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At the crossroad of digital and tourism entrepreneurship: mediating effect of digitalization in hospitality industry

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Abstract

Purpose – This study aims to explore the role of digital technologies in tourism entrepreneurship. In particular, the main objective of this research is to examine the relationships among proactiveness, innovativeness, digitalization, and firm performance and growth in the hotel industry.

Design/methodology/approach – The data for this investigation were collected from 110 one- or two-star hotels that were operating in Poland during the time of this research. This study employs PLS-SEM to analyze the relationships among the examined variables.

Findings – The results show that digitalization has a significantly positive impact on a hotel's performance. Moreover, digitalization mediates the impact of entrepreneurial behaviors on performance. In particular, digitization is a full mediator for the impact of proactiveness on firm growth and innovation on market performance. Additionally, there is a partial complementary mediation effect of digitalization in the case of impact of innovativeness on firm growth; digitization is not a mediator for the impact of proactiveness on firm growth.

Originality/value – Previous studies have not captured the relationships among entrepreneurship, digitalization, and performance; this study helps to fill the gap and examine these associations in the hospitality industry. The outcome of this study provides valuable insights for hoteliers for understanding the role (and importance) of digitalization in the context of proactiveness and innovativeness.

Keywords Hospitality industry, Digitalization, Performance, Entrepreneurial orientation, Innovativeness, Proactiveness, Risk-taking, Opportunity-seeking, PLS-SEM

Paper type Research paper

Introduction

Tourism has been an entrepreneurial activity since its beginning. The first modern tourist event is an excellent example: Thomas Cook pursued an opportunity that was sourced in new technology (namely, rail transportation) when he organized a 12-mile-long train excursion for a group of tourists in 1841 (Laws, 2020). Since then, numerous entrepreneurs have exploited different opportunities that are inherent in tourism – both in tourist needs and destination attractions. They have used entrepreneurship-specific attributes such as proactiveness,

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innovation, and risk-taking; this posture is understood under the notion of tourism entrepreneurship (Ratten, 2018). An entrepreneurial perspective is also accurate, as the tourism market is quite dynamic and provides numerous opportunities for entrepreneurs (Güzel *et al.*, 2021). Moreover, the tourism and travel industry is represented in 80% of all small and medium-sized enterprises (SMEs) (WTTC, 2021), which are believed to reflect an entrepreneurial spirit to a large extent.

Similar to other entrepreneurial activities, the entrepreneurial process within tourist enterprises depends on entrepreneurs (Koh and Hatten, 2002); their time, energy, passion, intuition, creativity, innovation, and finance help determine the success of their businesses (Güzel *et al.*, 2021). Entrepreneurial opportunity recognition is possible because of an entrepreneur's alertness (Nikraftar and Hosseini, 2016). Along with environmental facilitators such as changes in the tourism market, changes within the industry, and changes in the settings/locations, personal factors such as cognitive beliefs, intrinsic needs, and demographic factors help trigger entrepreneurial motivations (Wang *et al.*, 2019). Besides those entrepreneurs who are growth-oriented, many entrepreneurs in the hospitality and tourism sector are lifestyle-oriented (Fu *et al.*, 2019), which is a characteristic that is specific for tourism. In the last decade, a sharing economy additionally frees entrepreneurship in tourism (Avgeli, 2018). Tourism entrepreneurship can lead to higher firm performance; however, different combinations of constituting factors are required in order to obtain success in different environmental settings (Kallmuenzer *et al.*, 2019).

One of the important characteristics of tourism entrepreneurship is innovativeness (Gomezelj-Omerzel, 2016). The tourism industry welcomes many new entrepreneurial and innovative ventures and business models (Güzel *et al.*, 2021). Innovating in a business model allows one to take advantage of new opportunities and increasing his/her business's performance (Breier *et al.*, 2021). Among other things, innovativeness in the tourism and hospitality industry is associated with the implementation of digital technologies.

Currently, the global economy and society that is experiencing the Fourth Industrial Revolution, which is based on cyber-physical systems and has led to a new stage of development that is often called "Industry 4.0" (Duda and Gąsior, 2022). The implementation of new digital technologies helps enable entrepreneurs to improve the operations of their organizations (Morakanyane *et al.*, 2017; Vial, 2019) and enhances their chances of competing and surviving in the global market in the medium term (Parra-López *et al.*, 2021). Digital technologies are radically changing the processes of production, marketing, and consumption (Teece and Linden, 2017; Zhu *et al.*, 2020). A digital infrastructure offers collaboration and communication capabilities for innovative solutions to organizational problems (Elia *et al.*, 2020). Digital transformation affects a customer's experience (Morakanyane *et al.*, 2017) and all aspects of the customer's life (Reis *et al.*, 2018). Digital technologies can lead to the creation of new products and services (European Commission, 2018). Consequently, the business of numerous companies largely depends on their digital capabilities (Datta and Nwankpa, 2021). Therefore, the governments of many countries support digital innovation in order to help create and develop new ecosystems (Bai *et al.*, 2021; Borowiecki *et al.*, 2021).

Digital technologies create a new space for opportunities and entrepreneurial actions and can affect an opportunity (Nambisan, 2017). Along with the use of digital solutions for pursuing opportunities, the quest for such digital opportunities constitutes digital entrepreneurship. This is associated with digital technology such as new media and the internet (Davidson and Vaast, 2010), but it is also tied to other advancements such as AI (Chatterjee *et al.*, 2021). Entrepreneurs can use digital platforms for developing new products and services (Kraus *et al.*, 2019). Digital entrepreneurship results in the transformation of traditional entrepreneurial venture formats into digital ones (Hair *et al.*, 2012) as well as the emergence of digital business models (Hull *et al.*, 2007). Due to the dynamic development of technology, digital entrepreneurs need to maintain a high degree of innovativeness

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(Kraus *et al.*, 2019). Recent studies have shown that digital entrepreneurship enhances business competitiveness, performance, and productivity (Sion, 2019; Zahra, 2021).

Digital technologies have been implemented in tourism as well; these include online travel agencies, accommodation, transport, and destination activities (Buhalis *et al.*, 2019). In the hospitality industry, a wide range of solutions that impact a guest's sensory experiences and behavior are being utilized (Pelet *et al.*, 2021) through features such as smart environments in guest rooms (Sheivachman, 2018). These solutions include sensors, telecoms networks, the IoT, and AI (Salguero and Espinilla, 2018; Ivanov and Webster, 2019). Big data, machine learning, and natural language processing are also being used to support marketing operations (i.e. segmentation and customization) (Filieri *et al.*, 2021). However, the use of these solutions raises new challenges in the area of privacy and data protection (Yallop *et al.*, 2021). Digitalization can enhance the recovery of the tourism industry after the COVID-19 pandemic (which seriously affected the industry) (Škare *et al.*, 2021; Pärl *et al.*, 2022); in particular, SMEs have been affected the most (European Commission, 2020).

Despite the numerous studies on digitalization, our understanding of the impact of digitalization on performance is limited and needs further progress (Nambisan, 2017; Kohli and Melville, 2019; Liu *et al.*, 2022), particularly in the entrepreneurial context (Kapron and Meertens, 2017; Luo *et al.*, 2021) as well as regarding tourism entrepreneurship (Ratten, 2020). To our knowledge, the role of digitalization in the entrepreneurial activity of hotels has not been examined.

This study addresses this research gap and aims to explore the role of digital technologies in tourism entrepreneurship. In particular, this study aims to examine those relationships that firm entrepreneurial behavior and digitalization have with firm market performance and growth in the hospitality industry. In this study, entrepreneurial behavior is represented by proactiveness and innovativeness. To achieve its objectives, this study employed the PLS-SEM methodology to examine the relationships among the variables. The sample consisted of 110 one- and two-star hotels that were operating in Poland during the time of our study.

This study strives to contribute to the literature on entrepreneurship, digitalization, and tourism management. The study joins the research that is focused on relationship between organizational entrepreneurship and firm performance. Due to the increasing role of digitalization in business, the intended explanation of its positions regarding entrepreneurial behaviors and a firm's growth and performance can be substantial for the development of the theory. In particular, the study aspires to identify the mediating effects of digitalization in reinforcing an impact of entrepreneurial behaviors (proactiveness and innovativeness) on hotel performance and growth. Moreover, this study intends to support hoteliers during the process of digitalizing their hotels.

The remainder of the article is as follows. First, literature regarding variables is reviewed, and research hypotheses and models are proposed. Second, the research procedure and method are described. Third, the results of the examination are presented and discussed. Finally, the study's limitations are indicated, and potential directions for future research are proposed.

Theoretical background

Entrepreneurial performance in tourism

Firm performance is a multidimensional construct. Business performance can refer to financial outcomes (e.g. profit, return on capital), market results (e.g. market share, brand recognition), or firm growth (e.g. increases in numbers of employees or products offered). To measure a hotel's operational performance, variables such as room occupancy, average daily rate (ADR) and revenue per available room (RevPAR) are considered (Pereira-Moliner *et al.*, 2021).

Many factors influence the performance of a hotel; e.g. its location (Xiao *et al.*, 2012), human resource management (HRM), quality management (QM), sustainability, corporate social responsibility, strategy (Sainaghi *et al.*, 2019; Pereira-Moliner *et al.*, 2021), ownership

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structure (Chen and Yeh, 2012), brand, and diversification (Yang *et al.*, 2017; Woo *et al.*, 2019; Kim and Lin, 2021).

The performance of tourism firms can be positively affected by entrepreneurial behavior (Alrawadieh *et al.*, 2021). Fu *et al.* (2019) found that sales growth, market share, and profitability were among the most-often-observed outputs of entrepreneurial activity in hospitality and tourism studies. Kallmuenzer *et al.* (2019) identified several combinations of entrepreneurial behaviors that can lead to increased firm performance. There is evidence that entrepreneurial orientation (whose dimensions are proactiveness, innovativeness, and risk taking) positively impacts the success of a new product (Kam-Sing Wong, 2014) and the performance of a tourism firm (Palacios-Marqués *et al.*, 2017; Peters and Kallmuenzer, 2018; Tajeddini *et al.*, 2020). However, entrepreneurial orientation can also play the role of moderator (Urban and Maphumulo, 2021).

Proactiveness

Proactiveness (PR) is one of the manifestations of entrepreneurship (Covin and Slevin, 1989). Miller (1983, p. 771) defined a proactive firm as a firm that "is first to come up with 'proactive' innovations." Proactiveness is aimed at introducing new products or services before one's competitors do (Rauch *et al.*, 2009; Venkatraman, 1989); thus, a firm needs to incorporate a forward-looking course of action (Covin *et al.*, 2016). Consequently, proactive firms are often perceived as leaders by those competitors who follow their examples (Covin *et al.*, 2016).

One of the development trends is digitalization. As proactiveness is about a forward-looking perspective and the anticipation of future opportunities and demand (Venkatraman, 1989; Rauch *et al.*, 2009), we can expect that proactive firms will use digitalization to introduce new products or services before their competitors do. Recent studies have highlighted the role of EO (of which proactiveness is a dimension) in capturing digital opportunities and finding digital solutions (Penco *et al.*, 2022). Proactiveness has an impact on a firm's performance; in particular, marketing proactivity (Narver *et al.*, 2004; Jaeger *et al.*, 2016) and proactive market orientation (Gotteland *et al.*, 2020) affect a company's market performance. This can also be observed in SMEs (Lomberg *et al.*, 2017) and tourism firms (Fadda, 2018) – including hotels (Njoroge *et al.*, 2020). Based on the above observations, we posit the following hypotheses:

$H1_{pr}$. Proactiveness positively impacts market performance;

$H2_{pr}$. Proactiveness positively impacts firm growth;

$H3_{pr}$. Proactiveness positively impacts firm digitalization.

Innovativeness

Entrepreneurship is also exhibited with innovativeness (IN). Innovativeness enables a firm to pursue new opportunities (Lumpkin and Dess, 1996). According to Schumpeter (1911), entrepreneurs recognize promising inventions and introduce such inventions to market. Innovativeness is one of the three main dimensions of EO (Covin and Slevin, 1989). This is visible in the hospitality industry as well; according to the study of Hernández-Perlines *et al.* (2019), innovativeness is the most important dimension of entrepreneurial orientation in Spanish hotels. Despite the fact that tourism often used to be perceived as less innovative than manufacturing industries (Gomezelj-Omerzel, 2016), many innovative solutions have been absorbed and developed in the tourism industry over the past decades (Wang *et al.*, 2016). These innovations have mostly been incremental (Grissemann *et al.*, 2013); however, disruptive innovation has also occurred, resulting in changes to market structures (Viglia *et al.*, 2018). One such example is a platform that connects hosts and guests that was introduced by Airbnb (Guttentag and Smith, 2017). Due to the extreme importance of the human component in providing tourist services (which are simultaneously produced and consumed) (Gomezelj-Omerzel, 2016), employee innovative work behavior needs to be enhanced (Chang *et al.*, 2011; Farrukh *et al.*, 2022).

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The study of innovative service firms shows that their main characteristics include the existence and efficient use of intangible assets, leader experience (or employee qualification), and an organizational culture toward innovation (Peixoto *et al.*, 2022). Other factors that impact a firm's ability to manage innovation are its management style, leadership, resources, corporate strategy, technology, and knowledge management (Smith *et al.*, 2008). Innovation in hotels can also be influenced by their size (Jacob and Groizard, 2007), location (Vila *et al.*, 2012), and categorization (Orfila-Sintes *et al.*, 2005). Among those external factors that positively impact innovation development are market demand and competition (Anning-Dorson, 2017). The tourism industry is dominated by small firms; these firms often lack sufficient resources, so open innovation can be an option (or even a requirement) for their development (Lichtenthaler, 2011).

Innovations have the potential to positively impact a firm's performance (Camarero and Garrido, 2008; Kallmuenzer and Peters, 2018) and its growth (Petrou and Daskalopoulou, 2009).

In the tourism industry, innovativeness is considered to be a key factor for a firm's competitive advantage (Dang and Wang, 2022) and success (Paget *et al.*, 2010). Additionally, innovation activities can improve quality standards (Melhem *et al.*, 2018). Innovativeness can also influence the digitalization of a firm (Agostini *et al.*, 2020; Penco *et al.*, 2022); however, Gomezelj-Omerzel's 2016 review of research regarding innovation in hospitality and tourism showed that there are many areas in which innovation is still needed. Based on the above considerations, we posit the following hypotheses:

$H1_{in}$. Innovativeness positively impacts market performance;

$H2_{in}$. Innovativeness positively impacts firm growth;

$H3_{in}$. Innovativeness positively impacts firm digitalization.

Digitalization

As stated earlier, digitalization (DIG) augments those areas where opportunities can appear or be created. Moreover, opportunities can be affected by digital artifacts, digital platforms, and digital infrastructures (Nambisan, 2017). These opportunities can trigger entrepreneurial actions that can lead to increases in performance. In particular, IT technology offers the opportunity to create new products, new channels of communication with customers, or even new means of payments; this refers to the tourism sector as well. Besides reservation systems and tourist social media, advanced digital technologies such as machine-learning algorithms (Zhang *et al.*, 2017), blockchain technology (Valeri and Baggio, 2021) as well as AI-based robotics, AR/VR, and chatbots (virtual assistants) are being used in the hospitality industry (Doborjeh *et al.*, 2022).

Numerous studies have indicated that the implementation of digital technologies positively affects a company's operation and performance (Teece, 2018; Chatterjee *et al.*, 2020; Liu *et al.*, 2022). Digital innovations can lead to the increased satisfaction of customers (Gale and Aarons, 2018) and employees (Bueechl *et al.*, 2021) as well as increased customer loyalty (Balci, 2021). Additionally, digitalization enables individuals and enterprises to co-create and share value (Nambisan, 2017) and enhance their process-innovation capabilities (Tajudeen *et al.*, 2022). Digital innovations (triggered by the digitalization process) can be an important source of a company's competitive advantage (Volkoff and Strong, 2013; Chatterjee *et al.*, 2020). Digital transformation plays an important role in organizational development (Svahn *et al.*, 2017; Sestino *et al.*, 2020), leading to changes in company business models (Rodríguez-Anton and Alonso-Almeida, 2020; Bueechl *et al.*, 2021). However, some studies have reported that the adoption of digital innovations can lead to different results in manufacturing companies (e.g. Hanelt *et al.*, 2021).

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Digital solutions play an important role in the tourism sector as well. In particular, digitalization enhances a firm's innovation capabilities (Sigala, 2012) and operational efficiency (Hashim and Murphy, 2007), and they enable the development of new services (Gomezelj-Omerzel, 2016). These solutions can help lead to the economic growth of hotels (Martin-Rojas *et al.*, 2014).

Thus, we propose the following research hypotheses:

$H1_{dig}$. Digitalization positively impacts market performance;

$H2_{dig}$. Digitalization positively impacts firm growth.

Previous studies have suggested that the relationship between a hotel's characteristics and performance can be affected by other factors. For example, the relationship between quality management and a hotel's performance is fully mediated by its differentiation competitive advantage (Pereira-Moliner *et al.*, 2021), the relationship between brand diversification and a hotel's performance is moderated by its ownership structure and location (Kim and Lin, 2021), and the impact of internationalization on a hotel's performance is moderated by agglomeration-related factors (namely, differentiation within the cluster, and the location of the cluster) (Woo *et al.*, 2019). The effect of product diversification on a hotel's performance is moderated by its location, diversification expansion rate, and foreign ownership/operation (Yang *et al.*, 2017).

In the digitalization context, Zhao and Kong (2022) observed that the relationship between a firm's openness in specialized searches and ambidextrous digital-process innovation can be mediated through an absorptive capacity and moderated by organizational innovativeness.

The impact of entrepreneurship on performance can also be moderated or mediated by other factors (e.g. Adam *et al.*, 2022; Liu and Wang, 2022Khan *et al.* (2021) found that entrepreneurial orientation positively moderates the association between organizational learning capabilities and business-model innovation in SMEs, while Chaudhary (2019) and Sen *et al.* (2022) found that entrepreneurial orientation can mediate the relationship between strategic flexibility and firm performance). The studies focused on moderating and mediating effects related to organizational entrepreneurship–performance relationships develops in past years (see examples in). Moreover, entrepreneurship can play the role of moderator or mediator toward other factors that affect performance (e.g. Khan *et al.* (2021) found that entrepreneurial orientation positively moderates the association between organizational learning capabilities and business-model innovation in SMEs, while Chaudhary (2019) and Sen *et al.* (2022) found that entrepreneurial orientation can mediate the relationship between strategic flexibility and firm performance). The studies focused on moderating and mediating effects related to organizational entrepreneurship–performance relationships develops in past years (see examples in Wales *et al.*, 2021). In turn, digitalization can play the role of mediator in the innovation–performance relationship (Tsou and Chen, 2021) or product innovation and servitization (Vilkas *et al.*, 2022). However, service innovation can mediate the connection between intellectual capital components and the competitive advantage, while big data analytics capabilities can moderate this relationship (Alkhatib and Valeri, 2022). Mediation refers to ". . . existence of a significant intervening mechanism between antecedent and the consequent variables" (Venkatraman, 1989, p. 428), and a mediator enables us to specify how (or the mechanism by which) a given effect occurs. Thus, we hypothesize that digitalization can mediate the impact of entrepreneurship on performance based on our previous hypotheses that a) proactiveness, innovativeness, and digitalization can affect a firm's performance and growth and b) proactiveness and innovativeness can affect digitalization. In particular, we propose the following hypotheses:

$H4_{pr}$. Digitalization mediates the relationship between proactiveness and market performance;

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$H5_{pr}$. Digitalization mediates the relationship between proactiveness and firm growth;

$H4_{in}$. Digitalization mediates the relationship between innovativeness and market performance;

$H5_{in}$. Digitalization mediates the relationship between innovativeness and firm growth.

Our hypotheses regarding the associations among proactiveness, innovativeness, digitalization, market performance, and firm growth (including mediating the role of digitalization) are presented in the research model that is depicted in Figure 1.

Methodology

Sample

This study's sample consisted of one- and two-star hotels that were operating in Poland during our research. According to the Central List of Hotel Facilities (Ministry of Sport and Tourism of the Republic of Poland, 2021), there were 680 entities as of November 10, 2021. One-hundred-and-seventeen hotels were randomly selected for the sample. The data were collected during the period of November–December 2021 by a specialized pooling company. To gather the data, an entrepreneur's self-assessment questionnaire (which is a commonly used tool in small tourist firm surveys (Fu *et al.*, 2019)) was employed. One-hundred-and-ten fully completed questionnaires were received; these represented 14.85% of the target population. Based on formula proposed by Sudman and Bradburn (1982), we estimated a sample error – it is 9.04% (with an assumed 95% confidence level), which is an acceptable value. The characteristics of the sample are presented in Table 1.

Variables

In this study, we examined the relationships among five variables: proactiveness (PR), innovativeness (IN), digitalization (DIG), market performance (MP), and firm growth (FG). All of the variables were indices; each was comprised of several items, and each item was measured with a seven-degree Likert scale. Those coefficients that represented performance,

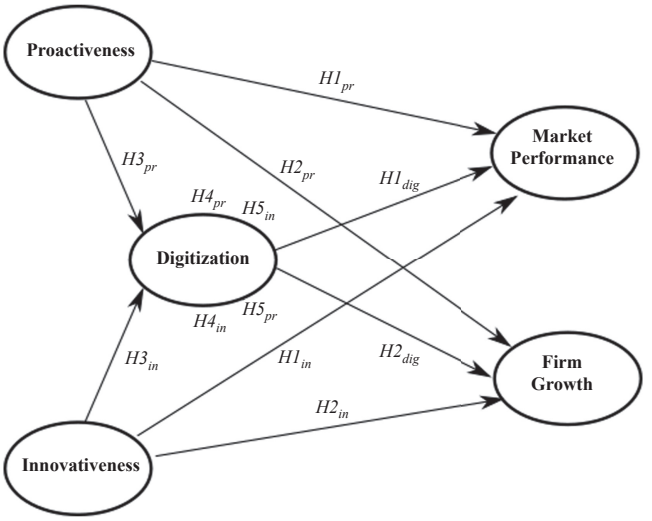

Figure 1.
Research model

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Characteristic	Range	Percentage
Age	0–5	7.0%
	6–10	18.8%
	11–20	31.6%
	21–30	30.7%
	above 30	11.9%
Type of enterprise	Micro	51.5%
	Small	44.6%
	Medium	3.9%
Family enterprise	Yes	50.0%
	No	50.0%
Standard category	One-star	27.3%
	Two-star	72.7%
Number of beds	20–50	63.6%
	51–100	22.7%
	more than 100	13.7%
Managing more than one hotel	Yes	23.6%
	No	76.4%
Member of hotel chain	Yes	16.4%
	No	83.6%

Table 1. Characteristics of sample

proactiveness, and innovativeness were based on previous entrepreneurial orientation scales (Hughes and Morgan, 2007; Kusa *et al.*, 2021); however, they were adapted to the hotel industry. The coefficient of firm growth was adapted from previous studies (Kusa *et al.*, 2022). Finally, the digitalization index was a newly proposed index. Regarding our constructs, common method bias has been controlled through a full collinearity assessment approach. In particular, we employed VIF values for the variables; in each case, this value was lower than 3.3. This indicates that the model is free from common method bias (Kock, 2015). The characteristics of each index (including their reliability) are presented in Table 2.

Method and procedure

Due to the explorative nature of the study and the non-normal data distribution of the Likert scale-based measures, the partial least squares (PLS) technique was applied to structural equation models (SEMs) based on variance. PLS-SEM is a "regression-based" approach that minimizes the residual variances of the endogenous constructs (Hair *et al.*, 2022). This technique works well with the mediation analysis that is presented in this paper (Nitzl *et al.*, 2016; Cepeda-Carrión *et al.*, 2017). SmartPLS software (V.3.3.5) was used to build the models and assess their validity (Ringle *et al.*, 2015).

The analysis was conducted in three steps. First, the reliability of the items was analyzed by evaluating the loads (λ), which explain the variances between each construct and its indicator (Palos-Sanchez and Saura, 2018). Second, the hypotheses were tested through the structural models. Finally, the type and strength of the mediating effect of the digitalization were estimated.

Results

Measurement model evaluation

The measurement model evaluates whether the considered constructs are correctly measured through the indicators (Klarner *et al.*, 2013); therefore, the model must be assessed for its reliability and validity. The results for the measurement model are presented in Figure 2 and Tables 2 and 3.

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Constructs	Indicators	Item	Mean	Std. dev	VIF	Construct reliability and validity			
						α	rho_A	CR	AVE
Proactivity (PR)	We excel at identifying opportunities and market needs	PR1	4.34	1.83	2.11	0.84	0.85	0.89	0.68
	We initiate actions to which other organizations respond	PR2	4.54	1.65	1.79				
	We search for new opportunities more intensively than our competitors do	PR3	3.75	1.53	2.20				
	We always try to take the initiative in each situation	PR4	3.75	1.37	2.27				
Innovation (IN)	Our organization seeks out new ways to do things	IN1	4.73	1.37	1.33	0.74	0.77	0.83	0.56
	We actively introduce improvements and innovations in our organization	IN2	3.69	1.63	1.74				
	Innovation is the source of our success	IN3	4.13	1.49	2.02				
	Relative to competing products, those of our business are more innovative	IN4	4.42	1.72	1.35				
Digitalization (DIG)	We use many digital solutions in our activities	DIG1	2.55	1.53	1.70	0.89	0.89	0.92	0.69
	We are more digitalized than our competitors are	DIG2	2.82	1.48	2.68				
	Our results are improving due to digitalization	DIG3	3.14	1.53	4.52				
	Digitalization has enabled us to significantly improve our operation	DIG4	3.45	1.72	4.20				
	We are advanced in terms of the digitalization process	DIG5	2.98	1.62	1.92				
Market performance (MP)	Relative to competing products, our products are more successful in terms of sales	MP1	3.97	1.50	2.20	0.84	0.86	0.89	0.68
	Relative to competing products, those of our business achieve and maintain a higher market share	MP2	3.01	1.44	2.48				
	Relative to our competitors, our income is greater	MP3	2.87	1.40	2.75				
	Relative to our competitors, our profit is greater	MP4	3.23	1.23	2.44				

(*continued*)

Table 2. Measurement model evaluation results

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Constructs	Indicators	Item	Mean	Std. dev	VIF	Construct reliability and validity α	rho_A	CR	AVE
Firm growth (FG)	Our market recognizability has increased this year	FG1	3.94	1.15	1.58	0.86	0.87	0.9	0.7
	Our income has increased	FG2	3.75	1.19	4.79				
	Our profitability has increased	FG3	3.40	1.12	4.84				
	Our business has grown faster than those of our competitors	FG4	3.39	1.09	1.63				

Note(s): α = Cronbach's alpha; CR = composite reliability; AVE = average variance extracted; rho_A = reliability coefficient; VIF = variance inflation factor

Table 2.

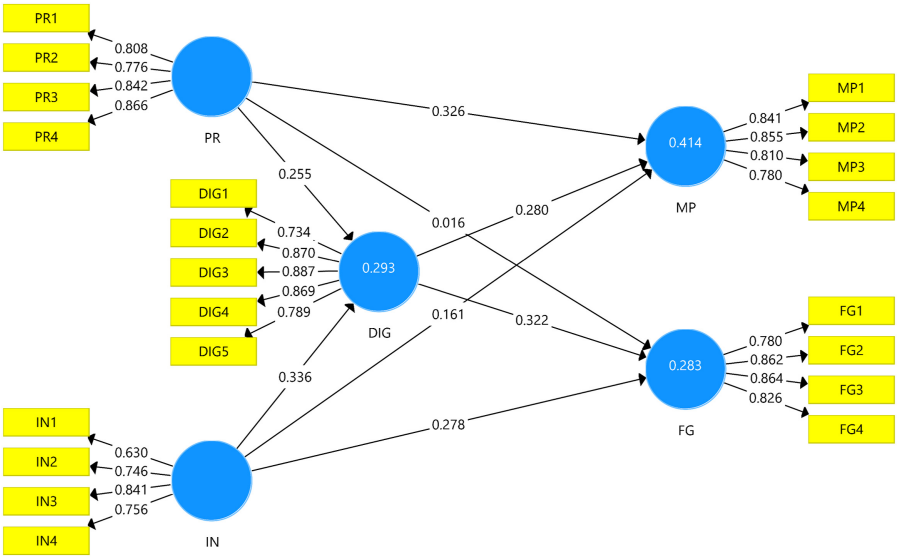

Figure 2.
Measurement structural model

Construct	Fornell–Larcker discriminant validity criteria 1	2	3	4	5	HTMT discriminant validity criteria 1	2	3	4	5
PR	*0.824*									
IN	0.672	*0.747*				0.847				
DIG	0.481	0.507	*0.832*			0.550	0.588			
MP	0.568	0.522	0.518	*0.822*		0.657	0.612	0.592		
FG	0.358	0.452	0.471	0.621	*0.834*	0.401	0.527	0.525	0.699	

Table 3.
Fornell–Larcker and HTMT discriminant validity criteria

Figure 2 shows the indicator outer loading for each construct. A value that is above 0.5 is acceptable for an indicator; however, 0.7 is required for more-stringent assumptions. Only one indicator outer loading for the innovation construct was slightly lower than the 0.7 threshold.

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The indicators for all of the remaining constructs were greater than 0.7. According to Hair *et al.* (2022), values that are between 0.60 and 0.70 are considered to be acceptable in exploratory research, while values between 0.70 and 0.90 can be considered satisfactory in more-advanced phases of research. The values for internal consistency reliability and convergent validity are presented in Table 2. The acceptance of the reliability of the construct was established with a minimum Cronbach's alpha of 0.6–0.7 (Fornell and Larcker, 1981). Table 2 shows the calculation of this coefficient for the constructs of the proposed model. As shown, all of the latent variables presented values that confirmed their high internal consistency. Regarding redundancy, the values did not exceed 0.95 (Diamantopoulos *et al.*, 2012); therefore, no problems were evident. The rho_A statistic provides a reliability value. As proposed by Dijkstra and Henseler (2015), rho_A should be greater than 0.7 and should lie between the values of composite reliability and Cronbach's alpha; this condition holds for our data (see Table 2). To assess convergent validity, the average variance extracted (AVE) was analyzed, which provides information on how much variance a construct shows. Hair *et al.* (2017) stated that an AVE of 0.50 or greater can be interpreted as more than 50% of the variance of the construct being due to its indicators. The results observed in Table 2 support the convergent validity of the reflective constructs. As can be seen, all of the values exceeded 0.50 (ranging between 0.50 and 0.70); therefore, the constructs met this condition.

Table 2 also includes the values of the variance inflation factor (VIF) for each item. According to Diamantopoulos and Winklhofer (2001), values below the cut-off level of 5 assure the absence of the undesirable property of multicollinearity.

To evaluate the discriminant validity, the square root of the AVE of each variable was analyzed; according to Fornell and Lacker (1981), this criterion must be greater than the correlation that each variable has with any other in the model. Henseler *et al.* (2015) pointed out that the lack of discriminant validity is better-detected with the Heterotrait-Monotrait (HTMT) relationship (whose values must be below 0.90). The results of the discriminant validity met both criteria (as is shown in Table 3).

Along with the results that are presented in Tables 2 and 3 and Figure 2, the above analysis proves that the construct that was proposed in the model was correctly constructed (as was the model itself). As the one of the approximate model fit criteria, the standardized root mean square residual (SRMR) was additionally calculated to estimate the level of the model fit (following the guidelines of Henseler *et al.* (2015)). A value of less than 0.10 is considered to be a good fit (or lower than 0.08 in a more conservative version; see Hu and Bentler, 1999). In our model, the SRMR equaled 0.84; this means that an acceptable level of fit was achieved.

The results that are included in the measurement model (presented in Figure 2) enabled us to determine the impact strengths of the individual exogenous variables on the endogenous variables and to what extent they explained their variability. In particular, IN had a stronger effect on DIG (0.332) than it did on PR (0.255). Moreover, these two constructs explained 29.3% of the variance of the DIG construct ($R^2 = 0.293$) (as indicated by the value in the circle). In turn, PR had the strongest effect on MP (0.326), followed by DIG (0.280) and IN (0.161). In all, 41.4% of the variance of the MP construct was explained by three constructs: PR, DIG, and IN. The DIG variable had the strongest impact on the endogenous FG variable. The value of this path coefficient equaled 0.322; for a comparison, this was equal to 0.278 in the case of IN and only 0.016 for PR. Together, DIG, IN, and PR explained 28.3% of the variance of FG ($R^2 = 0.283$). The obtained values of the coefficients gave us the opportunity to determine the strengths of the relationships of the subject as well as the preliminary verifications of the hypotheses put forth. We can conclude (Hair *et al.*, 2022) that PR did not affect FG and that IN did not affect MP because the sizes of the path coefficients were less than 2. Nevertheless, making definite statements about a path coefficient's significance requires us to determine the coefficient estimates' standard error.

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Assessment of structural model

Applying the bootstrapping procedure with 5,000 iterations enabled us to verify the statistical significance of the path coefficients marked in Figure 2; in this way, it was possible to verify the research hypotheses. In the model with a mediator, we tested the statistical significance of the path coefficients for both the direct and indirect effects. The results of this analysis are presented in Table 4.

Based on the results that are shown in Table 4, we can conclude that six of the eight-tested direct effects were significant (with *t*-statistic >1.96 and *p*-value <0.05). A statistical significance was not obtained for only two paths: PR → FG, and IN → MP (the *p*-values were greater than 0.05). Following Ramayah *et al.* (2018), we also calculated the corrected confidence interval errors (which are presented in Table 4). If this range does not contain 0, this is a confirmation of the significance of the determined coefficient. In the case of PR's effect on FG and IN's effect on MP, the ranges contained 0; the remaining dependencies did not. This conclusion confirms the assumptions that were formulated during the analysis of the measurement model. Thus, the results confirmed six out of the eight hypotheses regarding direct effects; i.e. $H1_{pr}$, $H3_{pr}$, $H2_{in}$, $H3_{in}$, $H1_{dig}$, and $H2_{dig}$. Hypotheses $H2_{pr}$ and $H1_{in}$ were not confirmed; therefore, the analysis of the direct relationships showed that proactiveness does not significantly directly affect a company's growth, while innovation does not have a significant impact on the market performance of hotels.

Type of effect	Hypothesis	Path	Original sample	Sample mean	Bootstrapping *T*-statistics	Bootstrapping *p*-values	Confidence interval (bias-corrected)
direct	$H1_{pr}$	PR → MP	0.326**	0.333	2.602	0.009	(0.061, 0.559)
	$H2_{pr}$	PR → FG	0.016	0.022	0.123	0.902	(−0.227, 0.277)
	$H3_{pr}$	PR → DIG	0.255*	0.251	2.483	0.013	(0.056, 0.442)
	$H1_{in}$	IN → MP	0.161	0.161	1.553	0.121	(−0.044, 0.37)
	$H2_{in}$	IN → FG	0.278*	0.28	2.153	0.031	(0.001, 0.498)
	$H3_{in}$	IN → DIG	0.336***	0.349	3.925	0.000	(0.159, 0.487)
	$H1_{dig}$	DIG → MP	0.28**	0.275	2.736	0.006	(0.073, 0.468)
	$H2_{dig}$	DIG → FG	0.322**	0.324	3.329	0.001	(0.111, 0.509)
indirect	$H4_{pr}$	PR → DIG → MP	0.072	0.071	0.043	0.094	(0.011, 0.181)
	$H5_{pr}$	PR → DIG → FG	0.082*	0.08	0.041	0.044	(0.023, 0.198)
	$H4_{in}$	IN → DIG → MP	0.094*	0.097	0.045	0.037	(0.019, 0.192)
	$H5_{in}$	IN → DIG → FG	0.108*	0.115	0.049	0.026	(0.031, 0.215)

Note(s): *** *p*-value <0.001; ** *p*-value < 0.01; * *p*-value < 0.05

Table 4.
Structural model statistics (direct and indirect effects)

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In turn, the bootstrapping analysis showed that three of the four indirect effects (assumed in a theoretic model [see Figure 1]) were significant (with the assumed levels of significance). The mediation effect of digitization for the impact of IN on both MP and FG was significant (in both cases, the p-value was less than 0.05). On the other hand, the impact of the PR that was mediated by DIG was only significant for the endogenous FG variable and was not significant for MP. However, the latter conclusion was not confirmed in the 95% confidence interval bias-corrected analysis for the indirect effect of PR → DIG → MP, as the range did not contain 0 (0.011,0.181). Therefore, we can conclude that the effects of three out of the four hypotheses about the mediation of digitization (i.e. $H5_{pr}$, $H4_{in}$, and $H5_{in}$) have been confirmed. On the other hand, Hypothesis $H4_{pr}$ was preliminary not confirmed due to the ambiguity of the results (an additional analysis in the forthcoming chapter is meant to confirm the correctness of such a decision).

Table 5 shows additional criteria for evaluating the structural model in PLS (Hair *et al.*, 2022), which are the coefficient of determination (R^2), the adjust coefficient of determination (R^2_{adj}), and the cross-validated redundancy (Q^2) (Geisser, 1974). In addition, the statistical significance of the R^2 and R^2_{adj} coefficients was verified. The obtained results indicated that the model had a significant predictive significance; namely, the values of the coefficients of determination for all of the endogenous dimensions were greater than 0.1 and were statistically significant (Falk and Miller, 1992), and the Stone-Geisser Q^2 statistics were greater than 0 (Geisser, 1974).

Analysis of mediation effect

Based on the values of the path coefficients (both for the direct and indirect effects) as well as the verification of their significance, it is possible to test the hypotheses about the mediation nature of the DIG construct (see Nitzl *et al.*, 2016; Hair *et al.*, 2022). If mediation is confirmed, it is additionally possible to test whether we are dealing with full or partial mediation (complementary or competitive) (MacKinnon *et al.*, 2007). It is also possible to compare the strength of the mediation for the individual paths.

As suggested by Zhao *et al.* (2010) and Nitzl *et al.* (2016), a mediation effect occurs if a path coefficient for an indirect effect is significant. In addition, we are dealing with full mediation if the path coefficient for the direct effect is not significant; otherwise, we have partial mediation. In partial mediation, a division into complementary partial mediation and competitive partial mediation is taken into account. The former refers to a situation in which the path coefficient signs (for the indirect and direct effects) are the same, while the latter indicates that the mediation is interpreted as being competitive.

Some researchers use Variance Accounted For (VAF) (Hair *et al.*, 2017) to verify the mediation effect and its strength. For a simple mediation, the proportion of the mediation is defined as follows:

$$VAF = \frac{a \times b}{a \times b + c'} \cdot 100\%,$$

where $a \times b$ reflects the indirect effect, and c' represents the direct effect.

Endogenous constructs	R^2	R^2_{adj}	Q^2
DIG	0.293***	0.280***	0.196
MP	0.414***	0.398***	0.252
FG	0.283***	0.263**	0.166

Note(s): *** p-value <0.001; ** p-value < 0.01; * p-value < 0.05

Table 5. Endogenous construct assessment

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The VAF varies between 0 and 100% for models where $a \times b$ and c' have the same sign. Helm *et al.* (2010) proposed that VAF values above 80% indicate full mediation, those between 20 and 80% indicate partial mediation, and those below 20% indicate no mediation effect. Ramayah *et al.* (2018) suggested that the VAF concept may provide some deeper insights into mediation analysis but that it should be interpreted very cautiously without mixing the use of full, partial, and no mediation. Moreover, some researchers (e.g. Hair *et al.*, 2017) have advised the calculation of VAF only when the absolute value of standardized total effect $c = a \times b + c'$ is at least 0.20. VAF also works well if a researcher would like to compare the strengths of multiple mediators in a model on each indirect relationship. In our analysis of the mediator effects, we based it on a previously conducted analysis of direct and indirect effects as well as on the designated VAF values (which are summarized in Table 6).

According to the results of our analysis that are presented in Table 6, it can be concluded that digitization is not a mediator for the impact of proactiveness on market performance. First, the indirect effect is not significant, and second – the VAF = 18.1% (i.e. it is less than 20%).

Based on the analysis of the direct and indirect effects, we conclude that the effect of the full mediation occurs in the case of proactivity on firm growth and innovation on market performance. For both paths, the indirect effect is significant and the direct effect is not. While the conclusion for proactivity was confirmed by the VAF value (which was greater than 80% for the PR → FG path), the VAF was relatively low in the case of the IN → MP path (36.9%); this would indicate partial mediation. Taking the previous considerations into account, we nevertheless conclude that digitization is a full mediator for the impact of innovation on a firm's market performance.

Finally, we come to the conclusion that there was a complementary partial mediation effect after analyzing the coefficients for the IN → FG path, as both the direct and indirect effects were statistically significant and had the same sign. Moreover, the VAF = 28% value indicates this type of mediation.

Based on the characteristics of each mediation path (presented in Table 6), we can verify our hypotheses regarding mediating effects of digitalization. In particular, $H4_{pr}$ has not been confirmed, $H5_{pr}$ and $H4_{in}$ have been confirmed, and $H5_{in}$ has been partially confirmed (due to the observed complementary mediation).

Discussion

The study's results confirm that entrepreneurial behaviors affect a hotel's performance. This is in line with numerous studies that have evidenced such an impact in tourism firms (e.g. Palacios-Marqués *et al.*, 2017; Peters and Kallmuenzer, 2018; Tajeddini *et al.*, 2020; Alrawadieh *et al.*, 2021). However, the results indicate that different entrepreneurial behaviors are effective depending on the performance type (market performance versus firm growth). This somehow confirms the findings of Kallmuenzer *et al.* (2019), who observed that different combinations of entrepreneurial behaviors can lead to an increase in a firm's performance.

Table 6. Summary of mediating effect test

Path	Direct effect (c')	Indirect effect ($a \times b$)	VAF	Relevant hypothesis	Hypothesis confirmation
PR → MP	0.326**	0.072	18.1%	$H4_{pr}$	Not confirmed
PR → FG	0.016	0.082*	83.7%	$H5_{pr}$	Confirmed
IN → MP	0.161	0.094*	36.9%	$H4_{in}$	Confirmed
IN → FG	0.278*	0.108*	28.0%	$H5_{in}$	Partially confirmed

Note(s): *** p-value <0.001; ** p-value < 0.01; * p-value <0.05

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The current results regarding proactiveness confirm its impact on tourism firm performance, which was previously reported by Fadda (2018) and Njoroge *et al.* (2020). Specifically, this study unveils that proactiveness affects market performance while not having a significant influence on firm growth. In turn, innovativeness positively impacts firm growth, while it does not significantly affect market performance. This augments our understanding of the importance of innovativeness in the hospitality industry, which was previously reported by Kallmuenzer and Peters (2018) and Hernández-Perlines *et al.* (2019). The results of this study highlight the role of innovative solutions for the long-term development of the tourism industry (Wang *et al.*, 2016). Both proactiveness and innovativeness affect digitalization; this confirms the previous findings regarding the role of EO (Penco *et al.*, 2022) and innovativeness (Kraus *et al.*, 2019; Agostini *et al.*, 2020; Penco *et al.*, 2022) in the digital development of a company.

The current study corresponds with numerous studies regarding the relationship between digitalization and performance (Teece, 2018; Chatterjee *et al.*, 2020; Liu *et al.*, 2022). In particular, it confirms the role of digital technologies in the hospitality industry (which has been reported in previous studies; e.g. Zhang *et al.*, 2017, and Doborjeh *et al.*, 2022). Specifically, digitalization positively affects both hotel growth and market performance; this observation confirms the findings of other studies that were focused on the digitalization–performance relationship in the tourism sector (Hashim and Murphy, 2007) as well as digitalization's impact on hotel growth (Martin-Rojas *et al.*, 2014). Additionally, this study's findings correspond with studies that have demonstrated the role of digital entrepreneurship in increasing a firm's performance (Sion, 2019; Zahra, 2021).

This study confirms that the effect of performance antecedents can be mediated by other factors (as has been indicated in recent studies on the hospitality industry; e.g. Woo *et al.*, 2019, Yang *et al.*, 2017, Kim and Lin, 2021, and Pereira-Moliner *et al.*, 2021). This study shows that the relationship between entrepreneurial behaviors and a hotel's performance can be mediated by digitalization. This observation corresponds with the study of Tsou and Chen (2021), who reported the mediating role of digitalization in the innovation-performance relationship. The results of this study can explain the ambiguity regarding the effectiveness of implementing digital solutions (Hanelt *et al.*, 2021) – according to our results, the types of results as well as any associations with other factors need to be considered to fully understand the role of digitalization.

Conclusions

Summary of findings

Our study confirms the positive impact of an entrepreneurial approach (embodied in proactiveness and innovativeness) on a hotel's market performance and firm growth. The results confirm the positive role that digitalization can play as a mediator in this relationship. Moreover, our findings indicate those configurations (models) of digitalization and dimensions of EO that can lead to market performance and firm growth.

Contribution

This study contributes to the literature on firm digitalization; in particular, it shows that digitalization impacts both market performance and firm growth. Additionally, digitalization is affected by proactiveness and innovativeness. Moreover, this study has unveiled the mediation effect of digitalization on the entrepreneurship–performance relationship in the hospitality industry. The latter findings contribute to the digital entrepreneurship concept.

This study contributes two-fold to the ongoing discussion regarding the impact of entrepreneurship on firm performance. First, this study examines the relationships between

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the dimensions of entrepreneurship (proactiveness and innovativeness) and performance (market performance and firm growth) in detail. As a result, it shows that proactiveness impacts market performance and innovativeness impacts firm growth. Second, this study identifies the mediating effect of digitalization. Such an effect enables us to explore the mechanism between an antecedent and a consequent variable; in this case, digitalization specifies how entrepreneurship affects a firm's performance.

In particular, digitalization fully mediates the proactiveness–firm growth association and the innovativeness–market performance link, and it partially mediates the innovativeness–firm growth relationship. Additionally, this study contributes to the literature on entrepreneurial orientation (particularly its multidimensionality – Lumpkin and Dess, 1996), as it has identified the complex interplay of proactiveness and innovativeness (which are EO dimensions) with digitalization.

With its findings, this study contributes to the hospitality management literature. In particular, it highlights the role of entrepreneurship and digitalization in increasing market performance and hotel growth. In the context of tourism entrepreneurship, this study explains the associations among the dimensions of entrepreneurship and performance.

Managerial implications

This study offers implications for managers and policy-makers. Hoteliers can observe that different entrepreneurial behaviors should be activated depending on which results are to be obtained (proactiveness to increase market performance, and innovativeness to achieve firm growth). When a hotel is to improve its digital development, it is worth increasing both proactiveness and innovativeness (which positively affect digitalization). In turn, digitalization impacts both market performance and firm growth. The observed relationships, including the role of digitalization, can be significant for policy-makers who are responsible for supporting business development, in particular within the tourism industry. The development of tourism entrepreneurship can positively impact society, for example, by improving the offer for tourists as well as the living conditions of tourism entrepreneurs. This can be important in the recovery of the economy after the crisis.

Limitations

This examination has some limitations that need to be considered when generalizing its findings. First, the sample represents a part of the hospitality industry (one- and two-star hotels) and a single country (Poland). Consequently, the identified ties among the variables may not be valid in other industries or other segments of the hospitality industry. In a similar manner, they can be irrelevant in other locations (which can be determined by social and economic backgrounds as well as the degree of the digital development of a country).

Finally, the obtained results could have been impacted by the COVID-19 crisis, as the data were collected during the fourth wave of the pandemic that was caused by the virus. As numerous entrepreneurs were seriously affected by the crisis (including hoteliers), they were forced to limit or postpone their investments. Despite the fact that digitalization can seem helpful for mitigating the impact of a crisis, these limitations in investments can refer to digitalization as well. Consequently, similar surveys from before and after the COVID-19 crisis could provide differing results.

Recommendations for future studies

Based on the limitations indicated above, we can recommend at least three avenues for future research. First, similar studies can be replicated within other segments of the hospitality industry (as well as in other industries). Second, studies that focus on other locations (that are

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different in terms of their degrees of social, economic, and digital development) can augment our understating of the investigated relationships. Third, a similar study can be conducted in the future under different market conditions (e.g. during economic prosperity) when entrepreneurs are more capable of investing in digitalization.

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