IT-based resources are categorized as physical IT infrastructure, human IT resources integrating technical and managerial capabilities, and intangible IT-enabled resources. ICT-based capabilities might be internally-oriented or externally oriented (Neirotti et al., 2018). Internally-oriented capabilities are related to utilizing ICTs, such as Enterprise Resource Planning (ERP) systems, for integrating internal processes. Although ERP is considered a mature technology, SMEs still reflect limited capabilities to integrate internal processes (Neirotti et al., 2018). The externally-oriented capabilities are associated with using ICTs to develop innovative business models and products, e-commerce efforts, conduct Customer Relationships Management (CRM), and supply chain practices (Borges et al., 2009).

According to Neirotti et al. (2018), emerging technologies, likewise the Internet of Things (IoT) and data analytics, support internally-oriented and externally-oriented capabilities. However, they result in a high organizational complexity in the case of implementation. On the contrary, ERP, SCM, CRM, and technologies for e-commerce are relatively established technologies that support digital capabilities.

Niemand et al. (2021) developed a singular construct for measuring the level of digitalization of banks. A scale for digital inclusion, which was previously defined as access and utilization of ICT, was developed by (Khairuddin et al., 2021). Khairuddin et al. (2021) proposed that digital inclusion had the dimensions of "social networking", "information searching", "e-commerce", and "e-marketing". Jafvert and Gustafsson (2019) used the dimensions of "customer experience", "operational processes", and "business model" to measure digital capabilities.

Specifically for the Turkey context, a tool was developed to determine the level of digital maturity in a workshop held by the Izmir Development Agency and the Turkish Ministry of Trade and Industry (İzmir Kalkınma Ajansı, 2020). This model, which was developed by taking into account the national business culture and methods, evaluates the level of digital maturity by integrating the dimensions of culture, strategy, technology, processes, and governance (management and employees). It is expected that the parameters determined in this context will be more suitable for this study, which is planned to be carried out in Turkey since it considers local business methods, corporate culture, and self-values. Therefore, in this study, the X-led model was used to measure the level of digital maturity of enterprises (İzmir Kalkınma Ajansı, 2020).

### **Digital Literacy in Executive Management**

Given that digital literacy is a collection of skills and abilities that a person utilizes while dealing with digital technologies (Stordy, 2015), it is likely that as digital literacy improves, usage of digital technologies improves as well (Abedin et al., 2012). If managers assess their organization's degree of digital literacy, they can better lead the workforce for digital transformation (Kozanoglu & Abedin, 2020). The real-life digital transformation projects and literature also suggest that the digital awareness and literacy level of executive managers is another significant factor for the success of digital transformation.

Digital mentality, awareness, attitudes, and behaviors are interrelated values that contribute to developing digital skills. Accordingly, it can be concluded that leaders with a digital mindset and who are generative are more likely to develop digital skills. Digital literacy is considered a critical capability for the survival of companies in the digital era (Eshet, 2004) and an essential facet of digital transformation (Liley et al., 2017; Manyika et al., 2017). Continuous improvement of digital skills with structured development programs should be one of the primary goals in achieving a high level of digital maturity (North et al., 2019).

### **Development of Hypotheses and Research Model**

Personal curiosity and being open-minded are considered major leadership characteristics in the digital environment (Day, 2011). Leaders driving DT should be facilitators and communicators (Gilli et al., 2022; Magesa & Jonathan, 2021; Schiuma et al., 2021), creative and visionary (Gilli et al., 2022; Zhu, 2015), knowledge-oriented (Klein, 2020), collaborative

(Gilli et al., 2022; Promsri, 2019), enthusiastic and motivator (Magesa & Jonathan, 2021) and should organize the change and increase the awareness related to the benefits of DT practices (Cichosz et al., 2020). Besides, innovativeness resulting in knowledge creation increased market accessibility, and new products/services are considered the most critical component of digital development (Magesa & Jonathan, 2021; Scuotto et al., 2022).

In this context, the previous literature has conceptually discussed the leadership characteristics and skills that drive business enterprises' digital transformation and digitalization efforts. Since a large stream of research has mainly focused on the necessary leadership characteristics (Henderikx & Stoffers, 2022). Emphasizing that traditional leadership characteristics are insufficient in the digital era (Kaivo-oja et al., 2016), the leader's innovativeness and willingness, the ability to establish interactive relationships, and the ability to find creative solutions and be cooperative are accepted more significantly. In prior studies, innovativeness has been frequently investigated as an individual characteristic of the leader fostering the adoption of different technologies. Personal innovativeness in the context of digital technologies is known as the willingness to use new technology (Agarwal & Prasad, 1999), and previously, leaders' innovativeness was explored as a determinant of IT adoption behavior (AlBar & Hoque, 2019; Dalvi-Esfahani et al., 2018; Ghobakhloo et al., 2011; Kareen et al., 2018; Mohd Sam et al., 2012). On the contrary, a few studies unexpectedly found insignificant innovativeness results (Cho, 2006; Safari et al., 2015). However, those studies revealed empirical evidence for different contexts and the firm-level adoption and utilization of other types of technologies rather than the extent of their DT practices. Since DT has social or human aspects in addition to technical aspects, digital maturity assessment encompasses technological, strategic, cultural, managerial, process, and employee maturity dimensions.

However, to the best of our knowledge, there is no study investigating the effects of different leadership styles on digital maturity or other components. For this reason, in this study, effective and prominent leader characteristics were first determined through the studies discussing the essential leadership qualities for digital transformation. We then matched these characteristics with different leadership styles and explored that generative leadership characteristics are more relevant for DT practices.

Furthermore, digital transformation can only be accomplished through repeated interactions across the entire business, not as a consequence of the initiatives of a single person. It is claimed that generative leadership is superior to other leadership styles because it emphasizes interactive relationships, creates new opportunities, and encourages successful innovations, agility, and responsiveness to turbulent environments (Gruzina et al., 2019). However, prior studies have never tested this conceptually proposed relationship. Consequently, it has been our research interest to empirically test the effect of generative leadership on digital maturity based on the discussions in the literature. Based on these arguments in the literature, the following hypothesis is proposed:

*H<sub>1</sub>: Generative leadership has a positive effect on the digital maturity of organizations.*

Digital orientation, which is the purposeful strategic positioning to benefit from digital technologies, includes market orientation, learning orientation, and entrepreneurial orientation. This positioning encompassed the attitudes and behaviors that promote the creation and



application of market insight, proactive innovation, and willingness to accept novel concepts (Quinton et al., 2018).

In addition to environmental factors, organizational capabilities, individual characteristics and skills, and internal value evaluation are determinants of digital orientation (Quinton et al., 2018). Using the TOE framework, Kim et al. (2015) explored that IT expertise and top management's knowledge are significant indicators of e-business capability.

Previous studies emphasized owner/manager as one of the dominant factors affecting technology adoption (Alshamaila et al., 2013). The level of IT knowledge of the owners/managers was explored as a significant antecedent of the adoption of digital technology (Michaelidou et al., 2011; Quinton et al., 2018). Leaders' lack of familiarity with IT diminishes their awareness of the benefits of digitalization and, in turn, affects the technology decisions and the development of an organizational culture toward digitalization (Mohd Sam et al., 2012). The link between digital technology adoption and technology skills was also confirmed by (AlBar & Hoque, 2019; Hashim, 2015; Jeon et al., 2006). Nevertheless, some studies revealed contradictory findings by exploring insignificant effects (Chatzoglou & Chatzoudes, 2016; Dalvi-Esfahani et al., 2018; Mohd Sam et al., 2012).

In this context, in addition to the mixed findings in the literature, previous studies have generally focused on the technical dimension of digital literacy. The terminology for digital technology abilities differs. Information, computer, ICT, technology, digital, and network literacy are used frequently and interchangeably (Ongardwanich et al., 2015).

In contrast to IT knowledge, digital literacy refers to a broader skill set that is considered an important driver of digital technology adoption decisions. Mutula and Van Brakel (2007) state that ICT literacy encompasses communication and technical skills. Based on Lau and Yuen (2014), digital/ICT literacy is an umbrella concept including computer, information, and Internet literacy dimensions: *Information literacy*: One's capability of being aware of their information requirements, evaluating the quality of information, exploring and using the information effectively (Catts & Lau, 2008). *Computer literacy*: Being knowledgeable about computers, and using this knowledge for the efficient use of computers and related applications (Oliver & Towers, 2000). *Internet literacy*: Internet literacy refers to having basic skills for Internet use and capabilities of seeking, gathering, understanding and assessing online content (Kim & Yang, 2016).

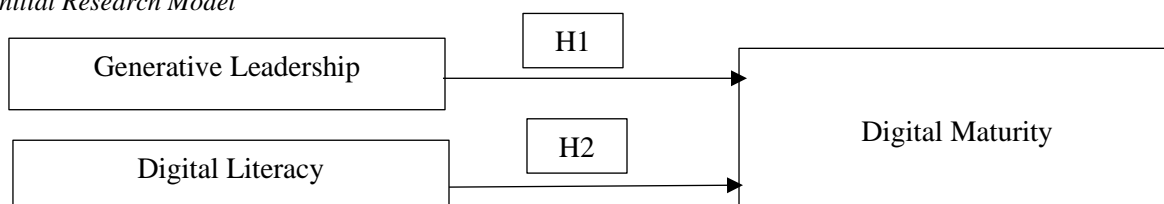
In this context, it is important to evaluate the measurement of digital skills multi-dimensionally, and this approach was considered in this study. Furthermore, previous studies usually focused on adopting particular technologies (Chatzoglou & Chatzoudes, 2016; Dalvi-Esfahani et al., 2018; Hashim, 2015; Jeon et al., 2006) rather than measuring the extent of digital transformation or digital maturity. Hence, digital skills should be evaluated from a broader perspective, including the leader's information, Internet, and computer skills. Although some studies considered digital skills from a broader perspective, the general focus of those studies was on investigating the link between the digital skills of the owner/manager and the ICT adoption or its extent. However, the examination of digital maturity or its dimensions was neglected (Alma Çallı & Çallı, 2021). Based on arguments in the literature, the following hypothesis is proposed:

*H<sub>2</sub>: Digital literacy of executive management has a positive effect on the digital maturity of organizations.*

Based on the two proposed hypotheses, the following research model (Figure 1) is proposed initially:

**Figure 1**

*Initial Research Model*



It is emphasized that traditional leadership features should be blended with new digital leadership features for digital transformation to succeed in business enterprises (Gray, 2018). Prior studies that investigated these leadership qualities from a multidisciplinary perspective have discussed the characteristics that these leaders should have, emphasizing that they are leaders with different attitudes and behaviors and have additional qualifications (El Sawy et al., 2016; Larjovuori et al., 2018). Digital maturity is a multi-dimensional concept and has been conceptualized differently by different researchers. These mechanisms, which help to determine the position of the business in terms of different dimensions in its digital transformation journey, draw attention to the talents and skills of the leader (North et al., 2019). Sufficient skills which are updated and developed frequently via learning are considered critical elements for managing resources for DT, increasing digital market presence, developing digitally-enabled processes and business models, and developing a digital mindset within the organization (North et al., 2019).

Hence, knowledgeable, adaptive, enabling, and technology-aware leadership is required (Schiuma et al., 2021; Tanniru et al., 2018), and employees are more inclined to accept innovations and new digitally-enabled business models when their leaders have a high level of digital skills (Erhan et al., 2022). Previously, digital knowledge & literacy was proposed as significant leader quality enabling and driving digital transformation (Abbu et al., 2022; Karakose et al., 2021; Promsri, 2019). According to (Ngayo Fotso, 2021; van Laar et al, 2017), digital skills are one of the core leadership skills required in the twenty-first century. Leaders' trustworthiness enhances when they have the appropriate skills and experience (Yukl, 1998).

Although digital literacy has been emphasized in previous studies, it has not been empirically tested how it plays a role in the link between other leadership skills and digital transformation outcomes such as digital maturity. Other leadership qualities that studies frequently mentioned are knowledge share, innovativeness, collaborative, communicative, and adaptability. In this respect, these qualities, which we can match with generative leadership, basically formed the basis of the following hypothesis, how the digital maturity output of the generative leader will be when the digital literacy skills are high.

In this respect, we aimed to test the impact of productive leadership on digital maturity by matching these characteristics with generative leadership. Along with the fact that this subject is a separate literature gap, the need to empirically test how digital literacy plays a role in this relationship is another literature gap. For this reason, we determined as one of our research

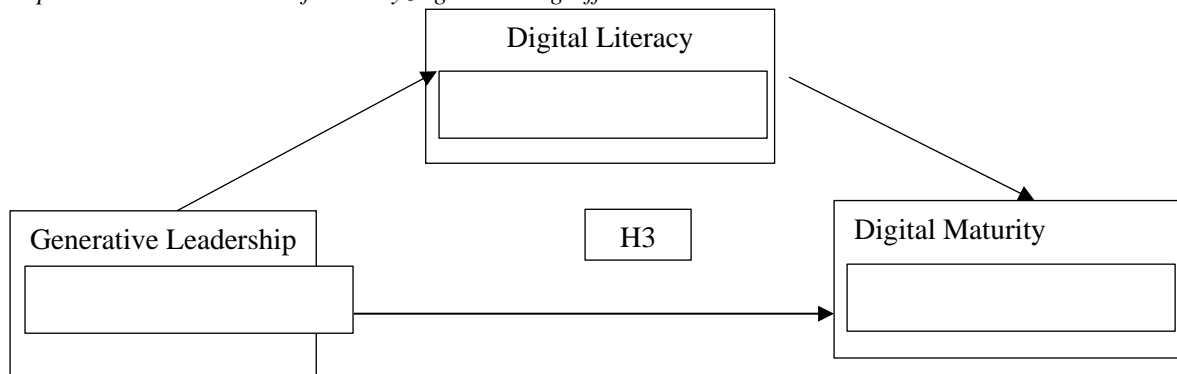
questions what kind of digital maturity output the generative leader would give in the case of high digital literacy skills and suggested the following hypothesis.

*H3: Digital literacy of executive management has a mediating effect on the relationship between generative leadership and the level of digital maturity of organizations.*

Based on hypothesis 3, the research model in Figure 2 is proposed to reveal relations among generative leadership, digital literacy, and digital maturity in micro and small businesses.

**Figure 2**

*Expanded Research Model for Analyzing Mediating Effect*



## Method

### Sample and Data

This survey was conducted on managers of micro and small firms operating in the Marmara Region of Turkey. This area is economically the most developed part of the country, and a considerable number of small businesses are located. Upper, middle, and first-line managers are aimed for this study because they have more information about the procedures and processes of their organization and work more closely with top management to evaluate their organizations and executive-level managers better than the employees. Non-probability sampling was employed using a convenience sampling approach because a sampling frame consisting of whole members and their details was not obtainable as managers of small businesses were aimed in this study. Non-probability sampling is preferable, as randomization is impossible when working with large populations (Etikan et al., 2016). Respondents from 95 firms filled out 137 questionnaires. However, 16 forms were eliminated because they did not meet the requirements of the survey, which indicate that managers should fill out the form and more than 85 % of the forms should be completed. So, data obtained from 121 managers of 93 firms for this exploratory study in progress have been analyzed through SPSS 21.00 Statistical Package Program and PROCESS Macro developed for SPSS.

### Instruments

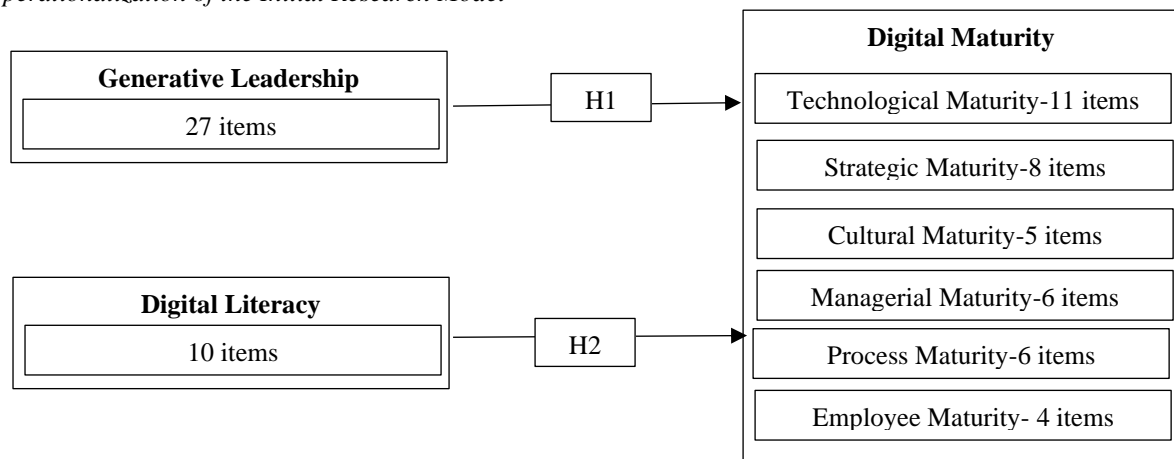
In order to operationalize the proposed research model, different scales developed in previous studies are used. Generative leadership is measured through 27 item-scale developed by Çetin and Demirbilek (2020), and digital literacy is measured by ten item-scale (Lau & Yuen, 2014). Participants were asked to evaluate their executive management's generative leadership and digital literacy level on a five-point Likert-type scale, at which 1-represents Never and 5-Always. Items such as "*Most of the managers in top management activates the discovery process of employees*" (generative leadership) and "*Most of the managers in top management*

are able to collect/retrieve information in digital environments" (digital literacy) would be given example items to measure generative leadership and digital literacy level of executive management in the organization.

To measure digital maturity, 40 item-scale representing six dimensions (strategic maturity, technological maturity, processes maturity, cultural maturity, governance maturity, and digital talent maturity) was developed benefiting from a report prepared for İzmir Kalkınma Ajansı (İzmir Development Agency, 2020). Participants were also asked to evaluate their organizations in the context of strategy, technology, culture, governance, processes, and talented person to measure the overall digital maturity of their firm. Digital maturity items, like "Performance indicators consistent with digital transformation are used", were scored on a six-point-Likert type, at which "1" represents "Absolutely not suitable for our organization", and "6" represents "Absolutely suitable for our organization". The research model after operationalization is presented in Figure 3.

**Figure 3**

*Operationalization of the Initial Research Model*



## Findings

### Demographic Statistics

After analyzing our data with SPSS, detailed demographics of respondents and organizations are displayed in Table 1.

**Table1**

*Demographics of Organizations and Respondents*

Organizations' Demographics		Frequency	Percentage
Industry	Manufacturing	40	43
	Service	40	43
	Trade	13	14
Size	1-9 Employees	22	23.7
	10-50 Employees	71	76.3
Annual Sales	0-5.000.000 TL	58	62.4
	5.000.001-50.000.000 TL	30	32.3
	50.000.001-250.000.000 TL	3	3.2
	250.000.001TL and over	0	0
	Missing	2	2.2
Life Span	0-4 years	19	20.4
	5-9 years	28	30.1
	10-14 years	24	25.8
	15-19 years	10	10.8
	20-29 years	7	7.5
	30-49 years	3	3.2
	50 years and over	0	0
Missing	2	2.2	

Respondents' Demographics		Frequency	Percentage
Gender	Female	34	28.1
	Male	84	69.4
	Missing	3	2.5
Education	Primary School	1	0.8
	High School	9	7.4
	College	76	62.8
	Graduate	34	28.1
	Missing	1	0.8
Age	21-30 years old	33	27.3
	31-40 years old	42	34.7
	41-50 years old	34	28.1
	51-60 years old	11	9.1
	61 years old and over	0	0
	Missing	1	0.8
Tenure	0-1 years	8	6.6
	1-4 years	37	30.6
	5-9 years	47	38.8
	10-14 years	12	9.9
	15-19 years	7	5.8
	20 years and over	8	6.6
	Missing	2	1.7
Statue	Owner/Partner	48	39.7
	Upper-level managers	19	15.7
	Middle-level managers	14	11.6
	First-line managers	40	33.1

### Exploratory Factor Analyses (EFA)

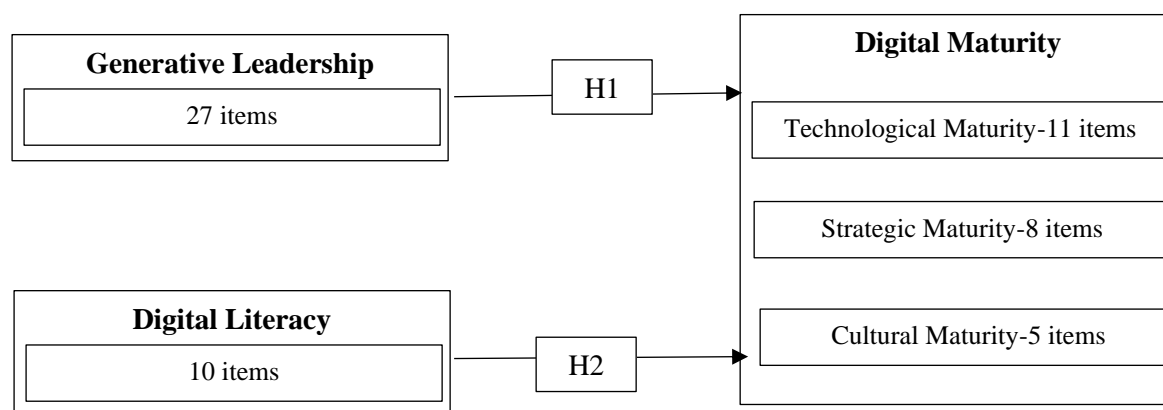
Exploratory Factor Analyses (EFA) utilizing varimax rotation have been conducted on data obtained from 121 respondents. “The exploratory factor analysis is generally used in the early stages of research when there is an insufficient theoretical or empirical basis to hypothesize the number of underlying factors and/or which specific indicators these factors are likely to influence” (Podsakoff et al., 2003, p. 620). Thus, this study uses EFA, which was conducted on managers of micro and small firms for the first time and aimed to reveal relations among generative leadership, digital literacy, and digital maturity. Moreover, as “EFA is generally regarded as a technique for large sample sizes (N), with N = 50 as a reasonable absolute minimum” (de Winter et al., 2009, p. 147), this study with a sample size of 121 utilizes EFA. Based on values greater than one and coefficient values greater than .60, Principal EFA was conducted on data obtained from 121 respondents for the dependent variable (digital maturity) and independent variables (generative leadership and digital literacy) separately. All items of generative leadership and digital literacy were loaded on their corresponding constructs without any cross-loadings. Eight items of digital maturity were eliminated because they did not load on any factor, and the remaining 32 items were loaded on three factors. Seven items of strategic digital maturity and one item of process digital maturity were loaded on the same factor, while three items of employee digital maturity, three of cultural digital maturity, and one item of managerial digital maturity dimensions constituted another factor. Other remaining items were loaded on the same factor, technological digital maturity. Thus, although our starting conceptual digital maturity scale has six dimensions based on the literature, this study revealed three dimensions after our EFA analysis. This may result from using micro and small firms in a developing country, Turkey. Micro or small firms are naturally less likely to be sophisticated in perceiving and practicing digitalization relative to large-scale and developed country-located firms.

Factor analysis results are given in Table 2. Higher Cronbach alpha values ranging between .93–.97 indicate higher reliability of the measurements (Table 2). Moreover, as depicted in Table 2, Composite Reliability (CR) coefficients exceeding .80 and Average Variance Extracted (AVE) estimates exceeding .50 demonstrated adequate evidence for the scales' convergent validity and discriminant validity.

**Table 2**  
*Factor Analyses, Reliability and Validity Analyses Results*

	Rotated Component Matrix <sup>a</sup>		Rotated Component Matrix <sup>a</sup>			
	Independent Variables		Dependent Variables			
	Generative Leadership	Digital Literacy	Technological Maturity	Strategic Maturity	Cultural Maturity	
GL18	.80		TDM9	.81		
GL19	.79		TDM1	.80		
GL5	.77		TDM8	.76		
GL9	.76		TDM7	.74		
GL17	.76		CDM1	.73		
GL10	.76		TDM6	.72		
GL22	.76		CDM5	.72		
GL6	.76		TDM1	.72		
GL16	.75		MDM3	.71		
GL27	.75		PDM5	.71		
GL15	.75		MDM1	.70		
GL25	.74		PDM7	.68		
GL26	.74		MDM4	.68		
GL23	.73		TDM1	.68		
GL20	.72		TDM3	.68		
GL24	.71		PDM1	.66		
GL7	.71		PDM3	.62		
GL21	.70		SDM8		.79	
GL14	.69		SDM5		.78	
GL11	.68		SDM6		.75	
GL13	.67		SDM4		.73	
GL4	.67		SDM2		.73	
GL1	.66		SDM7		.72	
GL8	.64		PDM2		.71	
GL12	.64		SDM3		.70	
GL3	.62		EDM3		.80	
GL2	.62		CDM3		.79	
DL6		.85	EDM2		.76	
DL9		.84	EDM4		.74	
DL8		.81	MDM6		.72	
DL5		.78	CDM4		.72	
DL3		.73	CDM2		.61	
DL7		.72				
DL4		.69				
DL1		.66				
DL2		.64				
DL10		.61				
Cronbach's Alpha Coefficients	.97	.94	Cronbach's Alpha Coefficients	.97	.96	.93
AVE Estimates	.52	.55	AVE Estimates	.51	.55	.54
CR Coefficients	.82	.92	CR Coefficients	.87	.90	.89
# of Items	27 items	10 items	# of Items	17 items	8 items	7 items
Total Explained Variance		64.78	Total Explained Variance			75.29
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 3 iterations.			Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 8 iterations.			
GL=Generative Leadership DL=Digital Literacy			TDM= Technological Digital Maturity	SDM= Strategic Digital Maturity		
			CDM= Cultural Digital Maturity	MDM=Managerial Digital Maturity		
			PDM= Process Digital Maturity	EDM= Employee Digital Quality		

Based on our findings from EFA, we modify and adjust our research model to include three sub-dimensions of digital maturity instead of 6. Research Model After EFA is provided in Figure 4.

**Figure 4***Adjusted Research Model for Hypothesis Testing*

### Hypothesis Testing

To test the hypotheses, regression analyses were conducted. However, before conducting regression analyses, data were aggregated on firm bases since the organization's digital maturity is relevant rather than the managers' digital maturity. So, regression analyses were conducted on data obtained from 93 firms. Moreover, three dimensions of digital maturity were combined and reduced to one higher-order construct, the digital maturity construct, before the regression analyses. To test the H<sub>1</sub> and H<sub>2</sub>, stating the relations between generative leadership, digital literacy, and digital maturity, linear regression analyses were conducted. To test H<sub>3</sub>, indicating the mediating effect of digital literacy on the effect of generative leadership on digital maturity, hierarchical regression analysis was conducted in the direction of Baron and Kenny's (1986) framework, and Hayes's (2018) PROCESS Macro was utilized. The Sobel test was also conducted to test the indirect effect, namely the significance of the mediation effect (Preacher & Hayes, 2004).

The  $\beta$  values obtained at 1st and 2nd steps of regression analyses indicate the significant effects of generative leadership ( $\beta = .66$ ;  $p < .001$ ) and digital literacy ( $\beta = .83$ ;  $p < .001$ ) on digital maturity (Table 3). So, H<sub>1</sub> (*Generative leadership has a positive effect on the digital maturity of organizations*) and H<sub>2</sub> (*Digital literacy of executives has a positive effect on the digital maturity of organizations*) were supported by the analysis findings.

As presented in Table 3, the significant effect of generative leadership ( $\beta = .66$ ;  $p < .001$ ) on digital maturity disappeared ( $\beta = .10$ ;  $p = .226$ ) when digital literacy ( $\beta = .75$ ;  $p < .001$ ) was included in the regression analyses in the 3rd step, which indicates the mediating effect of digital literacy on the relationship of generative leadership to digital maturity of organizations. So, H<sub>3</sub> stating, "*Digital literacy of executive management has a mediating effect on the relationship between generative leadership and the level of digital maturity of organizations*", was also supported by analyses and findings of this study. Although the analysis results utilizing Baron and Kenny's three step-method revealed the mediation effect of digital literacy, more reliable results indicate the mediation effect requires a significant indirect effect of the independent variable on the dependent variable. Some approaches are often used as a supplement to Baron and Kenny's method, such as the empirical M-test (Holbert & Stephenson, 2003), bootstrapping (Stine, 1989), and the Sobel test (Sobel, 1982).

“The Sobel test is utilized to examine the hypothesis in which the relationship between the independent and dependent variables is mediated/affected by a third variable, that is, independent and dependent variables have an indirect relationship” (Abu-Bader & Jones, 2021, p. 47), whether the inclusion of a mediator variable in the regression analysis reduces the relationship between independent and dependent variables (Preacher & Leonardelli, 2020). In this context, to strengthen our results' reliability, the SOBEL test was conducted on 93 observation variables to examine the indirect effect of generative leadership on digital maturity. According to the SOBEL test results presented in Table 3, generative leadership indirectly affects digital maturity ( $z = 6.63$ ;  $p < .001$ ), which also supports our hypothesis, H<sub>3</sub>.

To search which component(s) of digital maturity is/are more dominant in this mediation effect, hierarchical regression analyses were repeated for the three sub-dimensions - technological, strategic, and cultural- of digital maturity, in the direction of Baron and Kenny's (1986) framework.

**Table 3**

*Regression Analysis Results: Mediating Effect of Executive Management's Digital Literacy on the Relationship Between Generative Leadership and Organization's Digital Maturity*

	Independent Variables	Dependent Variable	$\beta$	$p$	R <sup>2</sup>	F
1 <sup>st</sup> Step	Generative Leadership	Digital Maturity	<b>.66***</b>	.000	.43	71.38
2 <sup>nd</sup> Step	Digital Literacy	Digital Maturity	<b>.83***</b>	.000	.69	201.06
3 <sup>rd</sup> Step	Generative Leadership	Digital Maturity	.10	.226	.69	101.82
	Digital Literacy	Digital Maturity	<b>.75***</b>	.000		

Sobel	Value	LL 95% CI	UL 95% CI	S.E.	$z$	$p$
GL→DL→DM	.72	.50	.93	.10	<b>6.63***</b>	<b>.000</b>

Note. \* $p \leq .05$

\*\* $p \leq .01$

\*\*\* $p \leq .001$

GL= Generative Leadership, DL= Digital Literacy, DM= Digital Maturity

As presented in Table 4, the significant effect of generative leadership on technological ( $\beta = .68$ ;  $p < .001$ ), strategic ( $\beta = .64$ ;  $p < .001$ ), and cultural digital maturity ( $\beta = .50$ ;  $p < .001$ ) disappeared when digital literacy was included in regression analyses ( $\beta = .08$ ;  $p = .29$ ) for technological,  $\beta = .17$ ;  $p = .08$  for strategic, and  $\beta = .03$ ;  $p = .76$  for cultural, which also indicates digital literacy of executive level management has a full mediating effect on the relationship of generative leadership to all dimensions (technological, strategic and cultural) of digital maturity in micro and small firms.

SOBEL tests were conducted on 93 observation variables to examine the indirect effect of generative leadership on technological, strategic, and cultural digital maturity. According to the SOBEL test results presented in Table 4, generative leadership affects technological digital maturity ( $Z = 7.39$ ;  $p < .001$ ), strategic digital maturity ( $Z = 5.49$ ;  $p < .001$ ), and cultural digital maturity ( $Z = 4.71$ ;  $p < .001$ ) indirectly, which also provides adequate evidence for mediating effect of digital literacy on the relationship of generative leadership to technological, strategic and cultural maturity dimensions of digital maturity.



**Table 4**

*Regression Analysis Results: Mediating Effect of Digital Literacy on the Relationship Between Generative Leadership and Dimensions of Digital Maturity*

Independent Variables		Dependent Variable	$\beta$	Sig.	R <sup>2</sup>	F
Step-1	Generative Leadership	Technological Digital Maturity	<b>.68***</b>	.000	.46	78.68
		Strategic Digital Maturity	<b>.64***</b>	.000	.40	64.38
		Cultural Digital Maturity	<b>.50***</b>	.000	.24	31.04
Step-2	Digital Literacy	Technological Digital Maturity	<b>.87***</b>	.000	.75	282.92
		Strategic Digital Maturity	<b>.76***</b>	.000	.58	129.78
		Cultural Digital Maturity	<b>.66***</b>	.000	.43	68.95
Step-3A	Generative Leadership Digital Literacy	Technological Digital Maturity	.08	.298	.75	142.16
			<b>.81***</b>	.000		
Step-3B	Generative Leadership Digital Literacy	Strategic Digital Maturity	.17	.085	.59	67.86
			<b>.64***</b>	.000		
Step-3C	Generative Leadership Digital Literacy	Cultural Digital Maturity	.03	.761	.42	34.17
			<b>.63***</b>	.000		

Sobel	Value	LL 95% CI	UL 95% CI	S.E.	z	p
GL→DL→TDM	.82	.60	1.09	.11	<b>7.39***</b>	<b>.000</b>
GL→DL→SDM	.66	.42	0.90	.12	<b>5.49***</b>	<b>.000</b>
GL→DL→CDM	.66	.39	0.94	.14	<b>4.71***</b>	<b>.000</b>

\* $p \leq .05$

\*\* $p \leq .01$

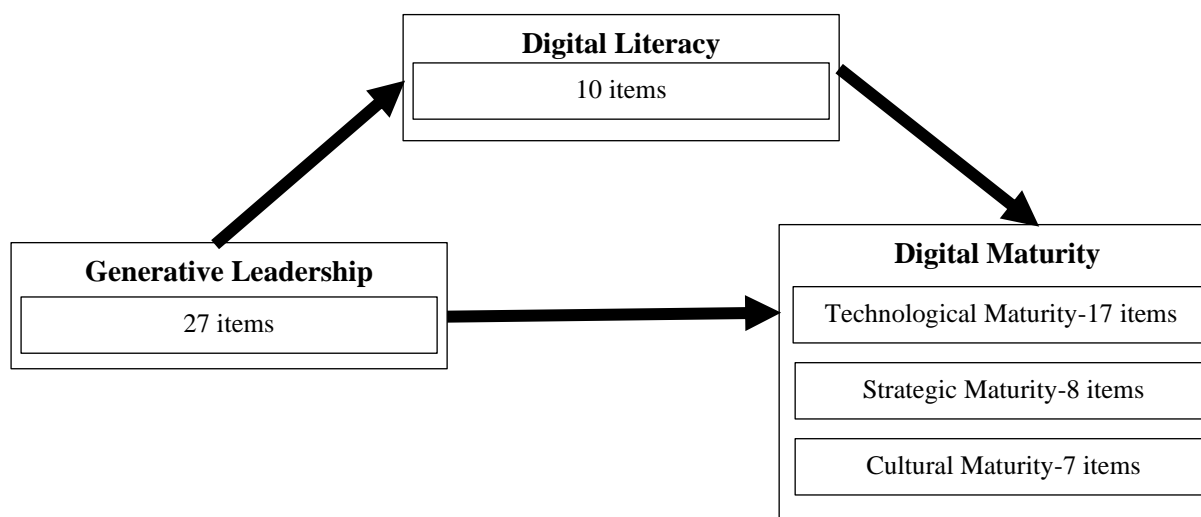
\*\*\* $p \leq .001$

GL= Generative Leadership, DL= Digital Literacy, TDM= Technological Digital Maturity, SDM= Strategic Digital Maturity, CDM= Cultural Digital Maturity

Based on the findings of this study, the research model in [Figure 5](#) was revised:

**Figure 5**

*Revealing Research Model After Mediating Effect Analysis and Hypothesis Testing*



The results of analyses are two folds. First, the data proves that generative leadership and executive digital literacy help increase digital maturity when searched independently. Secondly, further analysis and the results show that when generative leadership and the digital literacy level of executive management are considered together, the digital literacy level of the executive management team has a mediating effect on the relationship between generative leadership and the digital maturity of an organization. Furthermore, detailed hierarchic regression analyses display that the effects of generative leadership on technological, strategic,

and cultural maturity sub-dimensions of digital maturity are mediated by the digital literacy level of executive management. The study contributes to the literature on different capacities. The mediation effect of executive digital literacy on the relationship between generative leadership and digital maturity and subcomponents of digital maturity in micro and small businesses are emphasized more comprehensively in this study.

## Conclusion and Discussion

This study investigated the relations between generative leadership, executive digital literacy, and digital maturity of micro and small businesses and was conducted with 121 managers from 93 firms in Turkey. Based on Upper Echelons Theory, the study proposed that generative leadership and executive digital literacy has an effect on the digital maturity level of organizations. Consistent with the proposed hypotheses (H<sub>1</sub> and H<sub>2</sub>), data obtained from 121 managers of 93 firms exposed that generative leadership and executive digital literacy have a significant and positive effect on the digital maturity level of micro and small firms in Turkey. With further hypothesizing (H<sub>3</sub>) and analysis, the research findings revealed a significant and positive effect of generative leadership on digital maturity is mediated by the digital literacy of executive managers. As a final analysis, the study searches which sub-dimension(s) of digital maturity is/are more significant in this mediation effect, and further comprehensive analyses were conducted. The results show the mediating role of executive digital literacy on the relationship between generative leadership with all three dimensions-technological, strategic, and cultural- of digital maturity of micro and small businesses. Now each of these findings will be discussed and interpreted:

H<sub>1</sub> (*Generative leadership has a positive effect on the digital maturity of organizations*) and was supported by the analysis findings.

These results reveal that generative leadership has a positive impact on the digital maturity level of firms. Based on the literature, generative leadership and the characteristics of generative leaders provide nurturing and supporting environment for digital transformation. Especially in small businesses, generative leaders may have big impact since they are sole decision-makers, and the number of employees are relatively small which allows direct relation between employees and the leaders. This result might be also due to agility the generative leaders bring to the business. They can make technology decisions quickly and convince employees to utilize them.

H<sub>2</sub> (*Digital literacy of executive management has a positive effect on the digital maturity of organizations*) was supported.

This result is parallel to many studies in the literature (AlBar & Hoque, 2019; Hashim, 2015; Jeon et al., 2006). Awareness and literacy of leaders and executives will have a direct impact on the firm's digital transformation and digital maturity level. These leaders can follow technology-related advancements closely and adapt these changes to their organizations. Leaders with certain digital literacy can act as technology champions, and their employees can follow them. They can deal with resistance to change or overcome employee concerns related to digital transformation, especially in micro and small organizations.

H<sub>3</sub>: (*Digital literacy of executive management has a mediating effect on the relationship between generative leadership and the level of digital maturity of organizations*)

This finding is an interesting one and contributes to the literature. As explained in the analysis and findings section, since the significant effect of generative leadership on digital maturity disappeared when digital literacy was included in the regression analyses in the 3rd step (Table 3), it was proved that digital literacy has a mediating effect on the relationship of generative leadership to digital maturity of organizations. This means generative leaders with digital literacy contribute to firm digital maturity significantly higher.

Our analysis and findings show that generative leadership significantly supports digital maturity and that firms with generative leaders will have an advantage in successfully executing digital transformation. When the digital literacy of executives supports generative leadership, the impact on the firm's digital maturity will be significantly higher.

Finally, our analyses on sub-dimensions of digital maturity also resulted in some significant findings. According to the results, digital literacy of executive management has a full mediating effect on the relationship of generative leadership to all dimensions (technological, strategic, and cultural) of digital maturity in micro and small firms. This means a generative leader with digital literacy will contribute to the firm's digital maturity in terms of technology, strategy, and culture dimensions. This finding shows the characteristics of small firms and their role in the firm. The effect of leaders in micro and small firms is significantly higher as they are the sole or one of the few key decision-makers. They have effect on all kinds of decisions and resources as well as employees. Thus, they make the strategy and the decisions for technology purchase and utilization and impact firm culture. Thus, it is expected that they will have a significant positive impact on the technological, strategic, and cultural aspects of digital transformation.

Since digital maturity requires digitalization and beyond, it involves technology adoption and utilization, human capital management, and optimum, effective, human-centric, people-oriented management of all other resources. Primarily dealing with the social side of digital maturity, in the long run, requires change management and dealing with employee resistance. Leaders should champion the human side, and generative leadership provides this requirement.

Strategic digital maturity refers to the achievement of internal and external integration in the enterprise, as well as inter-organizational integration and wide-ranging information flow and communication in the ecosystem of the enterprise for strategic considerations (Shiels et al., 2003). In this context, customer and market data analysis and related decision-making strategies are reflected in the business as innovations. Based on this, it is expected effect that the causal relationship between the leader's generative leadership feature that encourages innovation and the strategic maturity level of the enterprise is direct. On the other hand, in enterprises that have reached a high level of technological maturity, promising technologies are used throughout the company. Different approaches are used, such as predictive analytics and real-time measurements and software based product development (İzmir Kalkınma Ajansı, 2020).

Generative leaders with high digital literacy will also be aware and interested in technologies, invest in ICT, and encourage and support digital transformation activities. This will help firms to increase their technological digital maturity. However, suppose a generative leader does not have a high-level digital literacy. In that case, they may not support ICT adoption, and digital transformation solutions, or at least they will not have this on their priority list.

To explain in more detail, digital literacy covers computer, Internet, and information literacy and especially emphasizes both technical and cognitive skills (Lau & Yuen, 2014). On the technical side, it means that the leader is knowledgeable in computers, the Internet, and current

information technologies and can use them adequately. In this context, it is evident that the digital literacy of the leaders is facilitating digital transformation and is important in catching new opportunities and integrating them into the business by following current technological innovations and disruptive technologies. Accordingly, this study's findings revealed that the leader's digital literacy level increases the strength of the causality of the relationship when the generative leadership feature causes technological maturity. Thus, it is an important finding that we validated that the digital literacy level of the leader acts as a facilitator in the relationship between generative leadership and technological maturity. If it is high, it causes higher levels of technological maturity in the firm.

The culture sub-dimension refers to the integration of digital ideas and practices into the way of doing business. It is defined as the set of opportunities an organization provides for the work environment or the development of skill sets (İzmir Kalkınma Ajansı, 2020). Making continuous investments to increase employees' digital skills, disseminating digitalization targets within the organization, encouraging employee initiatives related to digitalization, and enhancing internal communication and digital data sharing are critical aspects of cultural maturity. In this context, while technological maturity is more about realizing and implementing opportunities based on digitalization, cultural maturity emphasizes factors such as encouragement, support, and awareness. A leader who has reached the level of awareness of the benefits and needs of digital transformation, but does not have direct digital skills, can also promote a culture of digital transformation. In this case, the leader's digital literacy might be an important element that supports cultural maturity.

Our findings are supported by some previous studies as well. Based on the papers' review, Promsri (2019) identifies 64 characteristics of digital leaders who enable digital transformation and aggregates them into six main groups: digital knowledge and digital literacy, vision, customer focus, agility, risk-taking, and collaboration. So, digital literacy is considered one of the main characteristics that enable leaders to realize DT, which also supports our findings. Our finding supports this for generative leaders. Moreover, Henderikx and Stoffers (2022) indicate that managers, especially senior managers, should be capable of sensing technological trends and have the knowledge and skills to utilize such resources effectively. They need adaptive skills and digital know-how to lead digital transformations. This study's findings are parallel to our results; our study proves this for generative leaders.

As with many other studies, this study also has some limitations. The findings of the analyses are specific to a limited sample and lack generalizability. Future studies may include more respondents and firms, which is expected to contribute to the generalizability of findings and identification of more influential factors affecting the digital maturity of organizations. Moreover, this study was conducted on micro and small organizations, so findings revealed the factors flourishing digital maturity of those micro and small organizations. In large-scale organizations, factors flourishing digital maturity may be different, and analyses may produce different results. So, this survey should be repeated on large-scale firms, and findings should be compared. Finally, the generative leadership style should contribute to digital transformation efforts, and since digital transformation is vital, this subject must be investigated further and in more detail. In conclusion, our study shows that generative leadership in general and especially generative leaders with high digital literacy are among the most suitable leadership styles and leader types for high-level digital maturity or better digital transformation experience.

## Declarations

## Authors Note

This paper was presented in 5th International Conference on Research in Business, Management and Economics (ICRBME) in Paris, France

## Acknowledgements

Not applicable.

## Disclosure Statement

No potential conflict of interest was reported by the authors.

## Ethics Approval

Not applicable.

## Funding Acknowledgements

Not applicable.

## Citation to this article

Çallı, B. A., Özşahin, M., Coşkun, E., & Arık, A. R. (2022). Do Generative leadership and digital literacy of executive management help flourishing micro and small business digital maturity? *International Journal of Organizational Leadership*, 11(3), 307-332. <https://doi.org/10.33844/ijol.2022.60332>

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## References

- Abbu, H., Mugge, P., Gudergan, G., Hoeborn, G., & Kwiatkowski, A. (2022). Measuring the human dimensions of digital leadership for successful digital transformation. *Research-Technology Management*, 65(3), 39–49. <https://doi.org/10.1080/08956308.2022.2048588>
- Abedin, B., Daneshgar, F., & D'Ambra, J. (2012). Do non-task interactions matter? The relationship between non-task sociability of computer supported collaborative learning and learning outcomes. *British Journal of Educational Technology*, 43(3), 385–397.
- Abu-Bader, S., & Jones, T. V. (2021). Statistical mediation analysis using the sobel test and hayes SPSS process macro. *International Journal of Quantitative and Qualitative Research Methods*, 9(1), 42–61.
- Accenture (2017). *Accenture Technology Vision 2017*. <https://www.accenture.com/us-en/insight-disruptive-technology-trends-2017>
- Agarwal, R., & Prasad, J. (1999). Are individual differences germane to the acceptance of new information technologies? *Decision Sciences*, 30(2), 361–391. <https://doi.org/10.1111/j.1540-5915.1999.tb01614.x>
- AlBar, A. M., & Hoque, M. R. (2019). Factors affecting the adoption of information and communication technology in small and medium enterprises: a perspective from rural Saudi Arabia. *Information Technology for Development*, 25(4), 715–738. <https://doi.org/10.1080/02681102.2017.1390437>
- Alma Çallı, B., & Çallı, L. (2021). Relationships between digital maturity, organizational agility, and firm performance: An empirical investigation on SMEs. *Business & Management Studies: An International Journal (BMIJ)*, 9(2), 486–502.

- Alshamaila, Y., Papagiannidis, S., & Li, F. (2013). Cloud computing adoption by SMEs in the north east of England: A multi-perspective framework. *Journal of Enterprise Information Management*, 26(13), 250–275.
- Banger, G. (2018). *Endüstri 4.0 Uygulama ve Dönüşüm Rehberi* [Industry 4.0 Implementation and Transformation Guide] Dorlion, Ankara.
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120. <https://doi.org/10.1177/014920639101700108>
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology*, 51(6), 1173–1182.
- Bass, J. M. (2011). An Early-Stage ICT Maturity Model derived from Ethiopian education institutions. *International Journal of Education and Development Using Information and Communication Technology*, 7(1), 399–405. <http://0-ijedict.dec.uwi.edu.innopac.up.ac.za/viewissue.php?id=28>
- Bharadwaj, A. S. (2000). A Resource-based perspective on information technology capability and firm performance, an empirical investigation. *MIS Quarterly*, 24(1), 169–196.
- Bhatt, V., Sashikala, P., & Chakraborty, S. (2019). The impact of information technology and analytics on the performance of a hospital: Scale development in Indian context. *International Journal of Recent Technology and Engineering*, 8(3), 2861–2869. <https://doi.org/10.35940/ijrte.C5229.098319>
- Blatz, F., Bulander, R., & Dietel, M. (2018). Maturity Model of Digitization for SMEs. *Proceedings of 2018 IEEE International Conference on Engineering, Technology and Innovation, ICE/ITMC 2018, 2004*, 1–9.
- Bolden, R., & O'Regan, N. (2016). Digital disruption and the future of leadership: An interview with Rick Haythornthwaite, Chairman of Centrica and MasterCard. *Journal of Management Inquiry*, 25(4), 438–446.
- Bolte, S., Dehmer, J., & Niemann, J. (2018). Digital Leadership 4.0. *Acta Technica Napocensis-Series: Applied Mathematics, Mechanics, and Engineering*, 61(4), 637–646.
- Borges, M., Hoppen, N., & Luce, F. B. (2009). Information technology impact on market orientation in e-business. *Journal of Business Research Information*, 62(9), 883–890.
- Boughzala, I., & Bououd, I. (2011). A community maturity model: An application for assessing knowledge sharing in the field [Paper presentation]. *PACIS 2011 - 15th Pacific Asia Conference on Information Systems: Quality Research in Pacific*.
- Catts, R., & Lau, J. (2008). *Towards Information Literacy Indicators. Information Society Division Communication and Information Sector UNESCO (ed.). IFAP: Information for All Programme, Document code: CI.2008/WS/1*. Paris: UNESCO (United Nations Educational, Scientific and Cultural Organization). <https://www.storre.stir.ac.uk/bitstream/1893/2119/1/cattsandlau.pdf>
- Çetin, M., & Demirbilek, M. (2020). Generative leadership scale development study. *Hacettepe Egitim Dergisi*, 35(4), 887–903. <https://doi.org/10.16986/HUJE.2019052441>
- Chatzoglou, P., & Chatzoudes, D. (2016). Factors affecting e-business adoption in SMEs: an empirical research. *Journal of Enterprise Information Management*, 29(3), 327–358. <https://doi.org/10.1108/JEIM-03-2014-0033>
- Chesher, M., & Skok, W. (2000). Roadmap for successful information technology transfer for small businesses. *Proceedings of the ACM SIGCPR Conference* (pp. 16–22). <https://doi.org/10.1145/333334.333338>
- Cho, V. (2006). Factors in the adoption of third-party B2B portals in the textile industry. *Journal of Computer Information Systems*, 46(3), 18–31.
- Cichosz, M., Wallenburg, C. M., & Knemeyer, A. M. (2020). Digital transformation at logistics service providers: barriers, success factors and leading practices. *International Journal of Logistics Management*, 31(2), 209–238. <https://doi.org/10.1108/IJLM-08-2019-0229>
- Colbert, A. E., Bono, J. E., & Purvanova, R. K. (2008). Generative leadership in business organizations: Enhancing employee cooperation and well-being through high-quality relationships. *The political Psychology of Effective Human Interaction*, 23(4), 199–217.
- Dalvi-Esfahani, M., Shahbazi, H., Nilashi, M., Samad, S., Mardani, A., & Streimikiene, D. (2018). Factors influencing beliefs formation towards the adoption of social commerce in SME travel agencies. *Economics and Sociology*, 11(3), 207–225. <https://doi.org/10.14254/2071-789X.2018/11-3/13>
- Day, G. S. (2011). Closing the marketing capabilities gap. *Journal of Marketing*, 75, 183–195.
- de Winter, J. C., Dodou, D. I. M. I. T. R. A., & Wieringa, P. A. (2009). Exploratory factor analysis with small sample sizes. *Multivariate behavioral research*, 44(2), 147–181.
- Dhanaraj, C., & Beamish, P. W. (2003). A resource-based approach to the study of export performance. *Journal of Small Business Management*, 41(3), 242–261. <https://doi.org/10.1111/1540-627x.00080>

- Ekubase, G. O., & Olutayo, V. A. (2016). Study of Information and Communication Technology (ICT) maturity and value: The relationship. *Egyptian Informatics Journal*, 17(3), 239–249. <https://doi.org/10.1016/j.eij.2015.12.001>
- El Sawy, O. A. E., Amsinck, H., Kræmmergaard, P., & Vinther, A. L. (2016). How LEGO built the foundations and enterprise capabilities for digital leadership. *MIS Quarterly Executive*, 15(2), 141–166. <https://doi.org/10.4324/9780429286797-8>
- Erhan, T., Uzunbacak, H. H., & Aydin, E. (2022). From conventional to digital leadership: exploring digitalization of leadership and innovative work behavior. *Management Research Review*. <https://doi.org/10.1108/MRR-05-2021-0338>
- Eshet, Y. (2004). Digital literacy: A conceptual framework for survival skills in the digital era. *Journal of educational multimedia and hypermedia*, 13(1), 93–106.
- Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American journal of theoretical and applied statistics*, 5(1), 1–4.
- Gerth, A. B., & Peppard, J. (2016). The dynamics of CIO derailment: How CIOs come undone and how to avoid it. *Bus. Horiz*, 59, 61–70. <https://doi.org/10.1016/j.bushor.2015.09.001>
- Ghobakhloo, M., Sadegh Sabouri, M., Sai Hong, T., & Zulkifli, N. (2011). Information technology adoption in small and medium-sized enterprises; An appraisal of two decades literature. *Interdisciplinary Journal of Research in Business*, 1(7), 53–80.
- Gilli, K., Nippa, M., & Knappstein, M. (2022). Leadership competencies for digital transformation: An exploratory content analysis of job advertisements. *German Journal of Human Resource Management*, (April). <https://doi.org/10.1177/23970022221087252>
- Giropoulos, I., Kontolaimou, A., Korra, E., & Tsakanikas, A. (2017). What drives ICT adoption by SMEs? Evidence from a large-scale survey in Greece. *Journal of Business Research*, 81, 60–69. <https://doi.org/10.1016/j.jbusres.2017.08.007>
- Gray, C. (2018). What are the qualities of a digital leader? <https://www.manpowergroup.co.uk/the-word-on-work/digital-leader-qualities/>
- Gruzina, Y. ., Mel' nichuk, M. V., & Belogash, M. A. (2019). Leadership Ideas Shaped by Digital Insights in Higher Education. *Management Sciences in Russia*, 9(4). <https://doi.org/10.26764/2587-5671>
- Haffke, I., Kalgovas, B. J., & Benlian, A. (2016). The Role of the CIO and the CDO in an Organization's Digital Transformation [Paper presentation]. *Thirty Seventh International Conference on Information Systems, Dublin 2016*.
- Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review*, 9(2), 193–206.
- Hashim, J. (2015). Information communication technology (ICT) adoption among SME owners in Malaysia. *International Journal of Business and Information*, 2(2), 221–240.
- Hatta, N. N. M., Miskon, S., & Abdullah, N. S. (2017). Business intelligence system adoption model for SMEs [Paper presentation]. In *Pacific Asia Conference on Information Systems (PACIS)*. Association for Information Systems.
- Hayes, A. F. (2018). Partial, conditional, and moderated moderated mediation: Quantification, inference, and interpretation. *Communication Monographs*, 85(1), 4–40.
- Henderikx, M., & Stoffers, J. (2022). An exploratory literature study into digital transformation and leadership: toward future-proof middle managers. *Sustainability*, 14(2), 687.
- Holbert, R. L., & Stephenson, M. T. (2003). The importance of indirect effects in media effects research: Testing for mediation in structural equation modeling. *Journal of broadcasting & electronic media*, 47(4), 556–572.
- Imran, F., Shahzad, K., Butt, A., & Kantola, J. (2020, July). Leadership competencies for digital transformation: evidence from multiple cases [Paper presentation]. *International Conference on Applied Human Factors and Ergonomics* (pp. 81–87). Springer, Cham. [https://doi.org/10.1007/978-3-030-50791-6\\_11](https://doi.org/10.1007/978-3-030-50791-6_11)
- İzmir Kalkınma Ajansı. (2020). *İzmir Kalkınma Ajansı Dijital Dönüşüm Olgunluk Düzeyi Belirleme Aracı Geliştirilmesi Çalışması*. <http://izka.org.tr/wp-content/uploads/pdf/proje-sonuc-raporu.pdf>
- Jafvert, A., & Gustafsson, C. P. (2019). *Digital Transformation in Digitally Mature Organisations: Managers' perspectives on challenges in progressing in digital maturity* (Issue May) [Lund University School of Economics and Management]. <https://lup.lub.lu.se/luur/download?func=downloadFile&recordId=8988966&fileId=8988968>
- Jeon, B. N., Han, K. S., & Lee, M. J. (2006). Determining factors for the adoption of e-business: The case of SMEs in Korea. *Applied Economics*, 38(16), 1905–1916. <https://doi.org/10.1080/00036840500427262>
- Kaivo-oja, J., Roth, S., & Westerlund, L. (2016). Futures of robotics. Human work in digital transformation. *International Journal of Technology Management*, 73(4), 176–205.

- Karakose, T., Polat, H., & Papadakis, S. (2021). Examining teachers' perspectives on school principals' digital leadership roles and technology capabilities during the covid-19 pandemic. *Sustainability (Switzerland)*, 13(23). <https://doi.org/10.3390/su132313448>
- Kareem, P., Purwandari, B., Wilarslo, I., & Pratama, M. O. (2018). E-commerce Adoption in SME: A Systematic Review [Paper presentation]. *2018 6th International Conference on Cyber and IT Service Management, CITSM 2018*. IEEE.
- Khairuddin, S. M. H. S., Ahmad, N., & Omar, F. I. (2021). Developing and Validating a Digital Inclusion Instrument for Sme Entrepreneurs. *Advances in Mathematics: Scientific Journal*, 10(3), 1449–1467. <https://doi.org/10.37418/amsj.10.3.34>
- Kim, E. mee, & Yang, S. (2016). Internet literacy and digital natives' civic engagement: Internet skill literacy or Internet information literacy? *Journal of Youth Studies*, 19(4), 438–456. <https://doi.org/10.1080/13676261.2015.1083961>
- Kim, S. S., You, Y. Y., Kim, S. H., & Lee, S. K. (2015). Research direction of constructive e-business consulting for SMEs and medium-sized enterprises (SMEs): Focusing on e-commerce business. *Indian Journal of Science and Technology*, 8(S7), 306. <https://doi.org/10.17485/ijst/2015/v8is7/71290>
- Klein, M. (2020). Leadership Characteristics In The Era Of Digital Transformation, *Business & Management Studies: An International Journal*, 8(1), 883–902. <http://dx.doi.org/10.15295/bmij.v8i1.1441>
- Klimek, K. J., Ritzenheim, E., & Sullivan, K. D. (2008). *Generative leadership: shaping new futures for today's schools*. Corwin Press.
- Kozanoglu, D. C., & Abedin, B. (2020). Understanding the role of employees in digital transformation: conceptualization of digital literacy of employees as a multi-dimensional organizational affordance. *Journal of Enterprise Information Management*, 34(6), 1649–1672
- Larjovuori, R. L., Bordi, L., & Heikkilä-Tammi, K. (2018). Leadership in the digital business transformation. [Paper Presentation]. *ACM International Conference Proceeding Series* (pp. 212–221). <https://doi.org/10.1145/3275116.3275122>
- Larson, L., & DeChurch, L. A. (2020). Leading teams in the digital age: Four perspectives on technology and what they mean for leading teams. *The Leadership Quarterly*, 31(1), 101377. <https://doi.org/10.1016/j.leaqua.2019.101377>
- Lau, W. W. F., & Yuen, A. H. K. (2014). Developing and validating of a perceived ICT literacy scale for junior secondary school students: Pedagogical and educational contributions. *Computers and Education*, Elsevier {BV}, 78, 1–9.
- Liley, M., Feliciano, P., & Laurs, A. (2017). *Employee Experience Reimagined*, Accenture. <https://www.accenture.com/au-en/insight-employee-experience-reimagined>
- Lu, Y., Zhou, L., Bruton, G., & Li, W. (2010). Capabilities as a mediator linking resources and the international performance of entrepreneurial firms in an emerging economy. *Journal of International Business Studies*, 41(3), 419–436. <https://doi.org/10.1057/jibs.2009.73>
- Magesa, M. M., & Jonathan, J. (2021). Conceptualizing digital leadership characteristics for successful digital transformation: the case of Tanzania. *Information Technology for Development*, 0(0), 1–20. <https://doi.org/10.1080/02681102.2021.1991872>
- Manyika, J., Lund, S., Chui, M., Bughin, J., Woetzel, J., Batra, P., ... & Sanghvi, S. (2017). Jobs lost, jobs gained: Workforce transitions in a time of automation. *McKinsey Global Institute*, 150.
- Matt, C., Hess, T., & Benlian, A. (2015). Digital transformation strategies. *Business & information systems engineering*, 57(5), 339–343.
- McCarthy, P., Sammon, D., & Alhassan, I. (2021). Digital transformation leadership characteristics: A literature analysis. *Journal of Decision Systems*, 1-31. <https://doi.org/10.1080/12460125.2021.1908934>
- Michaelidou, N., Siamagka, N. T., & Christodoulides, G. (2011). Usage, barriers and measurement of social media marketing: An exploratory investigation of small and medium B2B brands. *Industrial Marketing Management*, 40(7), 1153–1159. <https://doi.org/10.1016/j.indmarman.2011.09.009>
- Mohd Sam, M. F., Hoshino, Y., & Hayati Tahir, M. N. (2012). The Adoption of Computerized Accounting System in Small Medium Enterprises in Melaka, Malaysia. *International Journal of Business and Management*, 7(18). <https://doi.org/10.5539/ijbm.v7n18p12>
- Mutula, S. M., & Van Brakel, P. (2007). ICT skills readiness for the emerging global digital economy among small businesses in developing countries: Case study of Botswana. *Library Hi Tech*, 25(2), 231–245. <https://doi.org/10.1108/07378830710754992>
- Nakku, V. B., Agbola, F. W., Miles, M. P., & Mahmood, A. (2020). The interrelationship between SME government support programs, entrepreneurial orientation, and performance: A developing economy perspective. *Journal of Small Business Management*, 58(1), 2–31.



- Neirotti, P., Raguseo, E., & Paolucci, E. (2018). How SMEs develop ICT-based capabilities in response to their environment: Past evidence and implications for the uptake of the new ICT paradigm. *Journal of Enterprise Information Management*, 31(1), 10–37. <https://doi.org/10.1108/JEIM-09-2016-0158>
- Ngayo Fotso, G. M. (2021). Leadership competencies for the 21st century: a review from the Western world literature. *European Journal of Training and Development*, 45(6–7), 566–587. <https://doi.org/10.1108/EJTD-04-2020-0078>
- Niemand, T., Rigtering, J. P. C., Kallmünzer, A., & Kraus, S. (2021). Digitalization in the financial industry : A contingency approach of entrepreneurial orientation and strategic vision on digitalization. *European Management Journal*, 39(3), 317–326. <https://doi.org/10.1016/j.emj.2020.04.008>
- Nolan, R. L. (1973). Managing the computer resource: A stage hypothesis. *Communications of the ACM*, 16(7).
- North, K., Aramburu, N., & Lorenzo, O. J. (2019). Promoting digitally enabled growth in SMEs: a framework proposal. *Journal of Enterprise Information Management*, 33(1), 238–262. <https://doi.org/10.1108/JEIM-04-2019-0103>
- Oliver, R., & Towers, S. (2000). Information and communications technology literacy – Getting serious about IT. In *EdMedia + Innovate Learning*. Montreal, Canada: Association for the Advancement of Computing in Education (AACE), Waynesville, NC.
- Ongardwanich, N., Kanjanawasee, S., & Tuipae, C. (2015). Development of 21st Century Skill Scales as Perceived by Students. *Procedia - Social and Behavioral Sciences*, 191, 737–741. <https://doi.org/10.1016/j.sbspro.2015.04.716>
- Pham, Q. T. (2010). Measuring the ICT maturity of SMEs. *Journal of Knowledge Management Practice*, 11(1), 1–14.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879–903.
- Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, 36(4), 717–731.
- Preacher, K. J., & Leonardelli, G. (2020). Calculation for the Sobel Test: An Interactive Calculation Tool for Mediation Tests.” Retrieved August 27, 2020 from <http://quantpsy.org/sobel/sobel.htm>
- Promsri, C. (2019). Developing model of digital leadership for a successful digital transformation. *Business Management - Gph International Journal*, 2(8), 1–8.
- Quinton, S., Canhoto, A., Molinillo, S., Pera, R., & Budhathoki, T. (2018). Conceptualising a digital orientation: antecedents of supporting SME performance in the digital economy. *Journal of Strategic Marketing*, 26(5), 427–439.
- Rogers, E. M. (1995). *Diffusion of innovations* (4th ed.). New York: Free Press.
- Rottmann, C., Reeve, D. W., Sacks, R., & Klassen, M. (2016). An Intersubjective Analysis of Engineering Leadership across Organizational Locations: Implications for Higher Education. *Canadian Journal of Higher Education*, 46(4), 146–173.
- Safari, F., Safari, N., Hasanzadeh, A., & Ghatari, A. R. (2015). Factors affecting the adoption of cloud computing in small and medium enterprises. *International Journal of Business Information Systems*, 20(1), 116–137. <https://doi.org/10.1504/IJBIS.2015.070894>
- Schiuma, G., Schettini, E., Santarsiero, F., & Carlucci, D. (2021). The transformative leadership compass: six competencies for digital transformation entrepreneurship. *International Journal of Entrepreneurial Behavior & Research*, (ahead-of-print). <https://doi.org/10.1108/IJEBR-01-2021-0087>
- Schwarz Müller, T., Brosi, P., Duman, D., & Welp, I. M. (2018). How does the digital transformation affect organizations? Key themes of change in work design and leadership. *Management Revue*, 29(2), 114–138. <https://doi.org/10.5771/0935-9915-2018-2-114>
- Scuotto, V., Magni, D., Theofilos, T., & Giudice, M. Del. (2022). Chief Digital Officer and Organizational Creativity Toward Digitalization. *IEEE Transactions on Engineering Management*, 1–12. <https://doi.org/10.1109/TEM.2022.3153395>
- Silva, C. (2017). ‘In the crisis, our productivity grew 30%’, *Estado de São Paulo*, Available; <http://economia.estadao.com.br/noticias/negocios,na-crise-nossa-productividade-cresceu-30,70001976321>
- Shiels, H., McIvor, R., & O'Reilly, D. (2003). Understanding the implications of ICT adoption: insights from SMEs. *Logistics Information Management*, 16(5), 312–326.
- Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in Structural Equation Models.” *Sociological Methodology*, 13, 290–312.
- Stine, R. (1989). An introduction to bootstrap methods. *Sociological Methods and Research*, 18(2-3), 243–291.
- Stordy, P. (2015). Taxonomy of literacies. *Journal of Documentation*, 71(3), 456–476. <https://doi.org/10.1108/JD-10-2013-0128>

- Surie, G., & Hazy, J. K. (2006). Generative leadership: Nurturing innovation in complex systems. *Emergence-Mahwah-Lawrence Erlbaum*, 8(4), 13–26.
- Tanniru, M., Khuntia, J., & Weiner, J. (2018). Hospital leadership in support of digital transformation. *Pacific Asia Journal of the Association for Information Systems*, 10(3), 1–24. <https://doi.org/10.17705/1pais.10301>
- Taylor, S. (2016). The 4 C's of Generative Leadership: What is the true meaning of leadership? <https://www.linkedin.com/pulse/4-cs-generative-leadership-susan-taylor>
- Tornatzky, L. G., & Fleischer, M. (1990). *The processes of technological innovation*. Lexington: Lexington Books.
- Triandini, E., Djunaidy, A., & Siahaan, D. (2017). A maturity model for e-commerce adoption by small and medium enterprises in Indonesia. *Journal of Electronic Commerce in Organizations*, 15(1), 44–58. <https://doi.org/10.4018/JECO.2017010103>
- Tuschner, C., Krath, J., Bings, J., Schwenkmezger, M., Eitzkorn, M., and von Korfflesch, H. (2022). Leading in the digital age: A systematic review on leader traits in the context of e-leadership. *Association for Information Systems*, 1–17. [https://aisel.aisnet.org/ecis2022\\_rp/63](https://aisel.aisnet.org/ecis2022_rp/63)
- Valdez-de-Leon, O. (2016). A digital maturity model for telecommunication service providers. *Technology Innovation Management Review*, 6(8), 19–32.
- van Laar, E., van Deursen, A. J. A. M., van Dijk, J. A. G. M., & de Haan, J. (2017). The relation between 21st-century skills and digital skills: A systematic literature review. *Computers in Human Behavior*, 72, 577–588. <https://doi.org/10.1016/j.chb.2017.03.010>
- Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Dong, J. Q., Fabian, N., & Haenlein, M. (2021). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of Business Research*, 122, 889–901.
- Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *Journal of Strategic Information Systems*, 28(2), 118–144.
- Weritz, P. (2021). Understanding IS leadership in the new normal: A systematic literature review. AMCIS 2021 Proceedings. 4. [https://aisel.aisnet.org/amcis2021/is\\_leadership/sig\\_lead/4](https://aisel.aisnet.org/amcis2021/is_leadership/sig_lead/4)
- Williams, C., Schallmo, D., Lang, K., & Boardman, L. (2019). Digital Maturity Models for Small and Medium-sized Enterprises: A Systematic Literature Review. *ISPIM Conference Proceedings*, (June) (pp. 1–15).
- Yukl, G. A. (1998). *Leadership in organizations* (4th ed.). London: Prentice-Hall International.
- Zhang, M., Sarker, S., & McCullough, J. (2008). Measuring information technology capability of export-focused small or medium sized enterprises in China: Scale development and validation. *Journal of Global Information Management*, 16(1), 25.
- Zhu, P. (2015). *Digital master: Debunk the myths of enterprise digital maturity*. Lulu Publishing Services.