Extending UTAUT with competitive pressure for SMEs digitalization adoption in two European nations: a multi-group analysis

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Abstract

Purpose – In this article, the authors draw-upon an extended unified theory of acceptance and use of technology (UTAUT) and propose a research model involving performance expectancy (PE), effort expectancy (EE), facilitating conditions (FC) and competitive pressure (CP) as potential salient factors explaining the adoption of digitalization in European SMEs. The authors also postulate that there may be cross-cultural differences, thereby leading us to include the country as a moderator in the model.

Design/methodology/approach – The authors validate this model with a cross-cultural sample involving 188 owner-managers from the Czech Republic and Slovakia and through the partial least square structural equation modeling (PLS-SEM) techniques as well as multi-group analysis.

Findings – The results using the study's global dataset indicate that PE, FC and CP significantly affect owner-managers intentions toward digitalization in SMEs. The authors' application of the multi-group analysis also suggests that although the two countries differ in digitalization adoption intention, the differences are statistically insignificant. In the conclusion, the authors highlight several implications these findings have for theory and practice.

Practical implications – The authors recommend that the providers of emerging digital technologies should improve on the performance features of those technologies and ensure they are relevant to the SMEs. By doing so, the adoption of digitalization will grow, because owner-managers of SMEs will have the confidence that adopting such technologies will improve their operations. Second, SMEs are required to provide adequate organizational and technical infrastructure to support digitalization adoption.

Originality/value – Aside from being among the few attempts to extend the explanatory power of UTAUT with PE, EE, FC and CP in investigating digitalization adoption in SMEs context, this study also validates its model with rigorous methodological approach as well as three datasets (global, Czech Republic and Slovakia) thereby strengthening the validity of the results.

Keywords UTAUT, SMEs, Digitalization, Competitive pressure, Multigroup analysis, MICOM

Paper type Research paper

Introduction

The rise of new digital tools such as big data, artificial intelligence, cloud computing, smart manufacturing and the internet of Things (IoT) is changing how businesses function and companies interact with stakeholders (Ghobakhloo and Ching, 2019). These new technologies that

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underlie digitalization have become necessary to face the volatile corporate world (Garzoni *et al.*, 2020). Accordingly, the future competitiveness of the European economy hinges on the capacity of Small and Medium-Sized Enterprises (SMEs) to adopt digitalization and pursue more agile approaches to knowledge creation (OECD, 2020). SMEs play a vital role in the European economy, making up 99% of the total businesses and representing two-thirds of employment (European Commission, 2020). Nevertheless, despite their relevance, there remains a significant digital gap between SMEs and large companies. As with any other business, SMEs operate in a volatile environment, and to stay competitive means SMEs have no option other than to work on their internal processes and resources with the help of digital technologies. The current generation and their consumption pattern and preferences also push SMEs towards digitalization. For instance, the younger and technologically perceptive generation wants eco-friendly, better-quality products and almost immediate delivery of services. Aside from the competition and generational effect, world crises such as the COVID-19 pandemic make it imperative for SME digitalization (Bianchini and Kwon, 2021). For example, there was a 70–80% drop in revenues/sales among SMEs in Organization for Economic Cooperation and Development (OECD) countries (OECD, 2020). Nevertheless, in many cases, the disruption caused by the crisis was lessened by digital solutions (Abdulkarem and Hou, 2021; Drydakis, 2022).

Literature is replete with the positive effect of digitalization on large companies (Pedauga *et al.*, 2022) but minimal in the case of SMEs due to several factors, including the affordability of digital technologies (Naushad and Sulphey, 2020), implementation difficulties (Cassetta *et al.*, 2020). Indeed, many factors may influence SME digitalization decisions, although the literature is scant. Against this background, this study investigates the factors which underpin SME digitalization adoption in the European context. Specifically, it seeks to answer the question, "What factors influence SMEs' digitalization adoption decisions? To do so, we extend the unified theory of acceptance and use of technology (UTAUT) (Venkatesh *et al.*, 2003) with competitive pressure (CP) to explore core factors affecting SME digitalization adoption. The UTAUT is a comprehensive theory that has been a robust theory baseline in technology adoption studies (e.g. Soong *et al.*, 2020). We also postulate that there may be group differences in SME digitalization adoption decisions and therefore include national context as a moderator.

Theoretically, this study makes two insightful contributions. First, this study extends existing knowledge about the UTAUT with CP, a model applied in the SME digitalization context. Second, by situating this study in Europe, we significantly contribute to the literature by demonstrating how two countries, namely the Czech Republic (Czech) and Slovakia (Slovak), interactively affect SMEs' intentions to adopt digitalization in today's competitive business environment.

The findings of this study could offer insights to SMEs on the need for a digital mindset that could help them attract more customers, which may culminate in the firm's performance. Similarly, the study offers an understanding to SMEs in the manufacturing, trade and service industries of the role of digital technologies in firm performance. With this knowledge, SMEs can grow their businesses by ensuring their technology is around for a while within the foreseeable future.

The remainder of this paper is structured as follows: section 2 reviews the extant literature on the intention to adopt digitalization, followed by theoretical background and hypothesis development in section 3. Section 4 specifies the research methodology, followed by the presentation of results in section 5. Finally, section 6 discusses the findings from this investigation, including theoretical and practical implications for practice, limitations and future research directions. The study ends with the conclusion in section 7.

Theory and concept development

The UTAUT model was developed by Venkatesh *et al.* (2003) as an extension to the technology acceptance model (TAM), and theorizes that when allocated with new technology, four main effect and moderating factors influence firms' decision to accept and use it: performance expectancy (PE), effort expectancy (EE), facilitating condition (FC) and social influence (SI) (Davis, 1989). However, in this study, SI is dropped in favor of CP because we argue that SI is more applicable in adoption decisions at the individual user level. As we will elaborate in the literature review on CP, the mechanism of CP influencing adoption decisions differs from SI, which postulates that individuals decide to adopt new technology based on the belief that other people find it worthwhile that they use it. Certainly, UTAUT is a very comprehensive theory to the extent that it integrates eight other dominant theoretical models: the theory of reasoned action (TRA), TAM, the motivational model (MM), the theory of planned behavior (TPB), the model of PC utilization (MPCU), the innovation diffusion theory (IDT), the social cognitive theory (SCT) and the integrated model of technology acceptance and planned behavior (Venkatesh and Brown, 2001). The reason to consider the UTAUT model is not only due to its applicability —— it has been proven to explain no less than 70% of technology acceptance behaviors in heterogeneous contexts and locations (Soong *et al.*, 2020) — but also because it allows the researcher to contemplate the technological, social and human spheres of the technology adoption process and its subsequent use. The proposed model aims to extend the UTAUT model and, inspired by technology acceptance literature, poses constructs to develop a framework to predict the intention to adopt digitalization among SMEs. These constructs are detailed below.

Hypotheses development

Performance expectancy

PE, also referred to as perceived usefulness (PU) (Venkatesh *et al.*, 2003), is defined as the degree to which an SME manager believes that a digital system will yield some gain in job performance (Davis, 1989). It is a key parameter for SMEs due to reduced margins (Venkatesh *et al.*, 2003). Constantly, the UTAUT model proves that PE is the strongest predictor of technology adoption (El-Masri and Tarhini, 2017). Again, the UTAUT model posits that managers are often more likely to engage in a given behavior when they expect to obtain some positive rewards from it (Bandura, 1977). Given the possibility of such rewards, managers have a high predisposition to develop positive attitudes and liking towards the given behavior (Compeau and Higgins, 1995) Therefore, consistent with TAM and UTAUT, PE is included as a predictor of the intention to adopt digitalization, to the extent that SME owners are more likely to implement a technology when they expect that this innovation will generate positive productivity impacts (Soong *et al.*, 2020). Moreover, some empiricist and technological researchers have stated that PE is the strongest predictor of the intention to use a particular system or technology (Cheng, 2019), and may represent a fundamental component in the decision of SMEs to adopt a digital system. Consequently, we hypothesize that.

H1. PE positively affects the intention to adopt digitalization in SMEs.

Effort expectancy

Effort expectancy, analogous to the perceived use of use (Davis, 1989), refers to the degree to which a digital system is perceived as free from effort or user-friendly (Mohammadyari and Singh, 2015). Some academics have proved the significance of the construct and have stated that managers enhance intentions to adopt digitalization for their companies if they perceive the innovation will be easy to use and will not represent a learning challenge for employees (Razak *et al.*, 2017; Soong *et al.*, 2020). Again, a manager who perceives a new technology as easier to adopt for his company is more likely to make a positive decision to adopt it and engender the intention to use it. According to various academicians, SME managers will strengthen their intentions to adopt a digital system to the extent that it does not represent a considerable effort (Wismantoro and Susilowati, 2021). This is consistent with findings in the studies conducted by Saadé and Bahli (2005) and Razak *et al.* (2017), which summarize that SME owners often attach great importance to the ease of use of digital tools for their enterprise activities. Accordingly, we also hypothesize that.

H2. EE negatively affects the intention to adopt digitalization in SMEs.

Facilitating conditions

FC refer to managers' perceptions of the available resources and support to perform a behavior using a digital system (Venkatesh *et al.*, 2003). Here, FC construct describes the extent to which an SME believes in the presence of sufficient technical infrastructure for the utilization of a specific technology, whenever required (Teo and Noyes, 2014). Numerous studies have highlighted the crucial role that FC play in the intention to adopt digitalization among SMEs (Alhaimer, 2019; El-Masri and Tarhini, 2017). Moreover, the trust of SMEs in the availability of a certain organizational or technical backup, in case of any eventuality, influences their intentions to use a technology, explicit resource determinants (e.g. formal training, guidance, infrastructure) and technological factors (e.g. system compatibility) (Ajzen, 1991). According to Moghavvemi *et al.* (2012), FC play a significant role in adopting an IT innovation and serve motivating factor, which generate a positive impact on the use of technology for purchasing products or services. Therefore, we hypothesize.

H3. FC positively affects intention to adopt digitalization in SMEs.

Competitive pressure

CP in this study refers to the force exerted by business environmental factors which may compel SMEs to adopt a digital innovation (Kurnia *et al.*, 2015). According to Ghobakhloo *et al.* (2011), SMEs are extremely susceptible to impositions by larger competitors. Competition, as previously stated, generates a different impact upon SMEs than on larger firms. According to Alrousan *et al.* (2021) the pressure generated by marketing dynamics regarding novel technology has compelled SMEs to adopt digital technologies. Indeed, managers are pressurized by the technological systems that competitors adopt (or intend to adopt), to the extent that technological relegation can mean the loss of competitiveness and, consequently, a potential financial risk (Conner *et al.*, 2015). Indeed, CP could be akin to SI in UTAUT, but it is imperative to note that their application is context-sensitive. Accordingly, in this study, we argue that CP should be preferred to SI in applying UTAUT in firm-level technology adoption. The latter needs to be narrower and elicit the desired response from respondents. To this end, extant studies have noted that SI encompasses "a wide variety of forms, including obedience, conformity, persuasion, social loafing, social facilitation, deindividuation, observer effect, bystander effect and peer pressure" (Izuma, 2017, p. 199). However, CP is more specific and valuable in firm-level technology adoption. With CP, we argue that the competitive environment within which the business operates may become so intense that it naturally pushes managers to adopt the technologies commonly used in that environment. Firms usually adopt digital technologies in the face of competition for survival (Shahadat *et al.*, 2023)and also to avert the economic cost of sitting on the fence (Bothner, 2003). Unlike SI, CP will not mean anything apart from what has been explained. Using the lens of Izuma (2017) in applying SI in firm-level technology adoption could mean that an individual firm is either obeying, conforming, deindividualizing, or being persuaded. Indeed, CP's relationship with firms' technology adoption has been equivocal. Elbeltagi *et al.* (2013) found that CP is not significant in the decision-making process for technology adoption. However, Henao-Ramírez and Lopez-Zapata (2022) found that managers' needs and intentions to adopt a digital technology are intensified by CP. According to Jeyaraj *et al.* (2006), CP is the more decisive determinant for adoption of digitalization in SMEs. However, other academics found that the CP did not play a determining role in the adoption of: e-business among Korean SMEs (Jeon *et al.*, 2006); smart manufacturing-related information and digital technologies (SMIDT) among Malaysian and Iranian SMEs (Ghobakhloo and Ching, 2019); e-commerce among UK SMEs (Quayle, 2002); and e-collaboration among Malaysian SMEs (Chan *et al.*, 2012). Thus, the aforementioned justifications lead to the inclusion of CP as a variable influencing the digitalization intentions of Czech and Slovak SMEs. Consequently, when owner-managers consider that digitalization generates a competitive gain, then innovation is more likely to be adopted. Thus, we hypothesize.

H4. CP positively affects intention to adopt digitalization in SMEs.

The moderating effect of the national context (Czech and Slovak)

We chose to introduce a national context in the role of a moderator, by comparing intentions and adoption behaviors among Czech and Slovak SMEs' owner-managers, with regard to adopting digitalization in their day-to-day operations. The decision to include these two countries and consider a cross-cultural analysis is based on the fact that, despite having similar historical and cultural contexts, the Czechand Slovak have different economic, social and technological realities (OECD, 2021). Accordingly, empirical research has showed the significant influence of national context in analyses of technology adoption behaviors (Howard *et al.*, 2009). In fact, academicians studying the cross-national diffusion of technology have highlighted the relevance of culture and stated that innovation adoption intentions are highly dependent on the socio-cultural environment (Shah Alam *et al.*, 2011; Tan *et al.*, 2009).

Certainly, development of formal rules, systems and structures regulating transaction costs and facilitating business activities, in various countries, has direct implications on managers' digitalization intentions (Erumban and De Jong, 2006). Previous research has utilized cultural frameworks with the aim of clarifying cross-cultural differences in technology acceptance, adoption and use (Mehta *et al.*, 2019). Considering Hofstede's (2001) cultural dimension, managers' PEs would have a greater effect on behavioral intentions in cultures with high levels of individualism, masculinity and lower levels of power distance and uncertainty avoidance. However, cultural models may not be accurate in predicting technology adoption behaviors due to intrinsic limitations (Kruger and Roodt, 2003). Other academics such as Im *et al.* (2011) argue that the differences in adoption behaviors across countries result from diverse macro-level economic and socio-economic features. Furthermore, Lee *et al.* (2013) established that cultural dimensions have significant effects on individual technology adoption decisions in a cross-cultural context.

Subsequently, according to Koisova *et al.* (2018), regional differences among Czech and Slovak markets follow asymmetry in demographic variables, business structures, potential development and infrastructure rates. In the same connection, other authors have explored the impact of COVID-19 on Czech and Slovak SMEs and identified substantial differences in SMEs managers' behavioral intentions in both countries (Cepel *et al.*, 2020). Moreover, recent OECD (2021) reports prove the considerable dissimilarity in digitalization adoption speed, penetration rates, government policies and crisis management. Consequently, we also apply different theoretical lenses in assessing the moderating effect of what the national context can provide us. This will help us to further account for the expected differences among the relationships studied in the two countries. By concentrating on SMEs and employing a multi-group analysis, this research hypothesizes that, national contexts can moderate the elicited UTAUT variables and CPs have an impact on digitalization adoption in a cross-cultural context. We thus hypothesize that.

H5. The country moderates the effects of (a) CP, (b) PE, (c) EE and (d) FC, on the intention to adopt digitalization in SMEs.

The above hypotheses are summarized in the research model shown below (see Figure 1).

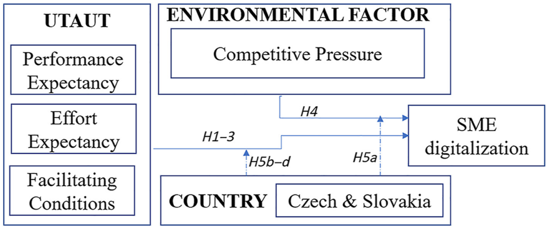

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Figure 1. Proposed research model: H1: Hypothesis 1; H2: Hypothesis 2. H3: Hypothesis 3, H4: Hypothesis 4, H5a: Hypothesis 5a, H5b: Hypothesis 5b, H5c: Hypothesis 5c; H5d: Hypothesis 5d

Research methodology

Questionnaire

The questionnaire was derived from a large research project geared towards understanding possibilities and barriers for industry 4.0 implementation in SMEs within the Visegrad countries (MONOGRAPHY_I4.0_2022.pdf (sjm06.com)) (see link). Considering the requirements of the project, a comprehensive questionnaire was developed based on extant literature and relevant theoretical underpinnings, in order to delve into the opinions and intentions of SME owner-managers regarding the adoption of digitalization in the Visegrad countries (Poland, Czech, Slovak and Hungary). We must emphasize that, the final questions and conceptual frameworks were scientifically accepted and approved by all participating countries. Subsequently, the aforementioned countries participating in the survey were asked to translate the respective questionnaire into their native languages after a series of meetings and theoretical discussions. Consistent with the works of Costa *et al.* (2017), the questionnaire was then back-translated into English by colleagues from different departments in each country, in order to ensure translation equivalence (Brislin, 1970). Finally, the entire questionnaire was pre-tested with 5 owner-mangers of SMEs from each of the Visegrad countries. Respondents from the Polish SMEs had problems with some words and sentence structures translated into their native language; these errors were quickly rectified and amended to ensure accuracy, clarity and coherence in the questionnaire. In sum, we did not experience any other hitches from other participating countries apart from the one stated above. Hence, we proceeded towards data collection. The data collection process started in early August 2021.

Data collection and sampling procedure

For the sake of clarity, data used in this study were culled from data previously garnered from SME owner-managers in the Czech and the Slovak. Again, this study was restricted to SMEs in the manufacturing, trade and service industries, because it represents an engine of growth for many emerging economies including the countries listed above (see World Bank, 2019). Furthermore, there has been little empirical and theoretical focus on the digitalization intentions and adoption decisions of owner-managers, in the context of SMEs in the central and eastern European countries (e.g. Ramdani *et al.*, 2022). In fact, recent investigation carried out by Cepel *et al.* (2020) showed that SMEs in both countries had experienced slow business performance, with business rates falling from 35.7% to 35.3 and 67.8%–62.8%, respectively, before and after pandemic period. Primarily, the notion of digitalization could have sustained, saved or increased production within the SMEs during or before the outbreak of the pandemic. However, whether owner-managers are willing to transition to the digitalized environment is a matter of debate. A visible missing link in this debate is addressing the scientifically validated framework for SMEs owner-managers intent towards digitalization. In this context, all pertinent information related to participating SME owner-managers was retrieved from the Credit Management Report and Information of Companies (CRIBIS) database in both the Czech and Slovak and recorded in an Excel file. We must emphasize, that the current study relied on web-based surveys, specifically not to breach the protocols of the COVID-19 pandemic as at the time of data collection (see Laato *et al.*, 2020). Consequently, a bulk of emails were sent online, containing polite invitations to participate in the study for the cause of scientific research. After a series of telephone calls and email reminders to all participating countries as earlier stated, we recorded a total of 94 and 240 samples each for Czech and Slovak, respectively. However, as mentioned earlier, the emphasis was on manufacturing/production, trade and service firms; so, we automatically deleted responses from other sectors, finally selecting only 89 and 100 responses for our final data analysis. Although the current study is an extension of the Kwarteng *et al.* (2022) work, in treating the Czech dataset of 89, a listwise(case-wise) deletion method was used to delete one case with a missing value. Hence 88 samples were reported as against the 89 in the said comparator work. Kwarteng *et al.* may have used other missing value treatment procedures, such as pairwise deletion, item mean substitution, person mean substitution, or hot-deck imputation. According to the literature, listwise deletion leads to loss of information in the dataset, however, it is the most common technique, and easy to implement and compare univariate statistics (Enders and Bandalos, 2001; Newman, 2003). In addition, we have had to use listwise deletion technique because the number of cases deleted is less than 10% of the sample in question (Schafer, 1999; Bennett, 2001). Schafer (1999) noted that a deletion of cases with missing values of less than 5% immaterial. Consequently, in our study, listwise deletion was more appropriate since the case deleted represents only 1.12% of the Czech sample size. In order to determine whether the sample sizes of 88 and 100 for the Czech and Slovak, respectively, were adequate to test our research model, G*Power statistical software was applied (Faul *et al.*, 2009). Accordingly, G*Power was initiated to help assess the required minimum sample size, to prevent disturbances associated with statistical significance. Based on the results of the G*Power analysis, we needed 74 responses as the minimum sample size from the Czech data, given an effect size of 0.15 at 0.05 significance level and 0.95 as statistical power. Hence, the sample size of 88 responses used for this study exhibited satisfactory statistical power for creating a more robust model. Further, the Slovak data was also found to be adequate, given that the final sample size stood at 100 responses. In sum, three datasets were used in the study, namely Czech data (88), Slovak data (100) and global data (188). The global dataset was formed by adding Czech and Slovak samples. This means apart from assessing our research model with each of the two countries' samples, we also decided to appraise the net effect of two samples put together as global sample. On the profile of the surveyed SMEs, most of the respondents were males in both countries, Czech (73.9% males) and Slovak (53%-males). Similarly, most entrepreneurs who manage or work for SMEs have master's degrees. Specifically, we recorded 71.6% with a master's degree in Czech, which is very similar to their Slovak counterparts (71%). However, we see a sharp contrast in terms of firm age. While majority of SMEs in the Czech had operated for within 10 years, Slovak SMEs have existed for over 20 years. Details of the respondents' demographic information is shown in Table 1.

#	Demography	Characteristics	Czech frequency	%	Slovak frequency	%
1	Gender	Male	65	73.9	53	53
		Female	23	26.1	46	46
		I do not wish to answer	0	0.0	1	1
2	Age of Respondent	18–30	12	13.6	22	22
		31–45	32	36.4	30	30
		46–60	37	42.0	32	32
		61+	7	8.0	16	16
3	Highest education	High School	16	18.2	15	15
		Bachelor	6	6.8	11	11
		Master	63	71.6	71	71
		Ph.D	3	3.4	3	3
4	Rank	Owner	21	23.9	22	22
		Senior manager	29	33.0	25	25
		Manager	26	29.5	35	35
		other staff	12	13.6	18	18
5	Work Experience	Up to 5 years	9	10.2	48	48
		From 6 to 10 years	16	18.2	22	22
		From 11 to 20 years	27	30.7	20	20
		More than 20 years	36	40.9	10	10
6	Number of staff	up to 9	2	2.3	62	62
		10–49	9	10.2	21	21
		50–249	74	84.1	8	8
		more than 250	3	3.4	9	9
7	Business Sector	Production	41	46.6	42	42
		Trade	10	11.4	18	18
		Services	37	42.0	40	40
8	Firm Age	up to 10 years	5	5.7	53	53
		11–20 years	21	23.9	21	21
		21 years and older	62	70.5	26	26

Source(s): Table by authors

Table 1. Demographic characteristics of respondents

Variables and measures

The measurements for this study consisted of two main sections. The first section explored demographics of respondents such as age, gender and the type of SME. The second section included measurement items, which were selected and modified through literature review of related studies using similar constructs as in the current investigation. Scales of specific measurement items and their sources are listed in Appendix 1.

Common method variance (CMV)

Previous literature posits that common method variance (CMV) should be addressed through questionnaire-based studies. This research was not exception to this principle. As the same respondents answered to both the endogenous and exogenous constructs, there was probably a concern about the CMV reported by a single source (Podsakoff *et al.*, 2003). Consequently, to ease the CMV tendency in this study, we followed the recommendations outlined in previous literature. Specifically, we took inspiration from the seminal paper by Podsakoff *et al.* (2012) suggesting both procedural and statistical means to address the issue of CMV. Subsequently, procedural measures were undertaken to mitigate CMV, including: (1) assuring respondents about confidentiality and anonymity, right at the beginning of the questionnaire, (2) positioning the items used in measuring both endogenous and exogenous variables, away from each other and, (3) informing the respondents prior to filling the questionnaire and via the headings that, their responses would be used only for scientific analyses and that there was no right or wrong answer. As mentioned earlier, we also adopted statistical methods to counter CMV. First, we examined the signal with respect to CMV using the well-known Harman's unrotated factor analytic technique, and our results indicated that the variation of the most dominant factor is below the 50% threshold limit. Again, we used the full collinearity approach as a statistical standard for evaluating the presence of CMV (Kock, 2015). Results garnered from Kock's (2015) recommendation showed that none of the VIF values, be it at the manifest item or construct-level, surpassed the conventional baseline of 3.3. Consequently, we concluded that CMV was not a serious problem in this study.

Data analysis

The statistical objective of this study is both exploratory and predictive in nature. In such cases, the partial least square structural equation modeling (PLS-SEM) method has been deemed fit for use by scholars such as Hair *et al.* (2019). Moreover, current research works regarding adoption intentions and decisions have utilized PLS-SEM (Kwarteng *et al.*, 2022; Ntsiful *et al.*, 2022). Indeed, SEM has been a given a stamp of approval in most extant quantitative studies (Ghasemy *et al.*, 2020; Wang and Lin, 2019). In addition, SEM also has the penchant to detect measurement error using observed variables (Hair *et al.*, 2014). Moreover, it does not match first generational statistical algorithms, such as linear regression and correlations, which study the relationship with one dependent variable, within a specific time, resulting in misleading results in the case of mediated relationships (Iacobucci, 2009). Whereas SEM as a second generational statistical method, provides prospects to simultaneously test all causal relationships between observed and latent variables. Thus, SEM integrates multiple regression and factor analyses, by arriving at fit indexes (Iacobucci, 2009; Tabachnick *et al.*, 2007). This study, therefore, adopted the traditional PLS algorithm with bootstrapping set to 5,000 sub-samples and no sign changes. Finally, all analysis was performed using SmartPLS 3.3.2 (Ringle *et al.*, 2015).

Results

Measurement model assessment

Consistent with the recommendations in existing literature (Hair *et al.*, 2012; Kock, 2014) and as part of measurement model requirements in the dataset used for this study, both manifest and latent variables were examined. For this, first factor loadings were assessed by examining indicator loadings of each construct, considering both global data and the data from the two nations. Consequently, all measurement items, which did not meet the minimum threshold loading of 0.70 (Hair *et al.*, 2012) were dropped. Afterward, the Cronbach's Alpha (CA) and the Composite Reliability (CR) statistics were used as the baseline for internal consistency reliability. Empirically, a good metric coefficient of both CA and CR statistics should always be equal to or higher than 0.7 (Nunnally *et al.*, 1967). In our case, the results, as shown in Table 2, revealed that all the coefficients of CA and CR were above the minimum baseline of 0.70, which is an indication of sufficient internal consistency (Nunnally *et al.*, 1967). In order to achieve convergent validity, the Average Variance Explained (AVE) was used to measure the extent to which the construct converges explained the variance of each item/indicator (Hair *et al.*, 2019). The results garnered from our AVE values meet the minimum acceptable threshold of 0.5, thus approving convergent validity (Hair *et al.*, 2019).

Finally, three criteria, namely Fornell and Larcker's criterion, cross-loading and Heterotrait Monotrait (HTMT) ratio were adopted to gauge discriminant validity in this study. The Fornell-Larcker criterion posits that the square root of the AVE of each construct

Table 2.
Assessment of measurement model [Loadings, CA, CR, rho_A and AVE]

Construct	Items codes	Factor loadings Global n = 188	Factor loadings Czech n = 88	Factor loadings Slovak n = 100	CA Global	CA Czech	CA Slovak	rho_A Global	rho_A Czech	rho_A Slovak	CR Global	CR Czech	CR Slovak	AVE Global	AVE Czech	AVE Slovak
Competitive	CMPR1	0.966	0.988	0.886	0.938	0.975	0.832	0.95	0.976	0.964	0.97	0.988	0.919	0.941	0.976	0.85
Pressure	CMPR2	0.974	0.988	0.957												
Effort	EEXP1	0.895	0.907	0.87	0.916	0.947	0.865	0.917	0.952	0.871	0.941	0.962	0.908	0.798	0.863	0.712
Expectancy	EEXP2	0.888	0.946	0.844												
	EEXP3	0.918	0.937	0.861												
	EEXP4	0.872	0.926	0.797												
Facilitating	FCND1	0.866	0.876	0.781	0.795	0.841	0.701	0.813	0.857	0.776	0.88	0.904	0.826	0.71	0.758	0.616
Conditions	FCND2	0.889	0.918	0.872												
	FCND4	0.767	0.815	0.691												
Intention	INTD1	0.935	0.954	0.875	0.936	0.953	0.858	0.937	0.958	0.866	0.959	0.97	0.913	0.886	0.915	0.778
	INTD2	0.948	0.971	0.884												
	INTD3	0.941	0.944	0.887												
Performance	PEXP1	0.884	0.874	0.915	0.889	0.863	0.903	0.9	0.885	0.927	0.923	0.906	0.932	0.75	0.706	0.774
Expectancy	PEXP4	0.879	0.832	0.901												
	PEXP5	0.884	0.853	0.876												
	PEXP6	0.817	0.801	0.823												

Note(s): NB: CA-Cronbach alpha, rho_A and CR-Composite Reliability, AVE-Average Variance Extracted. The Table reports all reliability metrics for each of the three datasets (global, Czech and Slovak)
Source(s): Table by authors

should be above the highest correlation matrix with any other construct (Fornell and Larcker, 1981). In this study, the results indicated that all square roots of AVE, which ranged between 0.671 and 0.864 (see Table 2), exceeded the inter-construct correlations. Therefore, discriminant validity was satisfied. HTMT ratio of correlations was used as the robustness check for discriminant validity, by measuring correlations within latent variables against correlations between these variables. The cut-off value was ideally supposed to be below 0.85 (Kline, 2012). The results, as seen in Table 3, indicated that all values are less than the recommended threshold of 0.85. Hence, discriminant validity has been achieved in our study. Again, the confidence interval of each HTMT value in our case, does not include the value 1 for all groupings of the constructs used in the study. Cross loading was also assessed (Table 4), and as loading of the measurement items was found to be higher than any other cross-loadings, the discriminant validity of the model was established.

Structural model assessment

The structural model evaluation result from the SmartPLS 3.3.2 is presented in Table 5, wherein the path coefficient (β), the significance of estimates (t-statistics) and the coefficient of determination (R^2) values are displayed. Indeed, as part of PLS-SEM, structural model assessment involves the examination of the bootstrapping parameters such as the t-statistics, R^2 and β values, in addition to the predictive relevance (Stone-Geisser Q^2), A Q2 value greater than zero indicates that the structural model has predictive relevance, whereas the model is described as lacking predictive relevance when the Q^2 value is less than zero. Accordingly, in this study, the results of the blindfolding assessment indicated that, our structural model using all three datasets produces satisfactory predictive relevance. This is because intention to adopt digitalization in SMES recorded $Q^2 = 0.402$ (globally), $Q^2 = 0.352$ (in Czech) and $Q^2 = 0.25$ (in Slovak). As shown in Table 3, using the global data set, all the hypotheses were accepted except H2 ($\beta = 0.059; t = 1.012; p > 0.05$). This means, PE (H1) ($\beta = 0.452; t = 7.184; p < 0.001$), *FC (H3)* ($\beta = 0.197; t = 3.713; p < 0.001$) *and CP (H4)* ($\beta = 0.121; t = 2.742; p < 0.01$) are found to have a positive effect on the intention to digitalize SMEs. Indeed, using the global data set, our model explains 45.8% of the variance in intention to adopt digitalization in SMEs ($R^2 = 0.458$).

Further, similar results are obtained when we segment the data set into two (Czech and Slovak). Specifically, using the Czech data set, both hypotheses *H1* ($\beta = 0.479; t = 4.225; p < 0.001$) *and H3* ($\beta = 0.244; t = 2.225; p < 0.05$) and are once again accepted, whilst H2 ($\beta = 0.014; t = 0.119; p > 0.05$) *and H4* ($\beta = 0.072; t = 0.886; p > 0.05$) are rejected. This means that, with regard to Czech, our model indicates that FC and PE affect the intention to adopt digitalization in SMEs. On the other hand, CP and EE do not have a significant effect on the intention to adopt digitalization in SMEs. Similar to the global data set result, in Czech, our structural model accounts for 44.7% ($R^2 = 0.447$) variance in the owners'/managers' intentions to use digital technologies in their SME operations.

In Slovak, however, the results differ sharply from that of Czech. Specifically, hypotheses *H1*($\beta = 0.282; t = 1.652; p > 0.05$), *H2*($\beta = 0.085; t = 0.458; p > 0.05$) *and H4* ($\beta = 0.144; t = 1.32; p > 0.05$) are rejected, with the exception of H3 ($\beta = 0.248; t = 2.022; p < 0.05$). That is, UTAUT factors (PE and EE) together with CP have no significant effect on SME digitalization intentions. However, FC are found to have a significant effect on the intention to adopt digital technologies in SMEs. Again, 35.9% variance in the intention to digitalize Slovakian SMEs can be explained by our structural model. Indeed, given the results from all three data sets, we find that FC play a seminal role in the intention to digitalize SME operations. Our model fit results which meet model fitness indices are also displayed in Appendix 2 while the structural equation model (SEM) images of the bootstrapping results are displayed in Appendix 3.

Table 3.
Assessment of discriminant validity [Fornell-Lacker and HTMT]

	Construct	Global (n = 188)					Czech(n = 88)					Slovak(n = 100)				
		1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Panel A: Fornell-lacker criterion																
1	Competitive Pressure	0.97					0.988					0.922				
2	Effort Expectancy	0.13	0.894				0.190	0.929				0.048	0.844			
3	Facilitating Condition	0.222	0.542	0.843			0.251	0.553	0.871			0.252	0.59	0.785		
4	Intention to Digitalize	0.319	0.479	0.514	0.941		0.374	0.427	0.470	0.956		0.269	0.464	0.517	0.882	
5	Performance Expectancy	0.324	0.659	0.572	0.642	0.866	0.498	0.551	0.418	0.624	0.840	0.215	0.798	0.649	0.542	0.88
Panel B: HTMT Criterion																
1	Competitive Pressure															
2	Effort Expectancy	0.139					0.199					0.123				
3	Facilitating Condition	0.258	0.625				0.275	0.612				0.297	0.744			
4	Intention to Digitalize	0.339	0.515	0.591			0.386	0.446	0.521			0.304	0.524	0.62		
5	Performance Expectancy	0.353	0.724	0.678	0.697		0.547	0.594	0.479	0.665		0.216	0.908	0.816	0.595	

Note(s): The Table reports two discriminant validity metrics (Fornell-Lackercriterion and HTMT) for each of the three datasets (Global, Czech and Slovak)
Source(s): Table by authors

Table 4. Assessment of discriminant validity [Cross-Loading]

	Global data					Czech data					Slovak data				
Items/construct	CP	EE	FC	INT	PE	CP	EE	FC	INT	PE	CP	EE	FC	INT	PE
CMPR1	*0.966*	0.091	0.196	0.287	0.267	*0.988*	0.198	0.260	0.364	0.494	*0.886*	(0.070)	0.191	0.183	0.049
CMPR2	*0.974*	0.157	0.232	0.328	0.357	*0.988*	0.178	0.236	0.376	0.490	*0.957*	0.116	0.261	0.292	0.294
EEXP1	0.112	*0.895*	0.483	0.429	0.593	0.217	*0.907*	0.523	0.369	0.473	0.024	*0.870*	0.563	0.376	0.730
EEXP2	0.141	*0.888*	0.468	0.394	0.605	0.146	*0.946*	0.473	0.365	0.501	0.114	*0.844*	0.387	0.337	0.703
EEXP3	0.125	*0.918*	0.495	0.435	0.605	0.230	*0.937*	0.562	0.409	0.538	(0.012)	*0.861*	0.473	0.372	0.685
EEXP4	0.089	*0.872*	0.487	0.449	0.554	0.118	*0.926*	0.494	0.434	0.530	0.041	*0.797*	0.541	0.455	0.587
FCND1	0.172	0.448	*0.866*	0.439	0.477	0.185	0.463	*0.876*	0.433	0.295	0.220	0.465	*0.781*	0.371	0.526
FCND2	0.194	0.549	*0.889*	0.484	0.525	0.280	0.577	*0.918*	0.444	0.461	0.246	0.503	*0.872*	0.525	0.536
FCND4	0.199	0.351	*0.767*	0.367	0.439	0.185	0.388	*0.815*	0.341	0.330	0.084	0.427	*0.691*	0.253	0.482
INTD1	0.282	0.479	0.488	*0.935*	0.621	0.401	0.422	0.422	*0.954*	0.673	0.119	0.431	0.450	*0.875*	0.465
INTD2	0.296	0.451	0.492	*0.948*	0.621	0.346	0.419	0.486	*0.971*	0.581	0.265	0.454	0.504	*0.884*	0.534
INTD3	0.323	0.421	0.471	*0.941*	0.570	0.322	0.380	0.443	*0.944*	0.526	0.328	0.330	0.406	*0.887*	0.422
PEXP1	0.280	0.652	0.513	0.635	*0.884*	0.402	0.599	0.409	0.633	*0.874*	0.234	0.700	0.568	0.508	*0.915*
PEXP4	0.289	0.568	0.478	0.563	*0.879*	0.427	0.438	0.304	0.524	*0.832*	0.171	0.712	0.587	0.563	*0.901*
PEXP5	0.274	0.561	0.516	0.543	*0.884*	0.430	0.376	0.386	0.510	*0.853*	0.147	0.732	0.630	0.441	*0.876*
PEXP6	0.284	0.480	0.473	0.463	*0.817*	0.431	0.401	0.282	0.376	*0.801*	0.212	0.670	0.492	0.351	*0.823*

Note(s): The Table report discriminant validity via cross-loading metric for each of the three datasets (Global, Czech and Slovak). The values in italic are items loading on their respective constructs
Source(s): Table by authors

Table 5. Assessment of structural model [Bootstrapping and Blindfolding procedures]

Data set	Path	Std. Beta	Std. Error	*t*-value	Confidence interval bias corrected LB (5%)	UB (95%)	Decision	VIF	f^2	R^2	Q^2
Global	H1: Performance Expectancy → Intention to Digitalize	0.452	0.452	7.184***	0.348	0.554	Accept	2.166	0.174	0.458	0.402
	H2: Effort Expectancy → Intention to Digitalize	0.059	0.059	1.012 ns	−0.037	0.155	Reject	1.938	0.003		
	H3: Facilitating Condition → Intention to Digitalize	0.197	0.199	3.713***	0.107	0.283	Accept	1.611	0.045		
	H4: Competitive Pressure → Intention to Digitalize	0.121	0.119	2.742**	0.05	0.196	Accept	1.141	0.024		
Czech	H1: Performance Expectancy → Intention to Digitalize	0.479	0.481	4.255***	0.272	0.648	Accept	1.882	0.220	0.447	0.352
	H2: Effort Expectancy → Intention to Digitalize	0.014	0.011	0.119 ns	−0.176	0.206	Reject	1.798	0.000		
	H3: Facilitating Condition → Intention to Digitalize	0.244	0.249	2.225*	0.051	0.412	Accept	1.500	0.072		
	H4: Competitive Pressure → Intention to Digitalize	0.072	0.073	0.886 ns	−0.06	0.206	Reject	1.367	0.007		
Slovak	H1: Performance Expectancy → Intention to Digitalize	0.282	0.277	1.652 ns	0.038	0.605	Reject	3.334	0.037	0.359	0.251
	H2: Effort Expectancy → Intention to Digitalize	0.085	0.088	0.458 ns	−0.253	0.359	Reject	2.996	0.004		
	H3: Facilitating Condition → Intention to Digitalize	0.248	0.258	2.022*	0.043	0.443	Accept	1.839	0.052		
	H4: Competitive Pressure → Intention to Digitalize	0.144	0.14	1.32 ns	−0.039	0.327	Reject	1.139	0.028		

Note(s): NB: * = $p < 0.05$; ** = $p < 0.01$; *** = $p < 0.001$; ns = non-significance. The Table reports the results of the structural model for each of the three datasets (global, Czech and Slovak)
Source(s): Table by authors

Assessment of the predictive power of the research model

In addition to assessing the R^2, Q^2, path coefficients and other parameter estimates from the bootstrapping, we also evaluated the out-of-sample power of our model through the PLS-predict procedure (Shmueli *et al.*, 2016). The procedure involves comparing the root mean square error (RMSE) and mean absolute error (MAE), which estimate the number of prediction errors in both the PLS-SEM model (PLS) and the linear regression model (LM). It is expected that the errors (RMSE or MAE) in the PLS should be lesser than the errors in the LM, for all measurement indictors of the dependent variables, to get a high predictive power model, or for the majority of the indicators of the endogenous variables, in the case of a medium predictive power model. Moreover, where the errors in PLS are lesser than that of the LM for a minority of the indicators, then the model is described as having low predictive power. Further, a model lacks predictive power when the errors in PLS are lesser than that of LM, for none of the measurement indicators of the dependent variables. Accordingly, as depicted in Table 6, we conclude that our model has high predictive power based on Czech data and medium predictive power in Slovak, but low predictive power in case of global data.

Multi-group analysis

Further to the first four hypotheses (H1–H4), we also hypothesized that the country moderates the effect of PE, EE, FC and CP, on the intention to adopt digitization in SMEs (H5a-d). To this end, we considered two countries (Czech and Slovak) in a multi-group analysis (MGA). According to Henseler *et al.* (2016), it is important that measurement invariance of composite models (MICOM), is conducted prior to MGA. Indeed, the MICOM procedure through the permutation test in SmartPLS examines invariance in the groups under consideration (i.e. Czech and Slovak) using three steps, namely the assessment of configural invariance, compositional invariance and the equality of composite mean values and variances. The result of the MICOM assessment is demonstrated in Table 7. According to Table 7, the two groups met the requirements of only steps one and two, implying a partial measurement invariance (Henseler *et al.*, 2016) and allowing us to proceed to MGA. Since we have only two groups, extant studies recommend that we conduct the MGA using Henseler's MGA and permutation tests (Henseler *et al.*, 2016). These non-parametric tests first identify differences of path coefficients estimates in the groups. Second, the tests also assess whether the path coefficient differences identified are statistically significant. Contrary to expectation, the results of these tests, presented in Table 8, show that there are no significant differences between the Czech and Slovak in all the four paths relationship, therefore leading us to reject H5a-d.

Data set	Construct	Indicators	PLS RMSE	PLS MAE	PLS Q^2 predict	LM RMSE	LM MAE	LM Q^2 predict	PLS-LM RMSE	PLS-LM MAE	PLS-LM Q^2 predict
Global	Intention	INTD2	0.991	0.799	0.409	0.98	0.787	0.422	0.011	0.012	−0.013
		INTD3	1.083	0.895	0.36	1.086	0.897	0.357	−0.003	−0.002	0.003
		INTD1	1.006	0.807	0.409	0.989	0.784	0.428	0.017	0.023	−0.019
Czech	Intention	INTD2	1.055	0.839	0.344	1.137	0.889	0.238	−0.082	−0.050	0.106
		INTD3	1.15	0.925	0.275	1.273	1.004	0.111	−0.123	−0.079	0.164
		INTD1	0.957	0.756	0.41	1.045	0.81	0.296	−0.088	−0.054	0.114
Slovak	Intention	INTD2	0.857	0.685	0.258	0.829	0.644	0.305	0.028	0.041	−0.047
		INTD3	1.104	0.964	0.167	1.162	0.996	0.077	−0.058	−0.032	0.090
		INTD1	1.055	0.919	0.179	1.059	0.872	0.173	−0.004	0.047	0.006

Note(s): The Table reports the results of the predictive power assessment of the research model for each of the three datasets (global, Czech and Slovak)
Source(s): Table by authors

Table 6. Result of predictive power assessment of research model

Table 7. Measurement invariance assessment using MICOM procedure (Czech vs Slovak dataset)

Composite	Step 1 Configural invariance	C	5% quantile	Step 2 Permutation. p-value	Compositional invariance?	MOD = 0	Step 3a 95% C.I.	Equal means?	VOD = 0	Step 3b 95% C.I.	Equal variance?
CMPR	Yes	1.00	0.98	0.39	Yes	−0.474	[−0.241, 0.246]	No	0.594	[−0.314, 0.297]	No
EEXP	Yes	1.00	1.00	0.92	Yes	0.612	[−0.246, 0.234]	No	0.258	[−0.273, 0.267]	Yes
FCND	Yes	1.00	0.98	0.50	Yes	0.237	[−0.25, 0.236]	No	0.618	[−0.345, 0.325]	No
INTD	Yes	1.00	1.00	0.39	Yes	0.462	[−0.242, 0.237]	No	0.460	[−0.284, 0.274]	No
PEXP	Yes	1.00	1.00	0.61	Yes	0.318	[−0.244, 0.235]	No	−0.046	[−0.326, 0.316]	Yes

Note(s): C-Original correlation; MOD-Mean-original difference, VOD-variance-original difference; C.I.-Confidence interval; CMPR-Competitive pressure; EEXP-Effort Expectancy; FCND-Facilitating condition; INTD-Intention to digitalize; PEXP-Performance Expectancy
Source(s): Table by authors

Table 8. Results of multigroup analysis [Henseler's MGA and Permutation tests]

Hypotheses	Path coefficient (β)								
	Global data (N = 188)	Czech (N = 88)	Slovak (N = 100)	|β diff| (Czech, Slovak)	Confidence interval (95%)	*p*-value [Henseler's MGA]	*p*-value [permutation test]	Supported by Henseler's MGA/ Permutation test	Decision
H5a: PEXP- > INTD	0.452	0.479	0.282	0.197	[0.236, 0.614]	0.170	0.163	No/No	Reject
H5b: EEXP- > INTD	0.059	0.014	0.085	−0.071	[0.089, 0.471]	0.366	0.364	No/No	Reject
H5c: FCND- > INTD	0.197	0.244	0.248	−0.004	[0.033, 0.392]	0.493	0.489	No/No	Reject
H5d: CMPR- > INTD	0.121	0.072	0.144	−0.072	[−0.024, 0.25]	0.298	0.290	No/No	Reject

Note(s): CMPR-Competitive Pressure; EEXP-Effort expectancy; FCND-Facilitating condition; PEXP-Performance expectancy; INTD- Intention to Digitalize. The Table reports the results of the multigroup analysis of the three samples (global, Czech and Slovak)
Source(s): Table by authors

General discussions and conclusion

Our objective in this study is to offer comprehensive assessment of the factors, which underpin the adoption of digitalization in European SMEs context. Drawing on precepts of UTUAT (PE, EE, FC) and CP and using a global dataset, the study finds that PE, FC and CP significantly affect owner-managers' intentions to adopt digitalization in SMEs. These findings are in tandem with extant research (Alrousan *et al.*, 2021; Alhaimer, 2019; Cheng, 2019; El-Masri and Tarhini, 2017; Henao-Ramírez and Lopez-Zapata, 2022; Moghavvemi *et al.*, 2012; Razak *et al.*, 2017; Soong *et al.*, 2020; Wismantoro and Susilowati, 2021). For instance, Alrousan *et al.* (2021) had found that the pressure generated by marketing dynamics has compelled SMEs to adopt e-marketing.

However, the effect of EE on intentions to adopt digitalization in SME was statistically insignificant. This finding is in sharp contrast with extant studies (Razak *et al.*, 2017; Wismantoro and Susilowati, 2021).

Further, FC and CP, once again, are found to be significant predictors of SME digitalization adoption intention, using only the Czech dataset, implying that the current study's findings collaborate with previous research (Alhaimer, 2019; El-Masri and Tarhini, 2017; Henao-Ramírez and Lopez-Zapata, 2022). Specifically, previous study such as Alhaimer (2019) had reported that FC played a key role in SME decision to adopt social media for e-advertisement.

Interestingly, FC is the strongest predictor, as we find this variable to be a significant predictor of owner-managers' intentions to adopt digitalization in SMEs, using any of our three datasets (Global, Czech and Slovak) (Alhaimer, 2019; El-Masri and Tarhini, 2017). On the other hand, EE is the weakest predictor because it turns out to be statistically insignificant in all the three datasets. The current finding on EE and its relationship with the decision to adopt digitalization is at variance with previous research (Razak *et al.*, 2017; Wismantoro and Susilowati, 2021), however, present a phenomenon that is worth noting. As all the three dataset validations show that there is no significant association between EE and intention to adopt digitalization in SMEs, we are tempted to believe that that owner-managers may be familiar with the use of the emerging technologies. In other words, their prior experiences with the use technology may explain this finding. Though we also find some differences between the two countries regarding the intention to use digitalization in SMEs, the differences are statistically insignificant.

Theoretical implications

Theoretically, the first contribution is that the study provides a better understanding of owner-managers' intentions to adopt digitalization in the context of European SMEs, by integrating UTAUT and CP, with country as a moderator, within a single model. Although, there are a plethora of empirical studies on firms' digitalization agenda, (e.g. Axarloglou, 2020; Borchard *et al.*, 2022; Gurkov and Filinov, 2022), extant research leans toward large-size firms and towards investigating the effect of the antecedents of digitalization adoption in isolation from one another (e.g. Eller *et al.*, 2020). This means that our study is among the few attempts to extend the explanatory power of UTAUT constructs: PE, EE, FC along with the CP, to investigate digitalization adoption in SMEs.

The second theoretical implication has to do with the rigorous methodological approach. We validated our model using three datasets (Global, Czech and Slovak) thereby strengthening the validity of our results. Apart from PLS-SEM, we subject our model to multi-group analysis using recent methodological techniques such as the MICOM and MGA. Third, another seminal contribution of this study concerns the investigation of CP. Although the role of CP has been extensively explored in technology adoption (e.g. Ahmad *et al.*, 2018; Cruz-Jesus *et al.*, 2019; Mohtaramzadeh *et al.*, 2018), unfortunately, this construct seems to be overlooked in SME digitalization adoption studies (Denicolai *et al.*, 2021; Dethine *et al.*, 2020; Hervé *et al.*, 2020; Joensuu-Salo *et al.*, 2018). In today's volatile business, CP is relevant in understanding owner-managers' intentions to adopt digitalization, especially in SMEs (Henao-Ramírez and Lopez-Zapata, 2022; Jeyaraj *et al.*, 2006). Our findings suggest that owner-managers are more likely to adopt digitalization in SMEs where CP is high.

In contrast to the theoretical presumption that EE is a causal antecedent to technology adoption (Al-Saedi *et al.*, 2020; Chatterjee and Bhattacharjee, 2020; Rahi *et al.*, 2019), we find no statistical association between these two constructs, implying that owner-managers may be familiar with the use of the emerging technologies.

The findings relating to the country used as a moderator between the independent variables and digitalization adoption among SMEs constitute a theoretical contribution to the body of literature. Our findings on the moderator variable (country) imply that the Czech and Slovak do not differ in their intentions to adopt digitization in SMEs. The two countries, after their separation into individual sovereign countries in 1993 (almost three decades ago), are thought to differ in many respects. But our findings have proved the contrary, especially when it comes to digitalization adoption in SMEs.

Managerial implications

The findings of this study are also important for practice in many ways. First, knowledge of the factors relevant to digitalization adoption can help the European SMEs to improve their performance. For instance, the positive association between PE and intention to adopt digitalization suggests that the providers of emerging digital technologies should improve on the performance features of those technologies and ensure they are relevant to the SMEs. By doing so, the adoption of digitalization will grow, because owner-managers of SMEs will have the confidence that adopting such technologies will improve their operations. Second, given our evidence on the role of FC in the intention of owner-managers to adopt digitalization, SMEs are required to provide adequate organizational and technical infrastructure to support digitalization adoption.

Third, the lack of association between EE and intention to adopt digitalization in European SMEs, as found in this study, however, suggests that owner-managers may be familiar with the emerging technologies, and will not have difficulty using the technology. This is means positive feedback for organizations, which provide infrastructures for digitalization, to maintain or improve these infrastructures.

Limitations and future lines

As is common to survey research, our findings are also subject to several limitations, which need to be highlighted. The first limitation concerns the selection of SMEs in Europe for the study. Although the probability sampling technique (i.e. systematic sampling) was used, which makes our findings generalizable to some extent, we could have considered other European countries, in addition to the Czech and Slovak, which share some similarities due to their past relationship. Accordingly, future studies could apply our model in the Visegrad Four (v4) countries or more European countries. We believe that the results of such comprehensive cross-cultural studies will be more robust.

The second limitation is that the study is cross-sectional, because the data for the study was collected at one point in time. Using the cross-sectional design method, we were unable to track the changes in the process of SME digitalization, with the owner-managers. Therefore, a longitudinal study is recommended in case of future studies. We also acknowledge the limitation of not including more control variables in the current investigation. Specifically, although, in the current study we use country as control to check for observable heterogeneity, we implore future studies to test more demographic variables in the context of SME digitalization research.

Finally, the solely quantitative nature of our study also poses a limitation. Even though our study is quantitative and by extension, its results are generalizable, we recommend that future researchers should adopt a mixed-method approach, which allows for triangulation of findings between the two approaches. According to Salimon *et al.* (2023), the findings from the mixed-method approach are comprehensive and enable the researcher to interpret the quantitative results from a qualitative viewpoint.

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Appendix 1

Constructs	Manifest items
Performance Expectancy (PEXP2) Venkatesh *et al.* (2003) Please indicate your level of agreement with each of the following statements (Likert scale 7-points)	PEXP1-I would find digitalization useful in my job PEXP2-Using digitalized processes enables me and the company to accomplish tasks more quickly PEXP3-Using digitalized processes and services increases productivity PEXP4-Investing in digital technologies enable cost-effectiveness PEXP5-Digitalization impacts the profit and performances of the company PEXP6-My good digital skills increase my chances of getting a raise PEXP7-Digital technologies are useful for my business during the COVID-19 pandemic
Effort Expectancy (EFEX) Venkatesh *et al.* (2003) Please indicate your level of agreement with each of the following statements (Likert scale 7-points)	EFEX1-My interaction with the digitalized working environment would be clear and understandable EFEX2-It would be easy for me to gain digital skills to work in the digitalized working environment EFEX3-I would find digitalized working environment easy to use EFEX4-Learning to operate digitalized processes is easy for me
Facilitating Condition (FCND1) Venkatesh *et al.* (2003) Please indicate your level of agreement with each of the following statements (Likert scale 7-points)	FACD1-The company has the necessary resources to use more digitalized process and services FACD2-The company has the necessary knowledge to use more digitalized processes and services FACD3-The modern digitalization techniques are not compatible with other digitalized processes and services at the company FACD4-A specific person (or group) is available for assistance if difficulties with digitalization at the company arise
Intention to adopt digitalization (INTD) Iacovou *et al.*, 1995; Venkatesh *et al.*, 2012) Please indicate your level of agreement with each of the following statements (Likert scale 7-points)	INTD1-My company intends to digitalize its business processes to a higher extent INTD2-My company predicts that it would introduce more digitalization in the near future INTD3-My Company plans to invest in digitalization more in future
Competitive Pressure (CMPR) Ballantine *et al.* (1998) and Ghobakhloo *et al.* (2011) Please indicate your level of agreement with each of the following statements (Likert scale 7-points)	CMPR1-Business partners who do business with my company think that the company should be more digitalized CMPR2-Business partners who are important to the company think that the company should be more digitalized.

Source(s): Table by authors

Table A1. Constructs and their equivalent measurement items

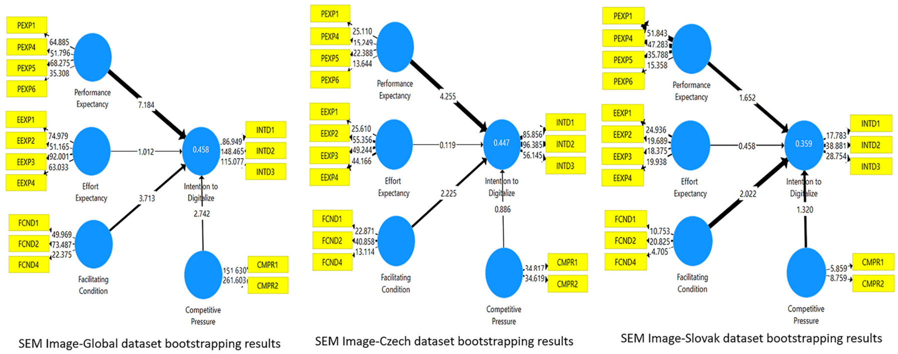
Appendix 2

Table A2. Model fit assessment results

Model fit indices	Global SM	Global EM	Czech SM	Czech EM	Slovak SM	Slovak EM
SRMR	0.047	0.047	0.060	0.060	0.079	0.079
d_ULS	0.298	0.298	0.495	0.495	0.842	0.842
d_G	0.232	0.232	0.391	0.391	0.487	0.487
Chi-Square	574.396	574.396	213.850	213.850	281.255	281.255
NFI	0.884	0.884	0.844	0.844	0.743	0.743

Note(s): NB: SM: Saturated Model and EM: Estimated Model
Source(s): Table by authors

Appendix 3



Source(s): Figure by authors

Figure A1. Structural equation model (SEM) images of results of bootstrapping of the three datasets

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