

# Improving KIBS performance using digital transformation: study based on the theory of resources and capabilities

Improving  
KIBS  
performance

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## Abstract

**Purpose** – The aim of this research is to analyze the success of digital transformation (DT) in the management and performance of organizations. To do so, the role of IT and its ability to integrate in organizations that provide professional services with high added value for their clients are investigated. These services require highly developed skills as they solve complex problems for the clients and this means that success depends on gathering knowledge from different sources (customers, public administrations and competitors). This study analyses the decisive and complementary role of IT in this process.

**Design/methodology/approach** – The analysis combines quantitative and qualitative methods. After questioning managers of Spanish KIBS companies about certain components of DT, the gathered data are subsequently processed with PLS-SEM to establish causal relationships.

**Findings** – The results show that digital capability is the determinant of DT. It has a positive effect on the digital resources integrated in KIBS companies and on their organizational performances.

**Research limitations/implications** – Future research should continue to analyze other components of TD that drive the organizational performance of KIBS firms, such as technological culture or government policies that encourage digital transactions. The present study analyzes data from companies that are part of a single economic sector in Spain which may limit the conclusions drawn. It would be particularly useful to confirm the applicability of the results in companies operating in different markets to explore the direct relationship between digital capability and organizational performance.

**Practical implications** – This research has implications for managers of KIBS companies, as it shows the high potential of the ability of IT to implement and manage a TD process. Managers can benefit from IT management practices using the appropriate tools (ERP, CRM and management software) to gain more knowledge of customer behavior with the possibility of easily codifying and analyzing the data, which significantly influences innovation activities. The objective is to develop a strong internal capability to absorb knowledge from day-to-day interactions with customers by using IT effectively. This process leads to an improvement in the organizational performance of KIBS companies, as they become more



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effective in decision making with improved internal communication, generate greater employee satisfaction and reach new customers. Following strategies aimed at the implementation and use of the technological resources studied creates more agile firms and helps to close the production gap between SMEs and large companies.

**Social implications** – The results obtained can help create sustainable businesses through cloud-based technology tools. It can provide insights for policy makers to implement economic policies that help SMEs to become more competitive and sustainable.

**Originality/value** – The development of digital technologies and the ability to manage them is one of the decisive factors that conceptualizes DT and improves organizational performance. This research contributes to the understanding of the need for managers of KIBS companies to follow strategies oriented towards the digitization of their organizations and for the collaborators to have a high level of IT training, especially in the use of cloud technology.

**Keywords** Digital capability, Digital strategy, Technologies, Organizational performance

**Paper type** Research paper

## 1. Introduction

Digital transformation, as an essential element of the fourth industrial revolution, changes the way we understand organizations (Fachrunnisa *et al.*, 2020). Adapting to these disruptive processes generates the need to learn a range of digital capabilities, which allow the use of a range of strategies promoting digitization and thus stimulating the culture of technological innovation. In this sense, knowledge-intensive professional services can channel the advantages of this technological revolution to create value in the relationships between customers and suppliers (Muller and Doloreux, 2007).

The digitization process in different industrial sectors has been studied in detail in the scientific literature, but there is an absence of scientific work in the service sector in general, and in particular, in companies that offer knowledge-intensive services (KIBS) which are considered facilitators, coordinators and generators of innovation (He and Wong, 2009).

The service sector represents an important part of the GDP of each of the main OECD countries, with forecasts for increases over the coming years (Lin *et al.*, 2013) and it plays a key role in boosting employment and increasing public welfare in these countries (Miles *et al.*, 2017). The services sector contributed 72.80% of the GDP in the United Kingdom, 63.31% of the GDP in Germany and 67.7% of the GDP in Spain in 2020, having increased slightly over the previous fiscal year (Statista, 2022). KIBS should be considered as a service sector industry that uses high levels of technological capital and labor (Lin *et al.*, 2013).

The Fourth Industrial Revolution is characterized by the complete automation and digitalization of organizations with the use of IT and information technologies in both production and services (Benešová *et al.*, 2020). Companies that prioritize acquiring knowledge and using it effectively will be among the first to offer better, faster and less expensive solutions than their competitors (Metcalf and Miles, 2000). Despite this, there is a large proportion, between 50 and 90%, of relevant research that shows failures in the analyzed innovation projects which are abandoned because they involve large investments or are put into practice but do not achieve the expected results (Abdolvand *et al.*, 2008).

Scientific literature has put more emphasis on the innovation of products rather than the innovation of processes as a source of competitive gains (Gallouj and Savona, 2008), which generate changes and improvements in business processes (Horlacher and Hess, 2016; Lizano-Mora *et al.*, 2021; Nwankpa and Roumani, 2016) with the pursuit of DT.

This study examines the factors of innovation management in companies which supply KIBS services. These factors are necessary in order to improve the companies' competitiveness and organizational performance. This has been researched less than the same topic in productive sectors (Benešová *et al.*, 2020). The challenge is to examine how the management of KIBS is affected by certain components of DT, such as, the digital capability, which top management must transmit to the rest of the organization, the strategies followed in the use of information

technology, such as cloud computing, which make real “economies of scale” possible in the provision of services with the use of Internet, reducing costs and increasing scalability (Palos-Sanchez *et al.*, 2017a; Palos-Sanchez *et al.*, 2019b) as well as the corporate use of digital tools and platforms (Concha *et al.*, 2018). Finally, the possible generation of favorable organizational returns provided by a combination of these factors will be considered.

The target population of study are Spanish administrative managers/owners of SMEs throughout the national territory. The professional services they provide support the business processes of clients in the accounting and commercial areas, as well as providing standardized services by processing the administrative procedures of different public administration agencies on behalf of the clients. These companies have been selected due to their national importance.

The main research question is “What factors of digital transformation drive organizational performance in KIBS?”.

This main question is further subdivided into the following sub-questions: How does the digital capability of KIBS mediate the relationship between digital business strategy and the digital technologies used? What is its effect on performance? And, does management measure the digital technology implemented and the organizational performance?

To answer the above research questions, this study applies structural equation modeling (SEM) to validate the correlation between the structures of the research model from a sample of 335 participants. The researchers expect the study to provide theoretical initiatives on organizational behavior and knowledge management in order to conceptually describe digital transformation and give practical implications for improving firms’ capabilities of innovation.

The rest of the document has the following structure. Section 2 presents the theoretical framework that develops the theory of resources and capabilities as the basic pillar of the study, followed by the definition of the digital strategies used, management support focusing on the transformational leader and organizational performance. Section 3 develops the conceptual framework and elaborates the hypotheses, modeling the concepts defined in the previous section to analyze behavior in the management of KIBS as activators of DT and also studies the implication on organizational performance. Section 4 describes the methodology used. Section 5 reports and discusses the results of the analysis while section 6 presents the discussion and finally, section 7 presents the conclusions.

## 2. Theoretical framework

KIBS companies are key factors in a knowledge-driven society and contribute decisively to economic value (Consoli *et al.*, 2015). They offer highly qualified services with high added value for which specialized knowledge, advanced technologies and innovative strategies are needed (Miles, 2005; Miozzo and Grimshaw, 2005). The two central characteristics of KIBS are knowledge and services, but unlike other activities in this sector, where the corporate purpose is centered on services, KIBS are mainly concerned with generating knowledge and the services are less important in their catalogue (Chung and Tseng, 2019).

Digital transformation in companies requires multidisciplinary changes in area like strategy, organization, information technology and the supply chain (Verhoef *et al.*, 2021). With this multidisciplinary vision of resources, the company gains a competitive advantage and optimal results from a suitable combination of valuable, scarce, inimitable and irreplaceable resources and capabilities. In this sense, one of the biggest barriers to successful transformation is the lack of human resources with the appropriate digital knowledge and skills (Nguyen *et al.*, 2015).

KIBS companies play a central role in transforming knowledge bases and competencies in organizations by promoting the development of employees’ skills (Strambach, 2008). In addition, the services offered are a useful source of knowledge for example the preparation of

audit reports and tax reports, which support clients' business processes (Miles *et al.*, 1995). The services provided solve different business problems for clients, such as legal and accountancy issues, along with the application of information technology, etc. with their expertise and by transforming and compiling knowledge (Scarso and Bolisani, 2012). Therefore, KIBS firms are innovative and motivate the transfer of knowledge and innovation in their clients by employing highly qualified personnel and the active use of professional knowledge characterizes these companies (Consoli *et al.*, 2015).

This means that there is a need to study the processes carried out for innovation management in KIBS, using a theoretical approach based on resources and capabilities (Agarwal *et al.*, 2010) analyze how DT-related components impact KIBS companies and show that digital technologies create changes that trigger strategic responses from organizations which seek to alter methods of value creation while managing structural changes and organizational barriers, which affect the different positive and negative outcomes of the process (Vial, 2019). How well technology has been implemented in an organization is not the relevant point, but rather how the technology is managed (Lu and Ramamurthy, 2011). The technological capabilities and competencies are important resources for the innovation process (Renko *et al.*, 2009). Digital technologies in KIBS companies play a central role in this scheme which the literature describes as inherently disruptive (Karimi and Walter, 2015), and the strategic response to technological innovation changes the way value is created (Huang *et al.*, 2017). This change in the digital capability of the organizations allows the creation and production of new products and processes using the talent and expertise gained (Khin and Ho, 2019).

Based on the above, the following section explains the possible factors for this study.

### *2.1 Digital capabilities and technologies*

The resource-based theory considering the tangible or intangible assets of a firm that generate a competitive advantage provided they are valuable, company-specific, non-substitutable and difficult to imitate by competitors (Bharadwaj, 2000) has been previously studied and reported in the scientific literature on the subject. Likewise, Teece (2007) developed the theory of dynamic capabilities, which is the company's ability to integrate, build and reconfigure internal and external competencies to cope with disruptive environments. This phenomenon has received considerable attention from researchers in recent years to explain how firms can maintain a competitive advantage and achieve superior performance (Sousa-Zomer *et al.*, 2020). The dynamic capabilities approach extends the static perspective of the resource-based view of the firm, as it focuses on the modifications made to the organization's resources to adapt to the changing external environment to ensure the survival of the company (Schilke *et al.*, 2017).

Managing digital transformation can be challenging for KIBS, but companies must do it to effectively direct resources and capabilities (Liu *et al.*, 2011). This means the dynamic capabilities approach is a suitable way of calculating the effects of information systems or capabilities in organizations (Contractor *et al.*, 2017; Rialti *et al.*, 2018). In this theoretical field, dynamic capabilities can be considered as digital, which is understood as the organization's ability to create new services and processes which respond to disruptive factors in the market. Initially, organizations need sufficient levels of digital IT capabilities to enable them to handle digital technologies as a basis for innovations (Nwankpa and Datta, 2017).

Today's digital technologies are very flexible and accessible, which makes them useful tools for small and medium-sized enterprise (Goswami and Kumar, 2018; Škare and Soriano, 2021). Technological progress is underway not only in the industrial sector, but also in the service sector, empowering two types of emerging technology, the first originating from the development of information technology (AI, Big Data, augmented reality, advanced robotics) and the second caused by increased connectivity (mobile Internet, social networks, Internet of things, the cloud and blockchain) (Brynjolfsson and Mcfee, 2014). This technological

disruption is also affecting the knowledge-intensive sector (Susskind, 2017), including KIBS companies. The combined effect of all these technologies is still unknown and although they are likely to have a considerable impact on professional services firms, so far there is not enough research to substantiate such a claim (Breunig and Skjolsvig, 2017). The special interest in Big Data technology for the provision of innovate activities for professional service providers, based on knowledge management to create value and generate competitive advantages has been previously studied (Urbinati *et al.*, 2019). Using the internet of things, multiple devices with sensors can be connected to the internet and used to optimize existing business processes and reduce the resources used (Du *et al.*, 2016). Other emerging technologies used for DT and stimulate service innovation in organizations are artificial intelligence, virtual and augmented reality and blockchain technology (Huang and Rust, 2018; Liu *et al.*, 2018). Mobile and online platforms are proliferating to help service companies engage with their customers (Alhathal *et al.*, 2019).

This study analyzes easily accessible digital tools because the KIBS in the study are all SMEs which cannot afford expensive, high-risk investments (Weill and Aral, 2006). The study focuses on digital technologies for cloud computing (Palos-Sanchez, 2017) and the use of professional services management software (CRM, ERP and APP), considered as support tools for the integration, connection and automation of business processes (Saura *et al.*, 2020).

### *2.2 Digital strategy and the view of senior management on the transformational leader*

The digital strategy in companies is a decisive factor in digital transformation (Evans, 2017). It stimulates the reform of business infrastructures and improves communication in companies (Westerman *et al.*, 2014). In this transformative field, the literature highlights the importance of adequately managing the strategies for investment in technologies (Holotiuk and Beimborn, 2017; Nadeem *et al.*, 2018).

The digital strategy is an organizational strategy which is designed and implemented to incorporate digital resources and generate a differential value (Bharadwaj *et al.*, 2013). It should be considered as a strategy at organizational level rather than functional level using information technology, since the objective is to generate value for the company by including technology to restructure the business model (Chi *et al.*, 2016; Kahre *et al.*, 2017). The use of digital strategies has benefits for companies in terms of efficiency and operational performance, as they provide a superior customer experience (Setia *et al.*, 2013; Yadav and Pavlou, 2020).

Therefore, the study analyzes the concept of digital strategy as a response to the competitive environment that is disrupted by DT, as a high-level phenomenon (Li *et al.*, 2016), which requires a response from the organization.

The efforts made by top management to change the way a company is managed are an essential way to fulfill its objectives (Alhaqbani *et al.*, 2016). The staff needs the support and commitment of top management when faced with strategic changes to provide them with guidelines and the appropriate management framework so that they can put the necessary time and effort into adopting the changes (Cole *et al.*, 1993).

The support of management is essential to successfully achieve the digitization of an organization (Berghaus and Back, 2016; van Dierendonck and Sousa, 2016). The management must have adequate knowledge of information technology and also use a transformational leadership style to motivate employees by offering them a compelling vision of the future, meet their needs and transmit the knowledge needed for innovative solutions to business problems (Bass, 1990). This leadership style provides an organizational culture of creativity and innovation (García-Morales *et al.*, 2012; Jung *et al.*, 2008).

The leader plays a critical role in the successful adoption of digital technologies in increasingly disruptive organizational structures and increasingly collaborative business environments (Li *et al.*, 2016).

2.3 Company performance

The performance of a KIBS company measures its success or failure and determines the achievement of the company objectives (Richard *et al.*, 2009). Every organization aspires to obtain maximum performance and thus build a solid reputation in order to have a competitive and enduring presence in the market (AlMulhim, 2021).

Performance can be measured with financial and non-financial indicators because of its multifaceted nature due to the large number of stakeholders interested in knowing about it (Marchand *et al.*, 2002). However, financial performance indicators (ROA or ROI) give a traditional and biased business view of organizational performance. To complement this when assessing performance (Gu and Jung, 2013), suggests the inclusion of the effects of non-financial aspects such as, quality, efficiency and innovativeness.

Previous studies used different indicators to measure organizational performance (Cania, 2014). Mokhtar (2017) considered four different categories of organizational performance, financial aspects, intellectual capital, tangible and intangible benefits and the company balance sheet. Other authors measured organizational performance from the ability to acquire and manage resources to achieve objectives (Ali *et al.*, 2018). Eklof *et al.* (2020) proposed eleven indicators to measure the optimization of resources. These include rate of introduction and success of new products, return on investments, market share growth, customer satisfaction, etc. Human performance metrics, such as employee retention and motivation along with other aspects such as customer satisfaction, sales, profit margins, have also been used (AlMujaini *et al.*, 2021).

Ultimately, performance shows the strengths and weaknesses of KIBS companies at the organizational and individual level.

3. Conceptual framework and development of hypotheses

The conceptual model in Figure 1 shows the elements analyzed in the literature review. The hypotheses for this study link some elements of digital transformation to the performance of KIBS companies.

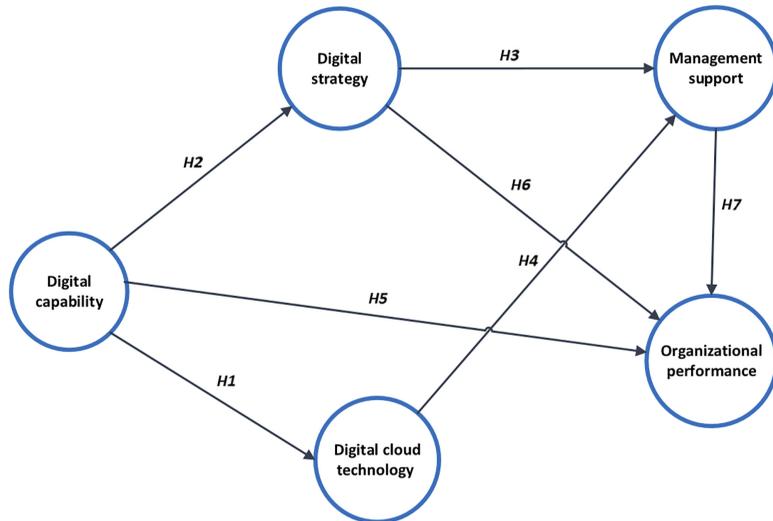


Figure 1.  
Theoretical model

Source(s): Authors own

### 3.1 *The impact of digital capability on technology and strategy*

The most relevant independent variable in this study is digital capability, which is the capacity, talent and experience of a company in managing digital technologies and developing new products (Khin and Ho, 2019). The aim is to investigate how organizations acquire dynamic capabilities to enable them to undertake DT (Vial, 2019). Companies must use the positive effects of technological capabilities in the digital domain (Zhou and Wu, 2010), which requires the optimum level of capabilities of knowledgeable and talented professionals to correctly manage digital technologies ranging from the acquisition of digital technology to the development of new digital solutions. The following hypothesis is proposed using these ideas:

*H1.* Digital capability is positively related to digital cloud technology.

KIBS companies need to use digital or DT capabilities to implement their digital strategy, which involves not only identifying and taking advantage of the opportunities provided by digital technology (Warner and Wäger, 2019), but also having the ability to transform the company resource base (Agarwal and Helfat, 2009). The strategy identifies and promotes the capabilities of information technology and helps the company achieve a competitive position in the market (Schryen, 2013). To ensure the success of DT, KIBS companies have to prepare a digital strategy that suits them based on the following aspects, the use of digital technology, changes in the creation of value, structural changes and financial investment (Matt *et al.*, 2015). The following hypothesis was proposed after considering the above:

*H2.* Digital capability positively affects digital strategy.

### 3.2 *Effect of digital strategy and technology on the support for digital transformation by the company management*

The leadership and support of top management is one of the most important factors for the successful implementation of information systems and changing the organizational culture (Vera and Crossan, 2004). Leaders influence the employees' perceptions of the benefits of digital technology and the positive results gained by adopting it. The manager is the determining factor for the success of ERP (Enterprise Resource Planning) adoption (Al-Mudimigh *et al.*, 2001; Umble *et al.*, 2003). The managers who perform these functions are transformational leaders (Akkermans and van Helden, 2002) and are the people who make up the management of the KIBS companies in this study.

Therefore, the leader's ability to properly align strategy and digital technology to leverage its potential and implementation is considered a critical challenge for companies (Li *et al.*, 2016).

The following hypotheses are formulated with the above ideas:

*H3.* Digital strategy is positively associated with management support.

*H4.* Digital cloud technology is positively associated with management support.

### 3.3 *Effect of digital capability, digital strategy and management support on organizational performance*

One of the results of DT is organizational performance, which reflects the positive impact of digital technologies and the strategies used to change the methods of value creation in a company (Vial, 2019). The literature describes the relevance of integrating technologies into the business to obtain returns (Troise *et al.*, 2022). This capability is called IT capability (Ravichandran, 2018) or digital capability (Proksch *et al.*, 2021).

DT leaders need to ensure that there is a digital mindset in their organizations, and that the disruptions associated with the use of digital technology can be overcome (Benlian and

Haffke, 2016; Hansen *et al.*, 2011). Studies recognize that leadership style can influence the performance of the organization and the HR team (Abarca *et al.*, 2020; Birasnav *et al.*, 2011; Braun *et al.*, 2013; Folgado-Fernández *et al.*, 2020; Garro-Abarca *et al.*, 2021). The management of KIBS companies must be seen as leaders and their commitment to supporting digitization is vital for success (Berghaus and Back, 2016; Schreckling and Steiger, 2017).

The theoretical framework above provides the basis of the following hypotheses:

*H5.* Digital capability is positively related to organizational performance.

*H6.* Digital strategy is positively related to organizational performance.

*H7.* Management support is related to organizational performance.

#### 4. Measurement method

This study used a quantitative research analysis of the results of a self-administered data collection questionnaire.

##### 4.1 Data and sample selection

The data for this study was obtained from an online questionnaire survey designed and created for the managers of the KIBS companies. A pretest (MacKenzie *et al.*, 2011), given to 45 managers, determined the validity, readability and usefulness of the measurement instruments. 618 SMEs received the final questionnaire by email, resulting in a valid sample of 335 companies, with the 54% response rate adequate for the subsequent analysis of the results (Babbie, 2007). The population of SMEs analyzed is drawn using the convenience sample technique.

The data was collected between September and November 2019 in five fortnightly campaigns. The closest professional association to the registered company manager sent an email with an introductory text from the General Secretary of the Administrative Managers Council and a brief description of the purpose of the study, including the link that gave access to the questionnaire.

The companies included in the survey have extensive experience and market penetration and most of them, 42.69%, are more than 25 years old SMEs with a turnover ranging from less than 50,000€ to 500,000€ (85.07%). The KIBS companies surveyed in this study had between 1 and 10 employees (85.38%) and were located in towns with more than 10,000 inhabitants (78.80%) (see Table A1).

##### 4.2 Measurements

The questionnaire included five constructs: digital capability, digital technology, digital strategy, management support and organizational performance. The questions were prepared after consulting various scientific articles dealing with the subject. They were grouped according to the latent variables of DT in order to show the innovation management processes used by KIBS companies. The questions had five possible answers on a Likert scale ranging from 1 = “totally disagree” to 5 = “totally agree”.

The scales included measurements from previous literature to analyze the constructs so that the validity of the content of the survey could be guaranteed (see Table A2). When necessary, the scales were adapted to increase clarity and to fit the research context of certain components of DT such as digital resources and capabilities, digital strategies, support from leaders and organizational performance in a way that complied with standardized procedures (MacKenzie *et al.*, 2011).

The consistency of the scales was validated by calculating the test-retest reliability using the Intraclass Correlation Coefficient (ICC). The analysis included using the two-way mixed effects model and absolute agreement, based on the mean of multiple measurements: eleven

of the digital capability variables, three of the Cloud digital technology variables, ten of the digital strategies variables, three of the leader support variables and twelve of the organizational performance variables (Koo and Li, 2016). The statistical RStudio software version 2022.02.3 + 492 for Windows calculated the ICC in order to find the reliability. The statistical work package installed was `install.packages("psych")`, which includes the `ICC()` function calculating the intraclass correlation as a measure of association when studying the reliability of indicators. This function allows for six ways of calculating ICC, depending on the experimental design chosen (Shrout and Fleiss, 1979) (see Table A3).

The ICC estimate was at a 95% confidence interval, showing an excellent level of reliability. The digital strategies and organizational performance constructs were above 90%, and the rest of the constructs had a good level of reliability with values between 75% and 90% (Koo and Li, 2016). These results show a high degree of correlation and agreement between the measurements and therefore the conclusions are valid (see Table A3).

The selected sample technique has a high internal validity with methodologically sound and trustworthy results (Andrade, 2021).

*4.2.1 Digital capability.* The analysis used nine indicators to measure the digital capability of the companies. Six of them (RA1, RA2, RA4, RA5, CD1 and CD2) show the variety of different information technology resources and assess the capability and commitment of KIBS companies to using digital technology (Khin and Ho, 2019). Resource theory suggests evaluating the information technology capabilities of a company by comparing them with the company competitors (Wiesböck *et al.*, 2020). Items CP2, TR1 and TR2 evaluate this aspect.

*4.2.2 Digital technology.* This construct measures the digital technologies adopted by the organization. The items evaluate the most relevant digital tools used in companies (Troise *et al.*, 2022) highlighting the implementation of document and administrative/tax management software and the improvement of the digital processes in the organization by integrating ERP and CRM using remote access to cloud computing (Nair *et al.*, 2019).

*4.2.3 Digital strategy.* This section examined the strategic alignment of the information technology used in the company. The selected indicators measure the company objectives for the digital transformation of key business processes (Ko *et al.*, 2022; Wang *et al.*, 2020).

*4.2.4 Management support.* The analysis measured the commitment of company management to technological innovation with three indicators (TMS1, TMS2 and TMS3). The objective was to measure a latent variable that indicates the interest of management in making a strategic change in the organization's operations by using digitization (Ko *et al.*, 2022). These measurement instruments assess whether the knowledge-oriented leadership perceives and effectively exploits innovation opportunities (Singh *et al.*, 2021). A transformational leader who is dedicated to promoting the capacity for innovation in the organization can achieve this goal (Le and Lei, 2019).

*4.2.5 Company performance.* Organizational performance is the key dependent variable. It was measured subjectively as this is considered a valid proxy for objective measures (Tajeddini and Ratten, 2017). Its indicators reflect the perceptions of the administrative managers in the interviews with the questions about how effectively the companies will achieve their long-term goals. The questionnaire included questions about the managers' opinions of the performance of their company compared to the main competitors in the last three years using items adapted from the research by Rehman and Anwar (2019) and Wang *et al.* (2020).

## 5. Analysis and results

The research model was analyzed using empirical validation with partial least squares structural equations (PLS-SEM). This data analysis technique uses variance to test the model (Henseler *et al.*, 2016).

The rationale behind the use of PLS is that all variables in the model are composite (Rigdon *et al.*, 2017) and the objective was to investigate relationships between directly latent variables which act as constructs measured by the indicators (Hair *et al.*, 2019b). PLS-SEM analysis uses confirmatory research in order to understand the causal relationships between variables. It involves hypothesis testing of a particular research model maximizing the explained variance of the dependent variable and calculating the model fit indices (Henseler, 2018).

Researchers in the social sciences fields of Management (Velicia-Martin *et al.*, 2021), Information Systems (Palos-Sanchez *et al.*, 2017b), eco-friendliness (Sánchez *et al.*, 2021), Hospitality (Hernandez-Rojas *et al.*, 2021), apps (Palos-Sanchez *et al.*, 2019b), m-Commerce (Velicia-Martin *et al.*, 2022) and m-Health (Palos-Sanchez *et al.*, 2021) use this type of analysis method.

The researchers used a two-phase PLS-SEM analysis to evaluate the causal model, firstly by evaluating the measurement model (external model) and secondly by evaluating the structural model (internal model) (Hair *et al.*, 2019b). This sequence ensures reliable and valid proxy measurements, which is a necessary condition when drawing conclusions about the relationships between the constructs (Roldán and Sánchez-Franco, 2012).

The researchers used the SmartPLS version 3.3.6 software package to analyze the data (Ringle *et al.*, 2015). The PLS algorithm minimizes the residual variances of the dependent variables (Chin, 1998). The next step was a bootstrapping procedure to test the statistical significance of several of the PLS-SEM results, such as path coefficients, Cronbach's alpha, HTMT and  $R^2$  values. The final stage was blindfolding which is a sample reuse technique to try to estimate the predictive relevance of the reflective dependent constructs (Chin, 1998).

### 5.1 Evaluation of the measurement model

The research model uses a B-mode composite construct (formative) and four A-mode composite constructs (reflective). The first results shown in the evaluation of the measurement model are the results of the estimation variable in formative mode. The next step of the research was a variance inflation factor (VIF) collinearity test based on the work by Diamantopoulos and Sigauw (2006). The result was higher than 3.3, which indicates possible multicollinearity problems. The present model had a maximum VIF of 3 with the rest of the indicators scoring well below this amount. This indicates that the model used does not have multicollinearity problems (see Table A4).

The Weights of the most relevant indicators of the digital competence training composite construct give information about the relative contribution to the construct of each indicator, and loading establishes the correlation between the indicator and its construct (see Table A4). The value of this measurement must have a significance level of at least 0.05 to be relevant, which is a necessary requirement and the bootstrapping process of resampling 5,000 samples must have  $p$ -values  $< 0.05$  (Hair *et al.*, 2019b). Although there are four non-significant indicators (CD1, RA2, TR1 and TR2) that contribute little to the explained variance, the measurement model must include them because eliminating them would reduce the value of the explanation of the construct. Only two indicators of the construct (CP1, RA3) were removed because of high multicollinearity (Roberts and Thatcher, 2009).

The analysis method of composite A-mode (reflective) constructs by Hair *et al.* (2019a). Provided the results for reliability and validity. This assessment of reliability and validity is not applicable to formative measures as they do not have to be correlated and are assumed to be error-free (Bagozzi, 1994). The individual reliability was sufficient as all the indicators of the constructs have external loadings ( $\lambda$ ) greater than 0.707. Three items of the digital strategy construct (PLAN2, PLAN3 and PLAN7) and four items of organizational performance (BEN1, BEN3, BEN7 and BEN10) had loadings below 0.7 and were

eliminated. The second step was to examine the reliability of the constructs. The analysis found the values of Cronbach's alpha, composite reliability and (rho-A) for the indices, all of them having values above 0.8, which means that the constructs have high internal consistency (Table 1). The next stage was to find the validity of the indicators with respect to the construct by calculating the value of the average variance extracted (AVE), which must exceed the threshold of 0.5 for convergent validity (see Table 1). The conclusion was that all constructs have discriminant validity, since the conditions for correlation criterion explained by Fornell and Larcker (1981) and the heterotrait-monotrait (HTMT) indicators (Henseler et al., 2015) are met. The results are shown in Table 2.

### 5.2 Evaluation of the structural model

The objective was to analyze the relationships of the unobservable variables. The PLS-SEM algorithm does this by maximizing the explained variance of the dependent variables or minimizing the residual variances, which are the error factors of each one.

The first calculation found the collinearity of the exogenous latent constructs with the endogenous latent variables. All the variables of the model have a VIF lower than 3, so there are no multicollinearity problems as they do not exceed the threshold suggested by Hair et al. (2019a). The next stage evaluated the algebraic sign, the size (see Figure 2) and the significance of the path coefficients. The final step used the indications of Hair et al. (2019b) to make a bootstrapping technique with 5,000 resamples to find the standard errors, confidence intervals and *t*-values (*t*-statistics) which were then used to evaluate the statistical

Constructs	Cronbach's alpha	Rho-A*	Composite reliability	AVE
Management support	0.830	0.834	0.898	0.746
Digital strategy	0.921	0.924	0.937	0.680
Organizational performance	0.934	0.936	0.946	0.685
Digital cloud technology	0.854	0.861	0.912	0.775

**Table 1.**  
Construct reliability  
and convergent  
validity

**Note(s):** \*Dijkstra-Henseler (pA) → Rho-A

**Source(s):** Authors own

Constructs	Management support	Digital capability	Digital strategy	Organizational performance	Digital cloud technology
<b>Fornell and Larcker</b>					
<i>HTMT (Heterotrait-Monotrait)</i>					
Management support	<i>0.864</i>		0.495	0.634	0.334
Digital capability	0.568	<i>n.a.</i>		0.740	0.307
Digital strategy	0.437	0.627	<i>0.824</i>		0.333
Organizational performance	0.563	0.769	0.688	<i>0.828</i>	
Digital cloud technology	0.284	0.348	0.272	0.299	<i>0.880</i>

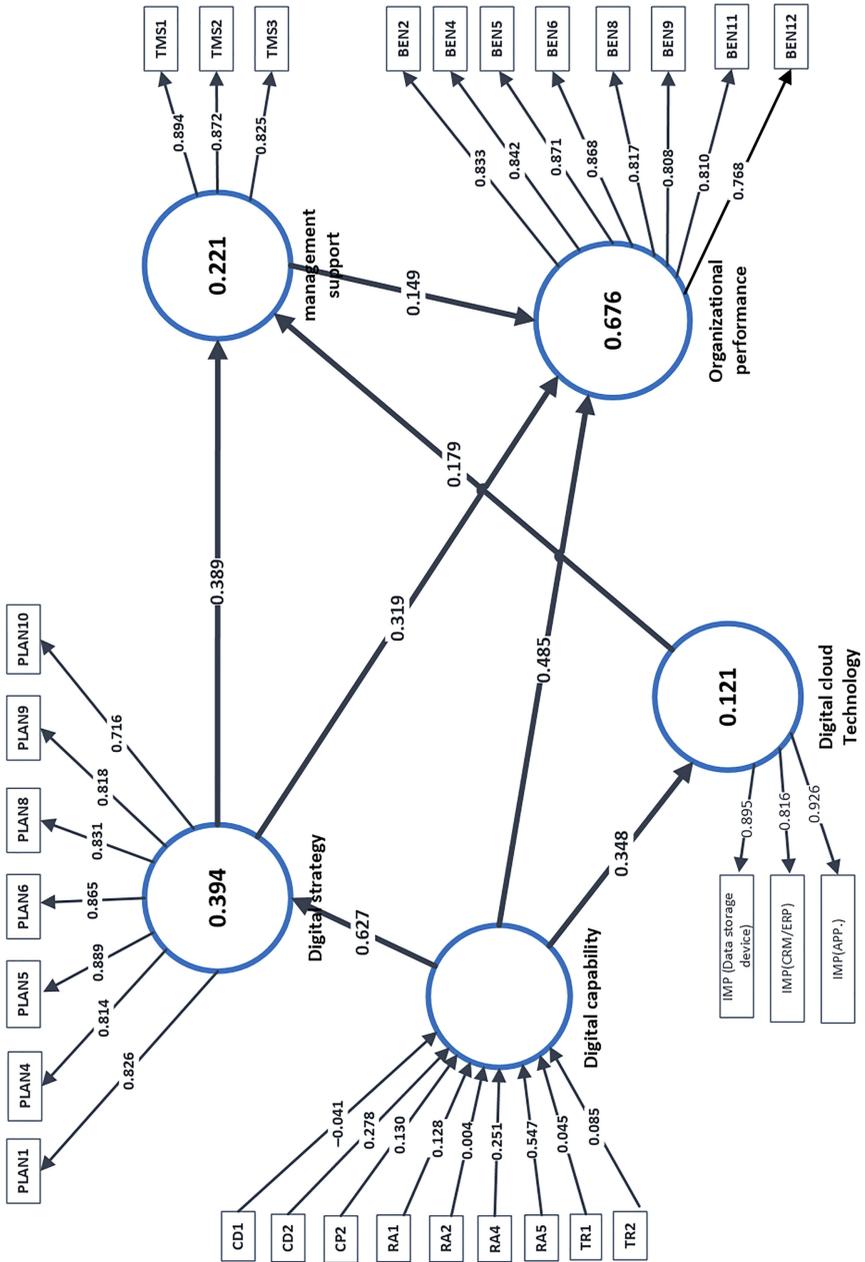
**Note(s):** Fornell and Larcker: The values shown on the diagonal elements in italic are the square roots of the AVE and are higher than the values outside the diagonal, which correspond to their correlations with the rest of the constructs, For satisfactory discriminant validity according to Fornell and Larcker (1981)

HTMT < *a* 0.85 all its elements present discriminant validity (Henseler et al., 2015)

n.a. → non-availability

**Source(s):** Authors own

**Table 2.**  
Discriminant validity



Source(s): Authors own

Figure 2.  
Estimation model

significance of the hypothesized relationships (see Table 3). The Bootstrap test shows that all seven relationships in the model are significant and supported.

The values of  $R^2$  indicate the variance explained of the dependent variable by the predictor variables (see Table 4). The endogenous variable “organizational performance” has an  $R^2$  value of 67.63%, which shows the variance explained by three antecedent constructs (management support, 8.39%, digital capability, 37.30% and digital strategy, 21.95%). The  $R^2$  values show a reasonable predictive significance for all the variables analyzed as they exceed the minimum threshold of 0.1 (Falk and Miller, 1992) with the dependent variable “organizational performance” having the highest predictive ability with a value of 0.6763 (Chin, 1998).

The predictive qualities of the model were evaluated last. Identifying the structural paths and statistically testing them found the predictive power of the out-of-sample structural paths (Danks et al., 2019). Using the indications of (Shmueli et al., 2019) the researchers could find the predictive power of the dependent variable Organizational Performance using SmartPLS version 3.3.6 software with the PLS-predictive option. The results are shown in Table 5.

The model in this study has a high predictive power since all the  $Q^2$  indicators have positive values. The dependent variable Organizational Performance has a medium level of predictive power because the indicators that explain this construct show a highly predictive power, as seen for BEN2, BEN4, BEN8, BEN8, BEN11 and BEN12. This means that they are very useful in this model for their ability to explain new and unstudied data (Gregor, 2006). These results are effective in decision making (Shmueli et al., 2019), which, in this case, is for the management of KIBS companies using the selected DT components to generate improved organizational performance.

Relationships	Path coefficient	Confidence interval		p-value
		5% lower	95% upper	
Management support → Organizational performance	0.149** (2.517)	0.054	0.247	0.006
Digital capability → Digital strategy	0.627*** (13.762)	0.530	0.688	0.000
Digital capability → Organizational performance	0.485*** (7.807)	0.379	0.585	0.000
Digital capability → Digital cloud technology	0.348*** (6.182)	0.241	0.429	0.000
Digital strategy → Management support	0.389*** (6.658)	0.284	0.477	0.000
Digital strategy → Organizational performance	0.319*** (4.218)	0.202	0.451	0.000
Digital cloud technology → Management support	0.179*** (3.105)	0.080	0.271	0.001

**Note(s):**  $t$  values in parentheses:  $t(0.05, 4,999) = 1.645$ ;  $t(0.01, 4,999) = 2.327$ ;  $t(0.001, 4,999) = 3.092$

\* $p < 0.05$ ; \*\* $p < 0.01$ , \*\*\* $p < 0.001$ . All hypotheses are significant

Confidence Interval to the 90%, there is no change of sign and therefore the hypotheses are supported

**Source(s):** Authors own

**Table 3.**  
Structural model  
results

Hypotheses	Path coefficient	Correlation of indicators	$R^2$
Management support → Organizational performance	0.149	0.563	0.0839
Digital capability → Organizational performance	0.485	0.769	0.3730
Digital strategy → Organizational performance	0.319	0.688	0.2195
<b><math>R^2</math> for the dependent construct “Organizational performance”</b>			<b>0.6763</b>

**Source(s):** Authors own

**Table 4.**  
 $R^2$  decomposition of  
the construct  
“Organizational  
performance”

Indicator	RMSE	PLS_SEM * $Q^2$ predict	LM RMSE	PLS_SEM-LM RMSE
[BEN2: Access to new markets]	0.808	0.321	0.815	-0.007 <sup>a</sup>
[BEN4: Improved communication]	0.679	0.406	0.682	-0.003 <sup>a</sup>
[BEN5: New business lines]	0.750	0.409	0.745	0.005 <sup>b</sup>
[BEN6: More productivity]	0.678	0.505	0.638	0.040 <sup>b</sup>
[BEN8: New customers]	0.831	0.368	0.833	-0.002 <sup>a</sup>
[BEN9: Time optimization]	0.714	0.417	0.712	0.002 <sup>b</sup>
[BEN11: Effectiveness decisions]	0.781	0.348	0.787	-0.006 <sup>a</sup>
[BEN12: Employee satisfaction]	0.778	0.287	0.781	-0.003 <sup>a</sup>

**Note(s):** 1. \* $Q^2$  predict >0; all the indicators of the model studied have a  $Q^2 > 0$   
 2. RMSE: All values < 1 are symmetric according to [Hair et al. \(2021\)](#)  
 3. LM: shows the predictive capabilities of the indicators  
 4. PLS\_SEM-LM<0 The results referenced with “a” should have a lower prediction error, In comparison with the LM outcomes  
 5. For  $n = 500$  subsamples based on distribution  $t$  (499) of one-tagged student: \* $p < 0.05$  ( $t$  (0.05, 499) = 1.64791345); \*\* $p < 0.01$  ( $t$  (0.01, 499) = 2.333843952); \*\*\* $p < 0.001$  ( $t$  (0.001, 499) = 3.106644601)

**Table 5.**  
Indicator prediction summary

## 6. Discussion

### 6.1 Comparison with the scientific literature

This study examines how the components of DT affect organizational performance. Researchers used the resource and capability theory to test a theoretical framework explaining the effects of DT in the companies comprising the KIBS professional services sector using 335 interviews with Spanish administrative managers. The proposed model shows that there are different factors affecting the company DT. Digital capability is an important source of resources (cloud technology), skills and digital knowledge that can be integrated into the company to improve business processes and results.

The scientific literature includes previous studies of digital capability at an organizational level with the positive effect of digital capability in creating and fostering company performance shown in the study by [Nwankpa and Roumani \(2016\)](#). In this case, digital capability was one of the driving forces of DT, although the direct impact of IT capability on performance may become less and less relevant over time. The study by [Nwankpa and Datta \(2017\)](#) uses the same approach recognizing the importance of digital capability on organizational performance with provided Digital Business Intensity moderating it, as organizational performance cannot be defined simply by the ability to effectively exploit IT resources and assets. Other authors such as [Khin and Ho \(2019\)](#) focus on technological innovation as a necessary construct to generate higher organizational performance and improving the ability to manage digital technology generates innovative digital solutions which indirectly affect organizational performance. [Troise et al. \(2022\)](#) considers IT capacity as a relevant precursor of organizational agility in the company, which has an indirect relevance on the improvement of the performance of organizations.

The strong influence that digital capability has on the evolution of the digital strategy of the company is a determining element of the model in this study showing that the new information technologies existing in the market must be used and exploited. Other findings also highlight the importance of changes generated by digital technologies in the strategic digital orientation of companies ([Rupeika-Apoga et al., 2022](#)). Technological changes cause changes in the ways a company creates added value ([Becker and Schmid, 2020](#)), improves customer service, increases customer loyalty and increases market share. These elements of digital strategy help explain the improvement in organizational performance. The study by [Wang et al. \(2020\)](#) includes the same variables and shows that an improvement in the IT

strategy of a company allows digital business strategies to be effective in increasing the performance of companies. Sousa-Zomer *et al.* (2020) shows that the capacity of digital transformation, considered as the ability of a company to execute a digital strategy, helps to directly explain the heterogeneity of an organization's performance.

Another component considered as a necessary factor for the success of DT, which has a direct relationship with organizational performance in the model proposed in this study, is the commitment of management to technological innovation determined by strategic objectives (Ko *et al.*, 2022). The management of KIBS companies should promote transformational leadership as it is the most effective way to stimulate knowledge sharing and innovative behavior (Bednall *et al.*, 2018). Managers play an important role in the development of business resources and capabilities, with different organizational results resulting from the appropriate combination of them (Badrinarayanan *et al.*, 2019) and the importance of management decisions in influencing company restructuring can be seen in the research by (Khin and Ho, 2019). Leadership is an essential requirement of managerial action to achieve DT.

Previous studies of KIBS companies have analyzed the positive effect of IT use and digital management practices on business performance (Horváth and Szerb, 2018). Ribeiro-Navarrete *et al.* (2021) extended this study of KIBS to include digital tools and found that keeping social networks updated, along with intensive corporate use, has a positive impact on company performance.

### 6.2 Theoretical and practical implications

The present study expands on the results of previous research work and validates the theoretical arguments with fully supported hypotheses. To do this (Teng *et al.*, 2022), made a detailed analysis of digital technology as the main component of DT. In this study, the most relevant aspect found was the ability to select and integrate the most relevant digital technologies for the company from the wide variety that exists and then adapt them to the business of individual KIBS companies.

The aim is to create new processes and products to respond to the changing needs of the market. Cloud computing is the main digital technology that these types of organizations choose using their professional knowledge and experience of a technical or functional domain (Palos-Sanchez *et al.*, 2019a). The process is a digital capability or IT capability. This is the most relevant construct in the model and is considered the main explanatory variable. It infers the technological tools to implement and the approach to follow in order to develop an adequate digital strategy that improves the internal and external processes of the company. These include the use of technology (with new customer and data management software – ERP, CRM and professional management applications), the nature of the organizational structure (by decentralizing decisions and improving production efficiency with flatter and more flexible hierarchies) and value creation (with the implementation of the appropriate IT tools that create services which meet the changing needs of customers, increase customer loyalty and increase market share). It has been empirically proven that, in order to carry out the aforementioned disruptive process, the company management must promote a digital culture that supports the development of digital strategies and also perform transformational leadership functions as they must know how to transmit and stimulate the exchange of knowledge and innovative behavior to all employees of the organization.

This article contributes to the existing literature on DT, especially the research concerned with digital capability and technological innovation. It emphasizes the importance of knowledge and development of the functions of IT tools so that existing resources and infrastructures are exploited to perform stable operations. IT must also be proactive and flexible in order to exploit new opportunities and apply new ideas to existing structures.

This study advances the knowledge for the current debate on the role of digital capability in organizational performance. If the integration of digital technologies in KIBS companies is carried out efficiently, digital capability is the variable that contributes most directly to increasing organizational performance.

This research has implications for managers of KIBS companies, as it shows the high potential of the ability of IT to implement and manage a DT process. Managers can benefit from IT management practices using the appropriate tools (ERP, CRM and management software) to gain more knowledge of customer behavior with the possibility of easily codifying and analyzing the data, which significantly influences innovation activities. The objective is to develop a strong internal capability to absorb knowledge from day-to-day interactions with customers by using IT effectively. This process leads to an improvement in the organizational performance of KIBS companies, as they become more effective in decision making with improved internal communication, generate greater employee satisfaction and reach new customers.

Moreover, implementing management strategies based on the adoption and use of technology will help companies in the new digital economy to close the production gap between SMEs and large companies by increasing their capacity and ability for innovation (Abu Hasan *et al.*, 2022). These innovative processes create agile SMEs, with low-hierarchical and non-rigid structures, with managers open to innovation (Chan *et al.*, 2019). If KIBS companies can achieve this level of agility in their organizations, they will be able to achieve higher profit margins compared to larger companies that have higher costs for the implemented innovative processes, because they have more complex, heavy and decentralized organizational structures (Neirotti *et al.*, 2017).

The practical implications are also useful for policy makers since DT does not start by itself in the economic sector under study. The study shows the most relevant factors that trigger this process. The most important factor is the digital capability to adopt certain tools to implement DT, which favors organizational performance and has practical value for policy makers. These results can be applied to plan a DT process for SMEs in the professional services sector by enhancing the creation of more sustainable enterprises with cloud computing. The results of the study provide an insight into the processes that policy makers can implement to help SMEs become more competitive and sustainable. Creative solutions are provided for the strengthening and sophistication of SME business models in the service sector studied.

## 7. Conclusions

This paper analyzes the challenge of implementing DT in KIBS companies with a combination of two factors. The first is the adequate management of existing resources and the second is interconnecting and ordering digital capabilities. To do this, companies must investigate the existing technologies in the market and select those which are useful and implement them. The goal is to create new products and processes by using appropriate strategies and with a managerial style that encourages these changes to obtain optimal organizational performance.

KIBS companies that incorporate DT are able to align digital insights about customers with processes and technological investments that result in a strong internal capability to absorb insights from day-to-day interactions with customers and improve the customers' experience.

This study enriches the existing literature on KIBS companies because many researchers have analyzed innovation capability with customer-company knowledge sharing as one of the main functions and in this research the ability to innovate is considered as the knowledge and use of digital technologies.

Future research should continue to analyze other components of DT that drive the organizational performance of KIBS firms, such as technological culture or government policies that encourage digital transactions. The present study analyzes data from companies that are part of a single economic sector in Spain which may limit the conclusions drawn. It would be particularly useful to confirm the applicability of the results in companies operating in different markets to explore the direct relationship between digital capability and organizational performance.

## References

- Abarca, V.M.G., Palos-Sanchez, P.R. and Rus-Arias, E. (2020), "Working in virtual teams: a systematic literature review and a bibliometric analysis", *IEEE Access*, Vol. 8, pp. 168923-168940, doi: [10.1109/ACCESS.2020.3023546](https://doi.org/10.1109/ACCESS.2020.3023546).
- Abdolvand, N., Albadvi, A. and Ferdowsi, Z. (2008), "Assessing readiness for business process reengineering", *Business Process Management Journal*, Vol. 14 No. 4, pp. 497-511, doi: [10.1108/14637150810888046](https://doi.org/10.1108/14637150810888046).
- Abu Hasan, N., Abd Rahim, M., Ahmad, S.H. and Meliza, M. (2022), "Digitization of business for small and medium-sized enterprises (SMEs)", *Environment-Behaviour Proceedings Journal*, Vol. 7 No. 19, pp. 11-16, doi: [10.21834/ebpj.v7i19.3270](https://doi.org/10.21834/ebpj.v7i19.3270).
- Agarwal, R. and Helfat, C.E. (2009), "Strategic renewal of organizations", *Organization Science*, Vol. 20 No. 2, pp. 281-293, doi: [10.1287/orsc.1090.0423](https://doi.org/10.1287/orsc.1090.0423).
- Agarwal, R., Gao, G.G., DesRoches, C. and Jha, A.K. (2010), "Research commentary—the digital transformation of healthcare: current status and the road ahead", *Information Systems Research*, Vol. 21 No. 4, pp. 796-809, doi: [10.1287/isre.1100.0327](https://doi.org/10.1287/isre.1100.0327).
- Akkermans, H. and van Helden, K. (2002), "Vicious and virtuous cycles in ERP implementation: a case study of interrelations between critical success factors", *European Journal of Information Systems*, Vol. 11 No. 1, pp. 35-46, doi: [10.1057/palgrave.ejis.3000418](https://doi.org/10.1057/palgrave.ejis.3000418).
- Al-Mudimigh, A., Zairi, M. and Al-Mashari, M. (2001), "ERP software implementation: an integrative framework", *European Journal of Information Systems*, Vol. 10 No. 4, pp. 216-226, doi: [10.1057/palgrave.ejis.3000406](https://doi.org/10.1057/palgrave.ejis.3000406).
- Alhaqabani, A., Reed, D.M., Savage, B.M. and Ries, J. (2016), "The impact of middle management commitment on improvement initiatives in public organisations", *Business Process Management Journal*, Vol. 22 No. 5, pp. 924-938, doi: [10.1108/BPMJ-01-2016-0018](https://doi.org/10.1108/BPMJ-01-2016-0018).
- Alhathal, F.T., Sharma, P. and Kingshott, R.P.J. (2019), "Moderating effects of service separation on customer relationships with service firms: a social-exchange perspective", *Journal of Service Theory and Practice*, Vol. 29 No. 1, pp. 71-92, doi: [10.1108/JSTP-09-2017-0149](https://doi.org/10.1108/JSTP-09-2017-0149).
- Ali, F., Rasoolimanesh, S.M., Sarstedt, M., Ringle, C.M. and Ryu, K. (2018), "An assessment of the use of partial least squares structural equation modeling (PLS-SEM) in hospitality research", *International Journal of Contemporary Hospitality Management*, Vol. 30 No. 1, pp. 514-538, doi: [10.1108/IJCHM-10-2016-0568](https://doi.org/10.1108/IJCHM-10-2016-0568).
- AlMujaini, H., Hilmi, M.F., Abudaqa, A. and Alzahmi, R. (2021), "Corporate foresight organizational learning and performance: the moderating role of digital transformation and mediating role of innovativeness in SMEs", *International Journal of Data and Network Science*, Vol. 5 No. 4, pp. 703-712, doi: [10.5267/j.ijdns.2021.7.011](https://doi.org/10.5267/j.ijdns.2021.7.011).
- AlMulhim, A.F. (2021), "Smart supply chain and firm performance: the role of digital technologies", *Business Process Management Journal*, Vol. 27 No. 5, pp. 1353-1372, doi: [10.1108/BPMJ-12-2020-0573](https://doi.org/10.1108/BPMJ-12-2020-0573).
- Andrade, C. (2021), "The inconvenient truth about convenience and purposive samples", *Indian Journal of Psychological Medicine*, Vol. 43 No. 1, pp. 86-88, doi: [10.1177/0253717620977000](https://doi.org/10.1177/0253717620977000).
- Babbie, E.R. (2007), *The Practice of Social Research*, University Library, Istanbul Bilgi.

- Badrinarayanan, V., Ramachandran, I. and Madhavaram, S. (2019), "Resource orchestration and dynamic managerial capabilities: focusing on sales managers as effective resource orchestrators", *Journal of Personal Selling and Sales Management*, Vol. 39 No. 1, pp. 23-41, doi: [10.1080/08853134.2018.1466308](https://doi.org/10.1080/08853134.2018.1466308).
- Bagozzi, R. (1994), *Structural Equation Models in Marketing Research: Basic Principles (Principles of Marketing Research)*, Blackwell, Oxford.
- Bass, B.M. (1990), "From transactional transformational leadership: learning to share the vision", *Organizational Dynamics*, Vol. 18 No. 3, pp. 19-31, doi: [10.1016/0090-2616\(90\)90061-S](https://doi.org/10.1016/0090-2616(90)90061-S).
- Becker, W. and Schmid, O. (2020), "The right digital strategy for your business: an empirical analysis of the design and implementation of digital strategies in SMEs and LSEs", *Business Research*, Vol. 13 No. 3, pp. 985-1005, doi: [10.1007/s40685-020-00124-y](https://doi.org/10.1007/s40685-020-00124-y).
- Bednall, T.C., Rafferty, E.A., Shipton, H., Sanders, K. and Jackson, J.C. (2018), "Innovative behaviour: how much transformational leadership do you need?", *British Journal of Management*, Vol. 29 No. 4, pp. 796-816, doi: [10.1111/1467-8551.12275](https://doi.org/10.1111/1467-8551.12275).
- Benešová, D., Kubíčková, V. and Prváková, M. (2020), "Open innovation model in the knowledge intensive business services in the Slovak Republic", *Entrepreneurship and Sustainability Issues*, Vol. 8 No. 2, pp. 1340-1358, doi: [10.9770/jesi.2020.8.2\(79\)](https://doi.org/10.9770/jesi.2020.8.2(79)).
- Benlian, A. and Haffke, I. (2016), "Does mutuality matter? Examining the bilateral nature and effects of CEO-CIO mutual understanding", *The Journal of Strategic Information Systems*, Vol. 25 No. 2, pp. 104-126, doi: [10.1016/j.jsis.2016.01.001](https://doi.org/10.1016/j.jsis.2016.01.001).
- Berghaus, S. and Back, A. (2016), "Stages in digital business transformation: results of an empirical maturity study", *MCIS 2016 Proceedings*, Vol. 22, p. 18.
- Bharadwaj, A.S. (2000), "A resource-based perspective on information technology capability and firm performance: an empirical investigation", *MIS Quarterly*, Vol. 24 No. 1, pp. 169-196, doi: [10.2307/3250983](https://doi.org/10.2307/3250983).
- Bharadwaj, A., El Sawy, O.A., Pavlou, P.A. and Venkatraman, N. (2013), "Digital business strategy: toward a next generation of insights", *MIS Quarterly*, Vol. 37 No. 2, pp. 471-482, doi: [10.25300/MISQ/2013/37:2.3](https://doi.org/10.25300/MISQ/2013/37:2.3).
- Birasnav, M., Rangnekar, S. and Dalpati, A. (2011), "Transformational leadership and human capital benefits: the role of knowledge management", *Leadership and Organization Development Journal*, Vol. 32 No. 2, pp. 106-126, doi: [10.1108/01437731111112962](https://doi.org/10.1108/01437731111112962).
- Bouwman, H., Nikou, S. and de Reuver, M. (2019), "Digitalization, business models, and SMEs: How do business model innovation practices improve performance of digitalizing SMEs?", *Telecommunications Policy*, Vol. 43 No. 9, 101828.
- Braun, S., Peus, C., Weisweiler, S. and Frey, D. (2013), "Transformational leadership, job satisfaction, and team performance: a multilevel mediation model of trust", *The Leadership Quarterly*, Vol. 24 No. 1, pp. 270-283, doi: [10.1016/j.leaqua.2012.11.006](https://doi.org/10.1016/j.leaqua.2012.11.006).
- Breunig, K.J. and Skjolsvig, T. (2017), "Digitization-effects and the legal industry: emerging business models", *Oslo and Akershus University College of Applied Sciences*, available at: [https://oda-hioa.archive.knowledgearc.net/bitstream/handle/10642/5814/ID325\\_Breunig\\_%26\\_Skjolsvik\\_Business%2bmodels\\_IFKAD.pdf?sequence=1&isAllowed=y](https://oda-hioa.archive.knowledgearc.net/bitstream/handle/10642/5814/ID325_Breunig_%26_Skjolsvik_Business%2bmodels_IFKAD.pdf?sequence=1&isAllowed=y) (accessed October 2019).
- Brynjolfsson, E. and Mcfee, A. (2014), *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*, WW Norton & Company, New York City.
- Cania, L. (2014), "The impact of strategic human resource management on organizational performance", *Economia. Seria Management*, Vol. 17, pp. 373-383.
- Chan, C.M.L., Teoh, S.Y., Yeow, A. and Pan, G. (2019), "Agility in responding to disruptive digital innovation: case study of an SME", *Information Systems Journal*, Vol. 29 No. 2, pp. 436-455, doi: [10.1111/isj.12215](https://doi.org/10.1111/isj.12215).

- Chi, M., Zhao, J. and Li, Y. (2016), "Digital business strategy and firm performance: the mediation effects of E-collaboration capability", in Tu, Y.P. (Ed), *Fifteenth Wuhan International Conference on E-Business*, Alfred Univ, pp. 86-97.
- Chin, W.W. (1998), "The partial least squares approach to structural equation modeling", in Marcoulides, G.A. (Ed.), *Modern Methods for Business Research*, Erlbaum, Mahwah, pp. 295-358.
- Chung, T.-A. and Tseng, C.-Y. (2019), "The knowledge intensity and the economic performance in Taiwan's knowledge intensity business services", *Economic Research-Ekonomika Istraživanja*, Vol. 32 No. 1, pp. 797-811, doi: [10.1080/1331677X.2019.1583586](https://doi.org/10.1080/1331677X.2019.1583586).
- Cole, R.E., Bacdayan, P. and White, B.J. (1993), "Quality, participation, and competitiveness", *California Management Review*, Vol. 35 No. 3, pp. 68-81, doi: [10.2307/41166744](https://doi.org/10.2307/41166744).
- Concha, C.E.S., Marino, C.M. and Rodriguez, J.C. (2018), "E-commerce in Chile: what factors affect the purchase decision?", *Revista Academia and Negocios*, Vol. 4 No. 1, pp. 1-14, available at: <http://ran.udec.cl/ojs/index.php/ran/article/view/64>
- Consoli, D., Elche, D. and Rullani, F. (2015), "Employment and skill configurations in KIBS sectors: a longitudinal analysis", in Agarwal, R., Selen, W., Roos, G. and Green, R. (Eds), *The Handbook of Service Innovation*, Springer, pp. 213-235, doi: [10.1007/978-1-4471-6590-3\\_11](https://doi.org/10.1007/978-1-4471-6590-3_11).
- Contractor, A.A., Frankfurt, S.B., Weiss, N.H. and Elhai, J.D. (2017), "Latent-level relations between DSM-5 PTSD symptom clusters and problematic smartphone use", *Computers in Human Behavior*, Vol. 72, pp. 170-177, doi: [10.1016/j.chb.2017.02.051](https://doi.org/10.1016/j.chb.2017.02.051).
- Danks, N.P., Ray, S. and Shmueli, G. (2019), "Predictive analysis and out-of-sample generalizability of construct-based models", *Proceedings of the 2019 Pre-ICIS SIGDSA Symposium*, Paper 23, available at: <https://aisel.laisnet.org/sigdsa2019/23>
- Diamantopoulos, A. and Siguaw, J.A. (2006), "Formative versus reflective indicators in organizational measure development: a comparison and empirical illustration", *British Journal of Management*, Vol. 17 No. 4, pp. 263-282, doi: [10.1111/j.1467-8551.2006.00500.x](https://doi.org/10.1111/j.1467-8551.2006.00500.x).
- Du, W., Pan, S.L. and Huang, J. (2016), "How a latecomer company used IT to redeploy slack resources", *Mis Quarterly Executive*, Vol. 15 No. 3, pp. 195-213, available at: <https://www.webofscience.com/wos/alldb/full-record/WOS:000391204700003>
- Eklöf, J., Podkorytova, O. and Malova, A. (2020), "Linking customer satisfaction with financial performance: an empirical study of Scandinavian banks", *Total Quality Management and Business Excellence*, Vol. 31 Nos 15-16, pp. 1684-1702, doi: [10.1080/14783363.2018.1504621](https://doi.org/10.1080/14783363.2018.1504621).
- Evans, G.L. (2017), "Disruptive technology and the board: the tip of the iceberg", *Economics and Business Review*, Vol. 3 No. 17 (1), pp. 205-223, doi: [10.18559/ebr.2017.1.11](https://doi.org/10.18559/ebr.2017.1.11).
- Fachrunnisa, O., Adhiatma, A., Lukman, N. and Majid, M.N.A. (2020), "Towards SMEs' digital transformation: the role of agile leadership and strategic flexibility", *Journal of Small Business Strategy*, Scopus, Vol. 30 No. 3, pp. 65-85.
- Falk, R.F. and Miller, N.B. (1992), *A Primer for Soft Modeling*, The University of Akron, Akron, Ohio.
- Folgado-Fernandez, J.A., Palos-Sanchez, P.R. and Camacho, M.A. (2020), "Motivaciones, formación y planificación del trabajo en equipo para entornos de aprendizaje virtual - proquest", *Interciencia*, Vol. 45 No. 2, pp. 102-109, available at: <https://www.proquest.com/openview/bfca1c9f401522fe82af8b22fa72f6a8/1?pq-origsite=gscholar&cbl=27688>
- Fornell, C. and Larcker, D.F. (1981), "Evaluating structural equation models with unobservable variables and measurement error", *Journal of Marketing Research*, Vol. 18 No. 1, pp. 39-50, doi: [10.1177/002224378101800104](https://doi.org/10.1177/002224378101800104).
- Gallouj, F. and Savona, M. (2008), "Innovation in services: a review of the debate and a research agenda", *Journal of Evolutionary Economics*, Vol. 19 No. 2, p. 149, doi: [10.1007/s00191-008-0126-4](https://doi.org/10.1007/s00191-008-0126-4).
- García-Morales, V.J., Jiménez-Barrionuevo, M.M. and Gutiérrez-Gutiérrez, L. (2012), "Transformational leadership influence on organizational performance through organizational learning and

- innovation”, *Journal of Business Research*, Vol. 65 No. 7, pp. 1040-1050, doi: [10.1016/j.jbusres.2011.03.005](https://doi.org/10.1016/j.jbusres.2011.03.005).
- Garro-Abarca, V., Palos-Sanchez, P.R. and Aguayo-Camacho, M. (2021), “Virtual teams in times of pandemic: factors that influence performance | EndNote click”, *Frontiers in Psychology*, Vol. 12, pp. 1-14, doi: [10.3389/fpsyg.2021.62463](https://doi.org/10.3389/fpsyg.2021.62463).
- Goswami, M. and Kumar, G. (2018), “An investigation of agile manufacturing enablers in Indian automotive SMEs using structural equation model”, *Measuring Business Excellence*, Vol. 22 No. 3, pp. 276-291, doi: [10.1108/MBE-10-2017-0068](https://doi.org/10.1108/MBE-10-2017-0068).
- Gregor (2006), “The nature of theory in information systems”, *MIS Quarterly*, Vol. 30 No. 3, p. 611, doi: [10.2307/25148742](https://doi.org/10.2307/25148742).
- Gu, J.-W. and Jung, H.-W. (2013), “The effects of IS resources, capabilities, and qualities on organizational performance: an integrated approach”, *Information and Management*, Vol. 50 No. 2, pp. 87-97, doi: [10.1016/j.im.2013.02.001](https://doi.org/10.1016/j.im.2013.02.001).
- Hair, J.F., Astrachan, C.B., Moisescu, O.I., Radomir, L., Sarstedt, M., Vaithilingam, S. and Ringle, C.M. (2021), “Executing and interpreting applications of PLS-SEM: updates for family business researchers”, *Journal of Family Business Strategy*, Vol. 12 No. 3, 100392.
- Hair, J.F., Risher, J.J., Sarstedt, M. and Ringle, C.M. (2019a), “When to use and how to report the results of PLS-SEM”, *European Business Review*, Vol. 31 No. 1, pp. 2-24, doi: [10.1108/EBR-11-2018-0203](https://doi.org/10.1108/EBR-11-2018-0203).
- Hair, J.F., Sarstedt, M. and Ringle, C.M. (2019b), “Rethinking some of the rethinking of partial least squares”, *European Journal of Marketing*, Vol. 53 No. 4, pp. 566-584, doi: [10.1108/EJM-10-2018-0665](https://doi.org/10.1108/EJM-10-2018-0665).
- Hansen, A.M., Kraemmergaard, P. and Mathiassen, L. (2011), “Rapid adaptation in digital transformation: a participatory process for engaging IS and business leaders”, *MIS Quarterly Executive*, Vol. 10 No. 4, pp. 175-185.
- He, Z.-L. and Wong, P.-K. (2009), “Knowledge interaction with manufacturing clients and innovation of knowledge-intensive business services firms”, *Innovation*, Vol. 11 No. 3, pp. 264-278, doi: [10.5172/impp.11.3.264](https://doi.org/10.5172/impp.11.3.264).
- Henseler, J. (2018), “Partial least squares path modeling: Quo vadis?”, *Quality and Quantity*, Vol. 52 No. 1, pp. 1-8, doi: [10.1007/s11135-018-0689-6](https://doi.org/10.1007/s11135-018-0689-6).
- Henseler, J., Ringle, C.M. and Sarstedt, M. (2015), “A new criterion for assessing discriminant validity in variance-based structural equation modeling”, *Journal of the Academy of Marketing Science*, Vol. 43 No. 1, pp. 115-135, doi: [10.1007/s11747-014-0403-8](https://doi.org/10.1007/s11747-014-0403-8).
- Henseler, J., Hubona, G. and Ray, P.A. (2016), “Using PLS path modeling in new technology research: updated guidelines”, *Industrial Management and Data Systems*, Scopus, Vol. 116 No. 1, pp. 2-20, doi: [10.1108/IMDS-09-2015-0382](https://doi.org/10.1108/IMDS-09-2015-0382).
- Hernandez-Rojas, R.D., Folgado-Fernandez, J.A. and Palos-Sanchez, P.R. (2021), “Influence of the restaurant brand and gastronomy on tourist loyalty. A study in Córdoba (Spain)”, *International Journal of Gastronomy and Food Science*, Vol. 23, 100305, doi: [10.1016/j.ijgfs.2021.100305](https://doi.org/10.1016/j.ijgfs.2021.100305).
- Holotiuk, F. and Beimborn, D. (2017), “Critical success factors of digital business strategy”, Frankfurt School of Finance & Management, Vol. 15.
- Horlacher, A. and Hess, T. (2016), “What does a Chief Digital Officer do? Managerial tasks and roles of a new C-level position in the context of digital transformation”, *2016 49th Hawaii International Conference on System Sciences (HICSS)*, pp. 5126-5135.
- Horváth, K. and Szerb, L. (2018), “Managerial practices and the productivity of knowledge-intensive service businesses: an analysis of digital/IT and cash management practices”, *Strategic Change*, Vol. 27 No. 2, pp. 161-172, doi: [10.1002/jsc.2191](https://doi.org/10.1002/jsc.2191).
- Huang, M.-H. and Rust, R.T. (2018), “Artificial intelligence in service”, *Journal of Service Research*, doi: [10.1177/1094670517752459](https://doi.org/10.1177/1094670517752459).

- 
- Huang, J., Henfridsson, O., Liu, M.J. and Newell, S. (2017), "Growing on steroids: rapidly scaling the user base of digital ventures through digital innovaton", *MIS Quarterly*, Vol. 41 No. 1.
- Jung, D., Wu, A. and Chow, C.W. (2008), "Towards understanding the direct and indirect effects of CEOs' transformational leadership on firm innovation", *The Leadership Quarterly*, Vol. 19 No. 5, pp. 582-594.
- Kahre, C., Hoffmann, D. and Ahlemann, F. (2017), "Beyond business-IT alignment - digital business strategies as a paradigmatic shift: a review and research agenda", *Hawaii International Conference on System Sciences*. doi: [10.24251/HICSS.2017.574](https://doi.org/10.24251/HICSS.2017.574).
- Karimi, J. and Walter, Z. (2015), "The role of dynamic capabilities in responding to digital disruption: a factor-based study of the newspaper industry", *Journal of Management Information Systems*, Vol. 32 No. 1, pp. 39-81, doi: [10.1080/07421222.2015.1029380](https://doi.org/10.1080/07421222.2015.1029380).
- Khin, S. and Ho, T.C. (2019), "Digital technology, digital capability and organizational performance: a mediating role of digital innovation", *International Journal of Innovation Science*, Vol. 11 No. 2, pp. 177-195, doi: [10.1108/IJIS-08-2018-0083](https://doi.org/10.1108/IJIS-08-2018-0083).
- Ko, A., Fehér, P., Kovacs, T., Mitev, A. and Szabó, Z. (2022), "Influencing factors of digital transformation: management or IT is the driving force?", *International Journal of Innovation Science*, Vol. 14 No. 1, pp. 1-20, doi: [10.1108/IJIS-01-2021-0007](https://doi.org/10.1108/IJIS-01-2021-0007).
- Koo, T.K. and Li, M.Y. (2016), "A guideline of selecting and reporting intraclass correlation coefficients for reliability research", *Journal of Chiropractic Medicine*, Vol. 15 No. 2, pp. 155-163, doi: [10.1016/j.jcm.2016.02.012](https://doi.org/10.1016/j.jcm.2016.02.012).
- Le, P.B. and Lei, H. (2019), "Determinants of innovation capability: the roles of transformational leadership, knowledge sharing and perceived organizational support", *Journal of Knowledge Management*, Vol. 23 No. 3, pp. 527-547, doi: [10.1108/JKM-09-2018-0568](https://doi.org/10.1108/JKM-09-2018-0568).
- Li, W., Liu, K., Belitski, M., Ghobadian, A. and O'Regan, N. (2016), "E-leadership through strategic alignment: an empirical study of small- and medium-sized enterprises in the digital age", *Journal of Information Technology*, Vol. 31 No. 2, pp. 185-206, doi: [10.1057/jit.2016.10](https://doi.org/10.1057/jit.2016.10).
- Lin, H.-C., Chiu, W.-H., Chang, C.-T. and Chen, S.-L. (2013), "Investigation of development strategies in knowledge-intensive business services-an example from Chunghwa Telecom", *2013 10th International Conference on Service Systems and Service Management*, pp. 29-34, doi: [10.1109/ICSSSM.2013.6602549](https://doi.org/10.1109/ICSSSM.2013.6602549).
- Liu, D.-Y., Chen, S.-W. and Chou, T.-C. (2011), "Resource fit in digital transformation: lessons learned from the CBC bank global e-banking project", *Management Decision*, Vol. 49 No. 10, pp. 1728-1742, doi: [10.1108/00251741111183852](https://doi.org/10.1108/00251741111183852).
- Liu, K., Nakata, K., Li, W. and Baranauskas, C. (Eds) (2018), *Digitalisation, Innovation, and Transformation: 18th IFIP WG 8.1 International Conference on Informatics and Semiotics in Organisations, ICISO 2018, Reading, UK, July 16-18, 2018, Proceedings*, Springer International Publishing, Vol. 527, doi: [10.1007/978-3-319-94541-5](https://doi.org/10.1007/978-3-319-94541-5).
- Lizano-Mora, H., Palos-Sanchez, P.R. and Aguayo-Camacho, M. (2021), "The evolution of business process management: a bibliometric analysis", *IEEE Access*, Vol. 9, pp. 51088-51105, doi: [10.1109/ACCESS.2021.3066340](https://doi.org/10.1109/ACCESS.2021.3066340).
- Lu and Ramamurthy, K.R. (2011), "Understanding the link between information technology capability and organizational agility: an empirical examination", *MIS Quarterly*, Vol. 35 No. 4, p. 931, doi: [10.2307/41409967](https://doi.org/10.2307/41409967).
- Marchand, D.A., Kettinger, W.J. and Rollins, J.D. (2002), *Knowledge-intensive Business Services*, OUP, Oxford.
- Matt, C., Hess, T. and Benlian, A. (2015), "Digital transformation strategies", *Business and Information Systems Engineering*, Vol. 57 No. 5, pp. 339-343, doi: [10.1007/s12599-015-0401-5](https://doi.org/10.1007/s12599-015-0401-5).
- MacKenzie, S.B., Podsakoff, P.M. and Podsakoff, N.P. (2011), "Construct measurement and validation procedures in MIS and behavioral research: integrating new and existing techniques", *MIS Quarterly*, Vol. 35 No. 2, p. 293, doi: [10.2307/23044045](https://doi.org/10.2307/23044045).

- Metcalfe, J.S. and Miles, I. (2000), "Introduction, overview and reprise", in Metcalfe, J.S. and Miles, I. (Eds), *Innovation Systems in the Service Economy: Measurement and Case Study Analysis*, Springer US, pp. 1-12, doi: [10.1007/978-1-4615-4425-8\\_1](https://doi.org/10.1007/978-1-4615-4425-8_1).
- Miles, I. (2005), "Knowledge intensive business services: prospects and policies", *Foresight*, Vol. 7 No. 6, pp. 39-63, doi: [10.1108/14636680510630939](https://doi.org/10.1108/14636680510630939).
- Miles, I., Belousova, V. and Chichkanov, N. (2017), "Innovation configurations in knowledge-intensive business services", *Foresight and STI Governance*, Vol. 11 No. 3, pp. 94-102, doi: [10.17323/2500-2597.2017.3.94.102](https://doi.org/10.17323/2500-2597.2017.3.94.102).
- Miles, I., Kastrinos, N., Bilderbeek, N., Den Hertog, P., Flanagan, K., Huntink, N. and Bouman, M. (1995), *Knowledge-intensive Business Services: Users, Carriers and Sources of Innovation*, EIMS Publication No. 15, Innovation Programme, Directorate General for Telecommunications, Information Market and Exploitation of Research, Commission of the European Communities, Luxembourg.
- Miozzo, M. and Grimshaw, D. (2005), "Modularity and innovation in knowledge-intensive business services: IT outsourcing in Germany and the UK", *Research Policy*, Vol. 34 No. 9, pp. 1419-1439, doi: [10.1016/j.respol.2005.06.005](https://doi.org/10.1016/j.respol.2005.06.005).
- Mokhtar, A. (2017), "A study of competencies that influence entrepreneur performance in retail business ventures in Malaysia", Southern Cross University.
- Muller, E. and Doloreux, D. (2007), "The key dimensions of knowledge-intensive business services (KIBS) analysis: a decade of evolution", Arbeitspapiere Unternehmen Und Region, U1/2007, available at: <https://www.econstor.eu/handle/10419/29335>
- Nadeem, A., Abedin, B., Cerpa, N. and Chew, E. (2018), "Digital transformation & digital business strategy in electronic commerce-the role of organizational capabilities", *Journal of Theoretical and Applied Electronic Commerce Research*, Vol. 13 No. 2, pp. 1-8, doi: [10.4067/S0718-18762018000200101](https://doi.org/10.4067/S0718-18762018000200101).
- Nair, J., Chellasamy, A. and Singh, B.N.B. (2019), "Readiness factors for information technology adoption in SMEs: testing an exploratory model in an Indian context", *Journal of Asia Business Studies*, Vol. 13 No. 4, pp. 694-718, doi: [10.1108/JABS-09-2018-0254](https://doi.org/10.1108/JABS-09-2018-0254).
- Neirotti, P., Raguseo, E. and Paolucci, E. (2017), "Flexible work practices and the firm's need for external orientation: an empirical study of SMEs", *Journal of Enterprise Information Management*, Vol. 30 No. 6, pp. 922-943, doi: [10.1108/JEIM-04-2016-0090](https://doi.org/10.1108/JEIM-04-2016-0090).
- Nguyen, T.H., Newby, M. and Macaulay, M.J. (2015), "Information technology adoption in small business: confirmation of a proposed framework", *Journal of Small Business Management*, Vol. 53 No. 1, pp. 207-227, doi: [10.1111/jsbm.12058](https://doi.org/10.1111/jsbm.12058).
- Nwankpa, J.K. and Datta, P. (2017), "Balancing exploration and exploitation of IT resources: the influence of Digital Business Intensity on perceived organizational performance", *European Journal of Information Systems*, Vol. 26 No. 5, pp. 469-488, doi: [10.1057/s41303-017-0049-y](https://doi.org/10.1057/s41303-017-0049-y).
- Nwankpa, J.K. and Roumani, Y. (2016), "IT capability and digital transformation: a firm performance perspective", *Thirty Seventh International Conference on Information Systems*, Dublin.
- Palos-Sanchez, P.R. (2017), "Drivers and barriers of the cloud computing in SMEs: the position of the European Union", *Harvard Deusto Business Research*, Vol. 6 No. 2, pp. 116-132.
- Palos-Sanchez, P.R., Arenas-Márquez, F.J. and Aguayo-Camacho, M. (2017a), "La adopción de la tecnología cloud computing (SaaS): efectos de la complejidad tecnológica vs formación y soporte", *RISTI - Revista Ibérica de Sistemas e Tecnologías de Informação*, Vol. 22, pp. 89-105, doi: [10.17013/risti.22.89-105](https://doi.org/10.17013/risti.22.89-105).
- Palos-Sanchez, P.R., Hernandez-Mogollon, J.M. and Campon-Cerro, A.M. (2017b), "The behavioral response to location based services: an examination of the influence of social and environmental benefits, and privacy", *Sustainability*, Vol. 9 No. 11, 1988, doi: [10.3390/su9111988](https://doi.org/10.3390/su9111988).
- Palos-Sanchez, P.R., Baena-Luna, P. and Casablanca Peña, A. (2019a), "Análisis de las competencias educativas para evaluar a las personas emprendedoras", *InterienciaRevista de ciencia y tecnología de América*, Vol. 44 No. 5, pp. 291-297.

- Palos-Sanchez, P.R., Correia, M.B. and Saura, J.R. (2019b), "An empirical examination of adoption of mobile applications in Spain and Portugal, based in UTAUT", *International Journal of Mobile Communications*, Vol. 17 No. 5, pp. 579-603.
- Palos-Sanchez, P.R., Saura, J.R., Rios Martin, M.Á. and Aguayo-Camacho, M. (2021), "Toward a better understanding of the intention to use mHealth apps: exploratory study", *JMIR MHealth and UHealth*, Vol. 9 No. 9, e27021, doi: [10.2196/27021](https://doi.org/10.2196/27021).
- Proksch, D., Rosin, A.F., Stubner, S. and Pinkwart, A. (2021), "The influence of a digital strategy on the digitalization of new ventures: the mediating effect of digital capabilities and a digital culture", *Journal of Small Business Management*, pp. 1-29, doi: [10.1080/00472778.2021.1883036](https://doi.org/10.1080/00472778.2021.1883036).
- Ravichandran, T. (2018), "Exploring the relationships between IT competence, innovation capacity and organizational agility", *The Journal of Strategic Information Systems*, Vol. 27 No. 1, pp. 22-42, doi: [10.1016/j.jsis.2017.07.002](https://doi.org/10.1016/j.jsis.2017.07.002).
- Rehman, A.U. and Anwar, M. (2019), "Mediating role of enterprise risk management practices between business strategy and SME performance", *Small Enterprise Research*, Vol. 26 No. 2, pp. 207-227, doi: [10.1080/13215906.2019.1624385](https://doi.org/10.1080/13215906.2019.1624385).
- Renko, M., Carsrud, A. and Brännback, M. (2009), "The effect of a market orientation, entrepreneurial orientation, and technological capability on innovativeness: a study of young biotechnology ventures in the United States and in Scandinavia", *Journal of Small Business Management*, Vol. 47 No. 3, pp. 331-369, doi: [10.1111/j.1540-627X.2009.00274.x](https://doi.org/10.1111/j.1540-627X.2009.00274.x).
- Rialti, R., Marzi, G., Silic, M. and Ciappei, C. (2018), "Ambidextrous organization and agility in big data era: the role of business process management systems", *Business Process Management Journal*, Vol. 24 No. 5, pp. 1091-1109, doi: [10.1108/BPMJ-07-2017-0210](https://doi.org/10.1108/BPMJ-07-2017-0210).
- Ribeiro-Navarrete, S., Botella-Carrubi, D., Palacios-Marqués, D. and Orero-Blat, M. (2021), "The effect of digitalization on business performance: an applied study of KIBS", *Journal of Business Research*, Vol. 126, pp. 319-326, doi: [10.1016/j.jbusres.2020.12.065](https://doi.org/10.1016/j.jbusres.2020.12.065).
- Richard, P.J., Devinney, T.M., Yip, G.S. and Johnson, G. (2009), "Measuring organizational performance: towards methodological best practice", *Journal of Management*, Vol. 35 No. 3, pp. 718-804, doi: [10.1177/0149206308330560](https://doi.org/10.1177/0149206308330560).
- Rigdon, E.E., Sarstedt, M. and Ringle, C.M. (2017), "On comparing results from CB-SEM and PLS-SEM: five perspectives and five recommendations", *Marketing ZFP*, Vol. 39 No. 3, pp. 4-16, doi: [10.15358/0344-1369-2017-3-4](https://doi.org/10.15358/0344-1369-2017-3-4).
- Ringle, C.M., Wende, S. and Becker, J.M. (2015), "SmartPLS release:3. Smartpls.Com", available at: <https://www.smartpls.com/terms>
- Roberts, N. and Thatcher, J. (2009), "Conceptualizing and testing formative constructs: tutorial and annotated example", *ACM SIGMIS Database: The Database for Advances in Information Systems*, Vol. 40 No. 3, pp. 9-39, doi: [10.1145/1592401.1592405](https://doi.org/10.1145/1592401.1592405).
- Roldán, J.L. and Sánchez-Franco, M.J. (2012), *Variance-Based Structural Equation Modeling: Guidelines For Using Partial Least Squares in Information Systems Research (Variance-based-structural-equation-modeling: Research Methodologies, Innovations and Philosophies in Software Systems Engineering and Information Systems)*, IGI Global, Hersey, PA, available at: <https://www.igi-global.com/gateway/chapter/www.igi-global.com/gateway/chapter/63264>
- Rupeika-Apoga, R., Petrovska, K. and Bule, L. (2022), "The effect of digital orientation and digital capability on digital transformation of SMEs during the COVID-19 pandemic", *Journal of Theoretical and Applied Electronic Commerce Research*, Vol. 17 No. 2, pp. 669-685, doi: [10.3390/jtaer17020035](https://doi.org/10.3390/jtaer17020035).
- Sánchez, M.R., Palos-Sánchez, P.R. and Velicia-Martin, F. (2021), "Eco-friendly performance as a determining factor of the adoption of virtual reality applications in national parks", *Science of the Total Environment*, Vol. 798, 148990, doi: [10.1016/j.scitotenv.2021.148990](https://doi.org/10.1016/j.scitotenv.2021.148990).
- Saura, J.R., Palos-Sanchez, P. and Blanco-González, A. (2020), "The importance of information service offerings of collaborative CRMs on decision-making in B2B marketing", *Journal of Business and Industrial Marketing*, Vol. 35 No. 3, pp. 470-482, doi: [10.1108/JBIM-12-2018-0412](https://doi.org/10.1108/JBIM-12-2018-0412).

- Scarso, E. and Bolisani, E. (2012), "Trust in knowledge exchanges between service providers and clients: a multiple case study of KIBS", *Knowledge Management Research and Practice*, Vol. 10 No. 1, pp. 16-26, doi: [10.1057/kmmp.2011.28](https://doi.org/10.1057/kmmp.2011.28).
- Schilke, O., Hu, S. and Helfat, C.E. (2017), "Quo vadis, dynamic capabilities? A content-analytic review of the current state of knowledge and recommendations for future research", *Academy of Management Annals*, doi: [10.5465/annals.2016.0014](https://doi.org/10.5465/annals.2016.0014).
- Shreckling, E. and Steiger, C. (2017), "Digitalize or drown", in Oswald, G. and Kleinemeier, M. (Eds), *Shaping the Digital Enterprise: Trends and Use Cases in Digital Innovation and Transformation*, Springer International Publishing, pp. 3-27, doi: [10.1007/978-3-319-40967-2\\_1](https://doi.org/10.1007/978-3-319-40967-2_1).
- Shryen, G. (2013), "Revisiting IS business value research: what we already know, what we still need to know, and how we can get there", *European Journal of Information Systems*, Vol. 22 No. 2, pp. 139-169, doi: [10.1057/ejis.2012.45](https://doi.org/10.1057/ejis.2012.45).
- Setia, P., Venkatesh, V., University of Arkansas and Joglekar, S. (2013), "Leveraging digital technologies: how information quality leads to localized capabilities and customer service performance", *MIS Quarterly*, Vol. 37 No. 2, pp. 565-590, doi: [10.25300/MISQ/2013/37.2.11](https://doi.org/10.25300/MISQ/2013/37.2.11).
- Shmueli, G., Sarstedt, M., Hair, J.F., Cheah, J.-H., Ting, H., Vaithilingam, S. and Ringle, C.M. (2019), "Predictive model assessment in PLS-SEM: guidelines for using PLSpredict", *European Journal of Marketing*, Vol. 53 No. 11, pp. 2322-2347, doi: [10.1108/EJM-02-2019-0189](https://doi.org/10.1108/EJM-02-2019-0189).
- Shrout, P.E. and Fleiss, J.L. (1979), "Intraclass correlations: uses in assessing rater reliability", *Psychological Bulletin*, Vol. 86 No. 2, pp. 420-428, doi: [10.1037/0033-2909.86.2.420](https://doi.org/10.1037/0033-2909.86.2.420).
- Singh, S.K., Gupta, S., Busso, D. and Kamboj, S. (2021), "Top management knowledge value, knowledge sharing practices, open innovation and organizational performance", *Journal of Business Research*, Vol. 128, pp. 788-798, doi: [10.1016/j.jbusres.2019.04.040](https://doi.org/10.1016/j.jbusres.2019.04.040).
- Škare, M. and Soriano, D.R. (2021), "A dynamic panel study on digitalization and firm's agility: what drives agility in advanced economies 2009-2018", *Technological Forecasting and Social Change*, Vol. 163, 120418, doi: [10.1016/j.techfore.2020.120418](https://doi.org/10.1016/j.techfore.2020.120418).
- Sousa-Zomer, T.T., Neely, A. and Martinez, V. (2020), "Digital transforming capability and performance: a microfoundational perspective", *International Journal of Operations and Production Management*, Vol. 40 Nos 7/8, pp. 1095-1128, doi: [10.1108/IJOPM-06-2019-0444](https://doi.org/10.1108/IJOPM-06-2019-0444).
- Statista—El portal de estadísticas (2022), "Statista", available at: <http://es.statista.com/buscar/>
- Strambach, S. (2008), "Knowledge-Intensive Business Services (KIBS) as drivers of multilevel knowledge dynamics", *International Journal of Services Technology and Management*, Vol. 10 Nos 2-4, pp. 152-174.
- Susskind, R.E. (2017), *Tomorrow's Lawyers: an Introduction to Your Future*, Oxford University Press, available at: <https://lib.hpu.edu.vn/handle/123456789/30701>
- Tajeddini, K. and Ratten, V. (2017), "The moderating effect of brand orientation on inter-firm market orientation and performance", *Journal of Strategic Marketing*, Vol. 28 No. 3, pp. 194-224, doi: [10.1080/0965254X.2017.1293138](https://doi.org/10.1080/0965254X.2017.1293138).
- Teece, D.J. (2007), "Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance", *Strategic Management Journal*, Vol. 28 No. 13, pp. 1319-1350, doi: [10.1002/smj.640](https://doi.org/10.1002/smj.640).
- Teng, X., Wu, Z. and Yang, F. (2022), "Research on the relationship between digital transformation and performance of SMEs", *Sustainability*, Vol. 14 No. 10, p. 6012, doi: [10.3390/su14106012](https://doi.org/10.3390/su14106012).
- Troise, C., Corvello, V., Ghobadian, A. and O'Regan, N. (2022), "How can SMEs successfully navigate VUCA environment: the role of agility in the digital transformation era", *Technological Forecasting and Social Change*, Vol. 174, 121227, doi: [10.1016/j.techfore.2021.121227](https://doi.org/10.1016/j.techfore.2021.121227).
- Umble, E.J., Haft, R.R. and Umble, M.M. (2003), "Enterprise resource planning: implementation procedures and critical success factors", *European Journal of Operational Research*, Vol. 146 No. 2, pp. 241-257, doi: [10.1016/S0377-2217\(02\)00547-7](https://doi.org/10.1016/S0377-2217(02)00547-7).

- Urbinati, A., Bogers, M., Chiesa, V. and Frattini, F. (2019), "Creating and capturing value from Big Data: a multiple-case study analysis of provider companies", *Technovation*, Vols 84-85, pp. 21-36, doi: [10.1016/j.technovation.2018.07.004](https://doi.org/10.1016/j.technovation.2018.07.004).
- van Dierendonck, D. and Sousa, M. (2016), "Finding meaning in highly uncertain situations: servant leadership during change", in Peus, C., Braun, S. and Schyns, B. (Eds), *Monographs in Leadership and Management*, Emerald Group Publishing, Vol. 8, pp. 403-424, doi: [10.1108/S1479-357120160000008015](https://doi.org/10.1108/S1479-357120160000008015).
- Velicia-Martin, F., Cabrera-Sanchez, J.-P., Gil-Cordero, E. and Palos-Sanchez, P.R. (2021), "Researching COVID-19 tracing app acceptance: incorporating theory from the technological acceptance model", *PeerJ Computer Science*, Vol. 7, e316, doi: [10.7717/peerj-cs.316](https://doi.org/10.7717/peerj-cs.316).
- Velicia-Martin, F., Folgado-Fernández, J.A., Palos-Sánchez, P.R. and López-Catalán, B. (2022), "mWOM business strategies: factors affecting recommendations", *Journal of Computer Information Systems*, pp. 1-14, Print Online.
- Vera, D. and Crossan, M. (2004), "Strategic leadership and organizational learning", *Academy of Management Review*, Vol. 29 No. 2, pp. 222-240, doi: [10.5465/amr.2004.12736080](https://doi.org/10.5465/amr.2004.12736080).
- Verhoef, P.C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Dong, J.Q., Fabian, N. and Haenlein, M. (2021), "Digital transformation: a multidisciplinary reflection and research agenda", *Journal of Business Research*, Vol. 122, pp. 889-901, doi: [10.1016/j.jbusres.2019.09.022](https://doi.org/10.1016/j.jbusres.2019.09.022).
- Vial, G. (2019), "Understanding digital transformation: a review and a research agenda", *Journal of Strategic Information Systems*, Vol. 28 No. 2, pp. 118-144, doi: [10.1016/j.jsis.2019.01.003](https://doi.org/10.1016/j.jsis.2019.01.003).
- Wang, Z., Rafait Mahmood, M., Ullah, H., Hanif, I., Abbas, Q. and Mohsin, M. (2020), "Multidimensional perspective of firms' it capability between digital business strategy and firms' efficiency: a case of Chinese SMEs", *SAGE Open*, Vol. 10 No. 4, doi: [10.1177/2158244020970564](https://doi.org/10.1177/2158244020970564).
- Warner, K.S.R. and Wäger, M. (2019), "Building dynamic capabilities for digital transformation: an ongoing process of strategic renewal", *Long Range Planning*, Vol. 52 No. 3, pp. 326-349, doi: [10.1016/j.lrp.2018.12.001](https://doi.org/10.1016/j.lrp.2018.12.001).
- Weill, P. and Aral, S. (2006), "Generating premium returns on your IT investments", *MIT Sloan Management Review*, Vol. 47 No. 2, p. 39, available at: <https://www.proquest.com/docview/224963540/abstract/58E7947237644724PQ/1>
- Westerman, G., Bonnet, D. and McAfee, A. (2014), *Leading Digital: Turning Technology into Business Transformation*, Harvard Business Press, Cambridge, MA.
- Wiesböck, F., Hess, T. and Spanjol, J. (2020), "The dual role of IT capabilities in the development of digital products and services", *Information and Management*, Vol. 57 No. 8, doi: [10.1016/j.im.2020.103389](https://doi.org/10.1016/j.im.2020.103389).
- Yadav, M.S. and Pavlou, P.A. (2020), "Technology-enabled interactions in digital environments: a conceptual foundation for current and future research", *Journal of the Academy of Marketing Science*, Vol. 48 No. 1, pp. 132-136, doi: [10.1007/s11747-019-00712-3](https://doi.org/10.1007/s11747-019-00712-3).
- Zhou, K.Z. and Wu, F. (2010), "Technological capability, strategic flexibility, and product innovation | EndNote click", *Strategic Management Journal*, Vol. 31, pp. 547-561, doi: [10.1002/smj.830](https://doi.org/10.1002/smj.830).

### Further reading

- Palos, P.R. and Correia, M.B. (2017), "La actitud de los recursos humanos de las organizaciones ante la complejidad de las aplicaciones SaaS", *Dos Algarves: Tourism, Hospitality and Management Journal*, Vol. 28, pp. 87-103, available at: <https://www.dosalgarves.com/index.php/dosalgarves/article/view/100>

(The Appendix follows overleaf)

	Frequency	Percentage
<i>Age of company</i>		
From 1 to 3 years	39	11.64
From 3 to 5 years	27	8.06
From 5 to 10 years	35	10.45
From 10 to 15 years	25	7.46
From 15 to 25 years	66	19.70
More than 25 years	143	42.69
<i>Volume of revenues</i>		
Does not know/Does not answer	15	4.47
Less than 50,000€	98	29.25
From 50,000 to 100,000€	85	25.37
From 100,000 to 500,000€	102	30.45
From 500,000–1M€	16	4.78
From 1M to 3 M€	14	4.18
From 3M to 10 M€	2	0.60
More than 10 M€	3	0.90
<i>Number of Employees</i>		
None	12	3.57
1. From 1 to 5 employees	231	68.96
2. From 6 to 10 employees	55	16.42
3. From 11 to 25 employees	27	8.06
4. From 26 to 50 employees	5	1.49
5. From 51 to 100 employees	3	0.90
6. From 250 employees	2	0.60
<i>Location</i>		
Less than 1,000 inhabitants	6	1.79
From 1,000 to 5,000 inhabitants	27	8.07
From 5,001 to 10,000 inhabitants	38	11.34
From 10,001 to 50,000 inhabitants	87	25.97
From 50,001 to 100,000 inhabitants	51	15.22
More than 100,000 inhabitants	126	37.61
<i>Total</i>	335	100.0

**Table A1.**  
Sample characteristics

**Source(s):** Authors own

Construct	Items	Source
Digital capability (Construct formative)	<p>CD1: [The electronic mandate is a basic document for the administrative manager.]. Remote signature of any type of document</p> <p>CD2: [The remote signature of documents has become an essential tool for the administrative manager.]. Remote signature of any type of document</p> <p>CP1: [Administrative agencies believes that digital transformation has an impact on being more competitive in its sector</p> <p>CP2: [Administrative agencies has begun its digital transformation under pressure from competitors, which have done so ]</p> <p>RA1: [The cloud enables you to manage business operations efficiently]</p> <p>RA2: [The use of cloud services improves the quality of operations]</p> <p>RA3: [Using the cloud allows you to perform specific tasks more quickly]</p> <p>RA4: [Cloud usage offers new opportunities]</p> <p>RA5: [Use of the cloud allows managers to increase business productivity]</p> <p>TR1: [Administrative agencies knows how the benefits of digital transformation can be used to support operations]</p> <p>TR2: [Within administrative agencies there are the skills needed to implement digital transformation]</p>	<p>Wiesböck <i>et al.</i> (2020), Khin and Ho (2019)</p>
Digital cloud technology (Construct reflective)	<p>Degree of implementation of digital tools in administrative agencies</p> <p>IMP: [cloud data storage device]</p> <p>IMP: [Integral management software -CRM Cloud o ERP Cloud-]</p> <p>IMP: [Professional management applications in the cloud]</p>	<p>Troise <i>et al.</i> (2022)</p>
Digital strategy (Construct reflective)	<p>[PLAN1: Efficiency improvement]</p> <p>[PLAN2: Decentralize decisions]</p> <p>[PLAN3: Reduce costs]</p> <p>[PLAN4: Adaptation to New Technologies]</p> <p>[PLAN5: Improve Customer Service]</p> <p>[PLAN6: Increase customer loyalty]</p> <p>[PLAN7: Increased productivity]</p> <p>[PLAN8: Market share increase]</p> <p>[PLAN9: Information management]</p> <p>[PLAN10: Decentralizing decisions]</p>	<p>Wang <i>et al.</i> (2020)</p>
Management support (Construct reflective)	<p>[TMS1: Administrative agencies management admits to implementing digital transformation]</p> <p>[TMS2: Administrative agencies management leads and is involved in the process when it comes to digital transformation]</p> <p>[TMS3: Administrative agencies' management is willing to assume the risks (financial and organizational) involved in the adoption of digital transformation]</p>	<p>Ko <i>et al.</i> (2022)</p>

**Table A2.**  
(continued) Measurement element

Construct	Items	Source
Organizational performance (Construct reflective)	[BEN1: Some of our competitors have already started to implement digital transformation] [BEN2: Access to new markets] [BEN3: Improved access to information] [BEN4: Improved communication] [BEN5: New business lines] [BEN6: More productivity] [BEN7: Customer knowledge] [BEN8: New customers] [BEN9: Time optimization] [BEN10: Time flexibility] [BEN11: Effectiveness decisions] [BEN12: Employee satisfaction]	Nwankpa and Roumani (2016), Bouwman <i>et al.</i> (2019)

**Table A2.** Source(s): Authors own

Construct: Digital capability								
	Type <sup>1</sup>	ICC <sup>2</sup>	F-test	df1	df2	p-value	95% Confidence interval <sup>3</sup>	
							Lower bound	Upper bound
Average_random_raters	ICC2k	0.82	6.5	334	3,340	6.8e-191	0.81	0.83
Construct: Digital cloud technology								
	Type <sup>1</sup>	ICC <sup>2</sup>	F-test	df1	df2	p-value	95% Confidence interval <sup>3</sup>	
							Lower bound	Upper bound
Average_random_raters	ICC2K	0.85	6.9	334	668	1.1e-98	0.83	0.86
Construct: Digital strategy								
	Type <sup>1</sup>	ICC <sup>2</sup>	F-test	df1	df2	p-value	95% Confidence interval <sup>3</sup>	
							Lower bound	Upper bound
Average_random_raters	ICC2K	0.92	16	334	3,006	0	0.92	0.93
Construct: Management support								
	Type <sup>1</sup>	ICC <sup>2</sup>	F-test	df1	df2	p-value	95% Confidence interval <sup>3</sup>	
							Lower bound	Upper bound
Average_random_raters	ICC2K	0.79	5.5	334	668	1.7e-78	0.76	0.81
Construct: Organizational performance								
	Type <sup>1</sup>	ICC <sup>2</sup>	F-test	df1	df2	p-value	95% Confidence interval <sup>3</sup>	
							Lower bound	Upper bound
	ICC2K	0.94	18	334	3,674	0	0.94	0.94

**Note(s):** <sup>1</sup> Type = CC2K is the two-way Mixed Effect Model convention using the mean value of *K* raters. Its calculation in RStudio is carried out by means of the following function: ICC (dataframe, missing = TRUE, alpha = 0.5, lmer = TRUE, check.keys = FALSE)

<sup>2</sup> CCI: Values between 0.75 and 0.9 indicate good reliability and values greater than 0.9 indicate excellent reliability (Koo and Li, 2016)

<sup>3</sup> At 95% confidence all CCI values are between the lower and upper limits

**Source(s):** Authors own

**Table A3.** ICC results according to RStudio

Construct: "Digital capability"					
Indicators	VIF	Weight	<i>p</i> values < 0.05*	Loadings	<i>p</i> values < 0.05*
[RA1]	1.368	0.128	0.033	0.563	0.000
[RA2]	2.218	0.004	0.956	0.716	0.000
[RA4]	2.404	0.251	0.003	0.830	0.000
[RA5]	3.047	0.547	0.000	0.904	0.000
[CD1]	2.554	-0.041	0.624	0.377	0.000
[CD2]	2.646	0.278	0.001	0.497	0.000
[CP2]	1.069	0.130	0.007	0.323	0.000
[TR1]	2.003	0.045	0.558	0.486	0.000
[TR2]	1.891	0.085	0.258	0.413	0.000

**Note(s):** *p* values is significant for <0.05

**Source(s):** Authors own

**Table A4.**  
Formative constructs

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