

Article

Effects of Digital Citizenship and Digital Transformation Enablers on Innovativeness and Problem-Solving Capabilities

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Featured Application: The study's findings indicate the positive outcomes of digital citizenship, while also exposing domains that fail to enhance innovativeness and problem-solving capabilities, with digital transformation enablers serving as a mediating factor.

Abstract: Doing business in the age of information abundance indicates the importance of developing information management skills, enabling the individuals to be more productive but also more flexible to changes. In literature, innovation, as a driver of a firm's performance, has been highlighted, while problem-solving capabilities are considered one of the key assumptions for the implementation of digital transformation strategy. The purpose of the study is to investigate the impact of digital citizenship and digital transformation enablers on innovation and problem-solving capabilities. The data collection procedure commenced by selecting a random sample of private companies from various industries. A survey was carried out, and a total sample of 247 valid questionnaires were collected. The PLS-SEM method was used to test the relationships in the proposed model. The study found that some elements of digital citizenship are positively associated with digital transformation enablers. The results of the study confirmed that technology-based digital transformation enablers positively contribute to innovation and problem-solving capabilities. Also, technological facets of digital transformation enablers realize a mediating role in the relationship between digital citizenship and innovation, as well as with problem-solving capabilities.

Keywords: digital citizenship; digital transformation enablers; digitalization; innovativeness; problem solving; digital transformation



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1. Introduction

The intensive changes in the business context that have occurred over the past decade have had a tremendously profound effect on business operations. The strategic response to these challenges has included both the adoption of disruptive technology and the transformation of the business model into one that is more responsive to the new reality. Frequently, digital transformation is regarded solely from the perspective of the increased use of digital technology, while the soft factor is neglected. Despite the fact that digitalization enables the substitution of human work, it continues to involve the people who bring about change and without whom the digitalization process itself would not be possible. Therefore, companies should have a clear vision of the changes and the application of available technological solutions in the implementation of a strategy supported by a new business model. The changing era has an effect on business, but it has also altered the characteristics of citizens, which should contribute to the implementation of the strategy. Due to the increase

in the number of youth digital citizens [1], digital citizenship not only implies access to online sources, but also encompasses the entire spectrum of digital elements, including responsibility [2], rights, safety and security [3,4], literacy [5], and collaboration [6].

The concept of digital citizenship is related to the development of critical thinking, responsible behavior [7], and the acquisition of new knowledge and skills that will contribute to better inclusion in the digital world. The changes in professional life, as well as the introduction of digital media, imply the development of appropriate skills that will enable the implementation of contemporary technological solutions [8]. The previous findings indicate that companies have experienced problems with the development of a digital culture and the acquisition of new skills that inevitably affect the installation of contemporary technologies [9].

Doing business in the age of information abundance highlights the importance of developing information management skills, since information literacy will be one of the indicators of success in the information technology environment, enabling individuals to be more productive but also more flexible to changes [10]. For instance, companies in different industries have to respond to consumer expectations regarding their security and data privacy. The ability to manage and secure consumer data is a challenge in this increasingly digital world [11]. In addition, one of the barriers to the implementation of digital transformation strategy concerns the lack of technical standards, which is particularly prevalent in manufacturing firms [12]. With respect to all these challenges, companies have to act as responsible entities and to respect established rules and norms need to be followed for sustainable business in the digital era [13].

One of the key challenges caused by entering the digital era is related to new opportunities for a company's collaboration with other actors in the digital world [6]. In addition, changes in the digital environment imply reduced time for strategic planning, a perception of the need for continuous change, decentralized management, the establishment of a culture of change and learning, massive training, etc. As a consequence of the presented changes, the company has the task of leveraging its strategy and culture in order to exploit the potential of digital transformation. Goals of digital transformation can be set as follows: understanding the changes in customer experience, increasing efficiency and innovative potential, and improving problem-solving and decision-making processes, with a special focus on response time. One of the benefits of using digital technologies is the capacity of people to work at different levels in different functional areas; for instance, using the opportunities for distance work at the employees' home and decision making on the basis of a real customer relationship [11].

Previous studies have shown that the implications of digital technologies, as a part of digital transformation, positively influence a firm's performance [14]. In literature, innovation as a driver of a firm's performance has been highlighted [15], while problem-solving effectiveness is considered one of the key assumptions for the implementation of digital transformation strategies in companies [16]. According to the evidence in the literature, it can be concluded that there are limited studies that explore the indirect effect of digital transformation enablers, while the level of digital readiness has an important indirect impact on the effective use of intangible assets [17].

According to the given evidence and presented elements of digital citizenship, there is a clear gap in the academic literature when it comes to the impact of digital citizenship and its elements on different aspects of companies' effectiveness. Moreover, there is no evidence about the effects of digital citizenship on digital transformation enablers, while there is some evidence that information management has a greater impact on business performance [18], and that information and data literacy as well as responsible and collaborative behavior are some of the essentials of being a "good digital citizen" [2,5,19]. Innovations are achieved by transforming business models and personalizing citizen experiences, considering the development of problem-solving skills as an assumption for the implementation of the new technological solution [11]. Previous studies proved that ICT capital investments have a positive effect on both technological and non-technological innovations in services and

manufacturing [15,20], and that problem-solving effectiveness is closely correlated with digital transformation [21]. The problems stated above and the identified literature gap led to the following research questions:

- How do digital citizenship and its elements affect digital transformation enablers?
- How do digital transformation enablers affect innovation and problem-solving capabilities?
- Do digital transformation enablers mediate the relations between digital citizenship elements and innovation and problem-solving capability, respectively?

The purpose of the study is to investigate the impact of digital citizenship and digital transformation enablers on innovation and problem-solving capabilities, and to examine the mediating role of digital transformation enablers in the relationship between digital citizenship and innovation as well as with problem-solving capabilities.

The manuscript has been partitioned into multiple sections. Following the introductory section, the study provides a concise overview of the pertinent literature and previous investigations related to the latent variables that constitute the conceptual framework. Subsequent to this segment, the methodology employed in the study is explained, followed by the presentation and interpretation of the results. A separate part provides a discussion of the acquired results. The final section of the manuscript encompasses the theoretical and practical implications, limitations of the study, prospects for future research, and concluding statements.

2. Literature Review

2.1. Digital Citizenship

The involvement of employees in the digital society is commonly articulated in terms of the role of a digital citizen who embodies “the characteristics of a genuine digital city” [22]. Moreover, digital citizens demonstrate legal and ethical behavior, personal responsibility for the continuous improvement of skills and competences through lifelong learning programs in order to be involved in social development based on digital transformation, and a positive attitude toward the application of modern technology solutions, such as online collaboration tools, productivity in action, and leadership [23]. Employees, as digital citizens, should be ready to use the internet effectively [24], understand digital content, and critically analyze the ethical opportunities and challenges related to digitalization [25]. Several approaches have been devised to comprehend and scrutinize diverse constituents of digital citizenship. The normative approach is frequently employed, encompassing digital citizenship as the adherence to norms governing appropriate and responsible behavior while utilizing technology [26].

In recent years, there has been a growing interest in the subject of digital citizenship, which has been the focus of several research studies. Numerous scholars have conducted research on the constituent components of digital citizenship with the aim of investigating its influence on digital transformation. Ribble [23] posits that digital citizenship comprises nine distinct areas of behavior, namely etiquette, communication, education, access, commerce, responsibility, rights, safety, and security. Choi [27] provided four constituent elements of digital citizenship: ethics in the use of digital technologies, media and information literacy, readiness to participate in digital transformation, and resistance. Isman and Canan Gungoren [25] identified several key competencies that are pertinent to digital citizenship, including digital access, digital commerce, digital communication and cooperation, digital etiquette, digital governance, digital health and well-being, digital law, digital rights and obligations, and digital security and confidentiality.

The exploration of various aspects of digital citizenship serves the purpose of not only modifying the current training framework but also of equipping employees with the necessary skills to effectively participate in the digital realm. In addition, the utilization of elements can enable enterprises to actualize the synergistic benefits presented by digital transformation. Implementation of a digital transformation strategy implies the use of digital technology adequately in order to achieve a competitive advantage [28]. Digital

citizens are the initiators of product development (entrepreneurs), and they are also the main initiators of the transformation of business models and the creation of new digital business models (e.g., Facebook, Instagram, [Tripadvisor.com](https://www.tripadvisor.com)) [29]. Drawing upon the literature review, our study identified five important aspects of digital citizenship, namely information and data literacy, information security management, digital piracy, responsibility, and collaboration. These elements are considered to have a significant influence on the effective implementation of digital transformation initiatives.

2.2. Information and Data Literacy

Going into details of digital citizenship, information and data literacy is one of the key aspects of being a “good digital citizen”. Data literacy is defined as the component of information literacy that empowers “individuals to access, interpret, critically assess, manage, handle and ethically use data” [5]. Information literacy provides answers to acknowledged employees’ need to access, handle, use, and understand information effectively in order to solve problems, to be fully social integrated, to achieve personal and professional development, and to provide contributions to society. The European Union, as well as other countries, emphasizes the significance of promoting and facilitating digital literacy among all individuals. This phenomenon can be attributed to the significant advancements in technology over the past three decades. The role of ICT professionals, as well as the role of individuals/managers, has been changing with regard to technology. ICT professionals are no longer “just” programmers, but they are also people who can understand the business. Individuals/managers are not “just” end users of technology but also people who can create, develop, and implement new businesses based on new technology [30]. In contrast to the past, where proficiency in information and data literacy was exclusively expected of ICT experts, contemporary advancements in business and society necessitate that all employees possess a satisfactory degree of digital literacy for successful participation in business processes. The development of a novel agenda for employees in a digital society is primarily contingent upon their information and data literacy, which is essential for accessing required content and complying with the contemporary demands of digital transformation.

The results of previous research have shown that information resources are increasingly important organizational resources in digital transformation and in the era of growing competition [8]. It has been proven that data, information, and different types of knowledge can have a significant impact on the improvement of business performance [31]. Although IT infrastructure provides the basis for implementing digital transformation, information management has a greater impact on business performance, since employees are trained to effectively manage available information [18]. The successful implementation of digital technology for business transformation hinges on the extent to which employees are willing to adopt and integrate it into their operational processes. Hence, the significance of employee information and data literacy is twofold, as it facilitates the utilization of existing technology and promotes the adoption of emerging technology.

2.3. Information Security Management

Aligned with the principles of information and data literacy, it is imperative to cultivate the practice of information security management. There are many serious factors that can cause problems in professional life, such as data breaches, malicious out/insiders, identity theft, access policy violations, etc. Solving such fraud was initially attempted by advancing technology solutions. According to Soomro et al. [4], the preservation of information security management is approached as a technical matter. The concept entails the integration of several aspects for effective information security management. First, the development and implementation of an information security policy is crucial for protecting data and should encompass a comprehensive policy, security control mechanisms, and an awareness and training program [32]. Second, business information architecture serves as a foundation and facilitates the coordination of solutions to security issues [33]. Third, busi-

ness strategy plays a significant role in influencing information security management [34]. Lastly, alignment between business operations and IT is essential to ensure the efficacy of information security management [35,36].

Further literature research showed that the human factor is the weakest part of information security. In addition, scholars stress that technological solutions depend on information security policy and organizational strategies. Those two things caused information security management to be seen in a managerial context more so than in a technological context. On the one hand, in order to assure effective digital transformation, managers need to participate in the non-technical side of information security, as stated earlier in defining the development and execution of information security police. On the other hand, IT professionals need to enable the safeguarding of data [4]. Managers without IT professionals, as well as IT professionals without the support of managers, cannot provide effective and efficiency security and management of data [36]. The increasing significance of managing information security highlights the necessity for all stakeholders involved in digital transformation to be cognizant of the potential hazards and prospective issues associated with the utilization of digital technology. In this way, its application can be encouraged while preventing problems and avoiding its misuse.

2.4. Digital Piracy

One of the key barriers to the implementation of digital transformation strategy is related to the lack of technical standards [37]. Creating standards or following existing ones is a question of strategic orientation, which is related to digital law and digital rights [12,38]. In literature, digital law is explored “as the awareness among the public to abide by laws and ethics of technology in a society, so that the actions and deeds can be controlled and foreseen” [39]. The field of digital law pertains to the observance of ethical standards in the application of digital technology and its benefits. Therefore, employees who perform significant roles as contributors or consumers in the digital world should exercise prudence in this regard [12].

The application of established standards and respecting the appropriate behavioral framework could assure better safety improvements [40], while applying new business models could contribute to superior business performance [12]. One of the possible behaviors regarding the previous concepts is digital piracy. Digital piracy is defined as “the illegal act of copying digital goods, software, digital documents, digital audio (including music and voice), and digital video for any reason other than to back up without explicit permission from and compensation to the copyright holder” [41]. Knowledge of illicit activity and an awareness of potential repercussions can expedite the adoption of digital technologies when they are utilized for appropriate purposes, such as in business processes or in public service use.

2.5. Responsibility

Digital citizenship brings awareness not only about civic responsibilities or self-responsibility but also about how digital technology enables new forms of participation. Digital rights and responsibilities cover the basic set of rights and responsibilities that needs to be imposed on a digital citizen. Digital rights cover human and legal rights which employees have during the accession, usage, creation, and publication of digital content on devices, in virtual spaces, and in communities [42]. Together with communication, education, and access, digital rights are seen as policy makers’ responsibility. Digital responsibility, together with etiquette, commerce, safety, and security, is seen as an individual responsibility [2]. For instance, responsible usage of the internet based on location (e.g., home/office) and practices such as maintaining the originality of the content that is generated on the web, giving proper citations in the content, maintaining the confidentiality and privacy of data, incorporating encryption, e-signatures if required, etc. come under the purview of digital citizenship.

Digital technologies are fundamentally changing social institutions, communications, and relationships. They also give impetus to the transition to a digital economy and the emergence of new structures of government. In fact, today, it is impossible to imagine planning for economic, cultural, and political development apart from digitalization. It is important to take these processes into account in the case of creating a legal framework for digital citizens. For instance, citizens do not miss the opportunity to use digital public services. Since society is gradually being “digitalized”, legislation, as a regulator of social relations, has to regulate these relations in order to provide success in using digital services [39].

2.6. Collaboration

Digital transformation enables a wide range of digital systems and value networks, which companies use for creating interactions with different actors in their networks [6]. Hence, the effective utilization of digital technologies for collaborative work among multiple employees is a crucial aspect of thriving in the contemporary era [19]. Efficient collaboration is made possible through the utilization of digital collaboration tools, which facilitate digital collaboration. Various classifications of digital tools are accessible for collaborative purposes. The study conducted by Andersson and Mutlu [43] identified several technological tools that are commonly used for remote communication and collaboration. These tools include video-conferencing tools like Zoom and Skype, messaging and communication tools such as Microsoft Outlook, Google Mail, and Skype, and file-sharing platforms like Google Drive. The utilization of collaborative tools in the domain of a digital citizen has the potential to facilitate the seamless integration and utilization of digital collaborative platforms within the professional setting. Furthermore, by exhibiting digital citizenship in the workplace, employees have the potential to catalyze transformative advancements in the realm of digital collaborative technologies, resulting in streamlined coordination and heightened productivity.

Digital tools for collaboration require new competences, while appropriate practical, professional, and technical support should be available in companies. New knowledge and skills facilitate the implementation of digital transformation strategies through inspiring new product developments [44]. Moreover, digital tools enable the effective use of resources, knowledge, and capabilities among different groups of stakeholders, which can have a critical role in collaborative innovation processes [45]. This kind of innovation has been perceived as one of the pillars for achieving superior performance in the digital age, while knowledge sharing has been crucial for transforming ideas into innovation outcomes [6]. Taking advantage of digital tools for collaborative purposes facilitates expeditious information exchange and flawless knowledge sharing, thereby establishing a foundation for generating new ideas, stimulating innovation, and accelerating problem-solving processes.

2.7. Digital Transformation Enablers

The tools, technologies, and organizational context that facilitate the implementation of digital transformation within organizations are commonly referred to as digital transformation enablers. Schallmo et al. [46] defined digital transformation enablers as applications or services that enable the digital transformation of a business model. When considering digital transformation, it is possible to analyze digital enablers from various viewpoints. Brunetti et al. [47] identified a group of internal and external enablers. The first refers to the internal environment of the organization, which comprises HR and leadership practices, organizational culture, and the skills and competencies that employees should cultivate. The second refers to the external relationships established by the organization through the supply chain and collaborative partnerships in order to achieve a sustainable digital transformation. Lokuge and Duan [48] employed the same classification for identifying digital transformation enablers, but the content is noticeably distinct. Internal enablers include elements such as sustainable technology capabilities, partnership accessibility,

and skilled people, while external enablers include digital technology, the current state of digital competition, and customers' readiness to respond to a business model shaped by digital transformation. Regardless of the differences in content, the common feature of both classifications is the perspective that digital transformation is enabled by factors that are largely under the control of the company or that are largely dependent on the environment. Through an initial process of systematization, it is feasible to categorize all the aforementioned enablers into two groups: those that are technology-related and those that are people-related. Imran et al. [49] indicate that key enablers of digital transformation represent a combination of technological factors and the social system of the organization and state the importance of understanding new digital technologies, data-driven decision making, culture sharing, continuous learning, and improvements to achieve the expected organizational outcomes.

Our study framework focuses on the technological facets of digital transformation enablers. Prior studies have underscored the significance of technology in enabling digital transformation and have concentrated solely on its role as a most important enabler. Châlons and Dufft [50] state that technological developments are key digital transformation enablers and list mobile technologies, social media, cloud computing, big-data analytics and the Internet of Things as key technological developments. The aforementioned technologies facilitate the process of digital transformation by effectively managing digital initiatives that align with strategic objectives, facilitating a seamless exchange of data across the organization, ensuring effective governance of digital content and data security, and fostering collaboration with digital technology vendors. Tsiavos and Kitsios [51] also identified technology as an enabler of digital transformation. The authors specifically highlight cloud computing, 3D printing, 5G, APIs, the Internet of Things, robotic automation, and artificial intelligence as key technological enablers. Junge [52] enumerated a set of technological enablers, which encompass ICT, blockchain technology, virtual and augmented reality, cyber-physical systems, and additive manufacturing. Sestino et al. [53] identified the Internet of Things and big data as enablers of digital transformation. Sensor technology, nanotechnology, and self-driving vehicles can be added to the mentioned technologies, which enable the digitalization of the supply chain [54].

The classification of numerous technological enablers of digital transformation poses a challenge due to their high degree of complementarity and mutual conditioning. Schallmo et al. [46] made a breakthrough by classifying them into four categories that include digital data and the processes associated with them, automation that uses artificial intelligence to create systems less dependent on human work, digital customer access, and networking through broadband telecommunications. The majority of the aforementioned technologies are prevalent across a significant number of companies. However, it is noteworthy that precise terminology may not always be readily available, as employees tend to prioritize operational and functional aspects in their daily work, rather than nomenclature.

2.8. Digital Transformation and Innovation

Digital transformation is disrupting businesses in every industry by breaking down barriers between people, businesses, and resources. As a consequence, they are able to create new products and services and find more efficient ways of doing business [55]. Using previously mentioned digital tools, it is possible to develop new ideas through communications among business partners in the value chain [14]. The main goal for digital transformation is to change the existing situation and to create new production processes, new products, or new markets. The success in this field will be a good predictor of the ability to achieve a competitive advantage and to create new value [56].

These innovations are occurring in various companies across diverse industries. Innovations are usually achieved by transforming processes and business models, or personalizing citizen experiences. Companies are faced with the challenges of integrating digital technologies and their ability to transform processes, engage talent and acquire new skills, and create new business models to compete in the digital age [11]. Digital transformation

enables the building of a network, using digital technologies or processes, that allows a company to achieve better supply chain visibility, IT capabilities, and knowledge sharing [14]. According to previous evidence in the literature, it has been confirmed that ICT capital investments are more important for product and process innovation. Aboal and Tacsir [20] and Gaglio et al. [15] find that ICT capital investments have a positive effect on both technological and non-technological innovations in services and manufacturing. The technological enablers of digital transformation, such as ICT, provide a solid foundation for encouraging innovation via initiatives aimed at generating new ideas, transforming the business model, enhancing processes, or developing a novel strategy for exploiting market opportunities.

2.9. Digital Transformation and Problem-Solving

Companies on their digital journey need to recognize that digital transformation is more than just the implementation of technology. The changes considered within digital transformation refer to a corporate shift in the mindset of companies of all sizes and sectors [55]. Challenges faced by companies in the digital era are various and cause different problems. Therefore, the framework for digital readiness emphasizes the development of competitions related to the problem-solving process [57]. A problem-solving process does not only mean problem identification but also active cognitive thinking about a given situation [58]. Problem-solving capabilities consist of a sequence of processes beginning with the identification of a problem situation and concluding with recognizing that the chosen solution has produced the desired result. The solver is expected to understand the situation and recognize the nature of the situation, as well as monitor the progress of the implementation of the plan that should lead to solving the problem [59].

Regarding the influence of digital transformations on problem-solving capabilities, there exist two conceivable scenarios. The initial concept pertains to utilizing digital media as a means of acquiring problem-solving capabilities and subsequently applying them to practical issues. The latter notion involves facilitating the cognitive processes of comprehending, assimilating, and implementing the fundamental features and principles of digital technologies. The application of an appropriate strategy is deemed essential in the process of problem-solving. Each of the digital strategies requires a specific set of skills and capabilities in order to implement the solution to a certain problem. Although the studies about strategy effectiveness are limited, it is known the implementation of a digital strategy requires that individuals think flexibly and creatively about how to overcome obstacles in the process of finding a solution [21], which implies that the implementation of the solution includes the appropriate level of employee readiness, especially in terms of technology literacy [11]. Based on the presented findings, it can be inferred that the utilization of digital technologies and the requisites of digital transformation necessitate cultivation of the problem-solving capacity among employees.

2.10. The Conceptual Framework

The literature review indicates that there is a prevalence of exploratory works that concentrate on identifying the components of digital transformation enablers and the various types of digital citizenship behavior. The quantity of scholarly articles and research studies that examine the effects and impacts of digital transformation remains limited. This sets the stage for research endeavors that center on the impacts of digital citizenship and digital transformation at large, as well as on the enablers of digital transformation in particular. According to Imran et al. [49], the process of digital transformation involves the collaborative efforts of both the social and technical systems, with the latter comprising the digital technologies utilized within the organization. The attainment of desired outcomes can be facilitated through the harmonization of both digital technologies and the social system, which encompasses the human resources and other intangible elements of the organization. Our study's social system is supported by digital citizenship. Thus, our research incorporates the social system and digital technology, while analyzing the social

system's impact on digital transformation enablers. A previous study demonstrated that information and data literacy and information security management, as components of digital citizenship, have a positive effect on change management and risk management during digital transformation [60]. Thus, the assumption was made that digital citizenship can positively contribute to the organization's faster adoption of digital technology and the establishment of digital transformation enablers. With this in the background, the following hypotheses are provided:

Hypothesis 1a (H1a). *Information and data literacy of digital citizenship is positively associated with digital transformation enablers.*

Hypothesis 1b (H1b). *Information security management of digital citizenship is positively associated with digital transformation enablers.*

Hypothesis 1c (H1c). *Digital piracy of digital citizenship is positively associated with digital transformation enablers.*

Hypothesis 1d (H1d). *Responsibility of digital citizenship is positively associated with digital transformation enablers.*

Hypothesis 1e (H1e). *Collaboration of digital citizenship is positively associated with digital transformation enablers.*

An important research contribution and incentive for further research in the field of digital transformation was brought by Vial [61]. By creating building blocks of the digital transformation process based on an extensive review of the literature, the aforementioned author established relationships between the various constituents of digital transformation and proposed that digital transformation enablers influence changes in value creation paths, with a possible positive impact on organizational performance and operational efficiency but also a possible negative impact on security and privacy. The positive effects of digital transformation on innovation and productivity were confirmed in a study conducted by Gaglio et al. [15]. The positive impact of digital transformation on innovative performance was also confirmed in a study by Chen and Kim [62]. The application of information technologies in digital transformation should enable the ability to innovate, be agile, and use data intelligently for making strategic decisions and solving problems in business processes and operations [50]. Junge [52] concludes that digital technologies used in business processes and in the integration of the organizational infrastructure and employees, enable new capabilities such as decentralization in decision making or autonomy in problem-solving process. Based on the aforementioned, the conceptual model establishes direct relationships between digital transformation enablers and both innovation and problem-solving (Figure 1). The previous interpretation leads to the development of the hypotheses below:

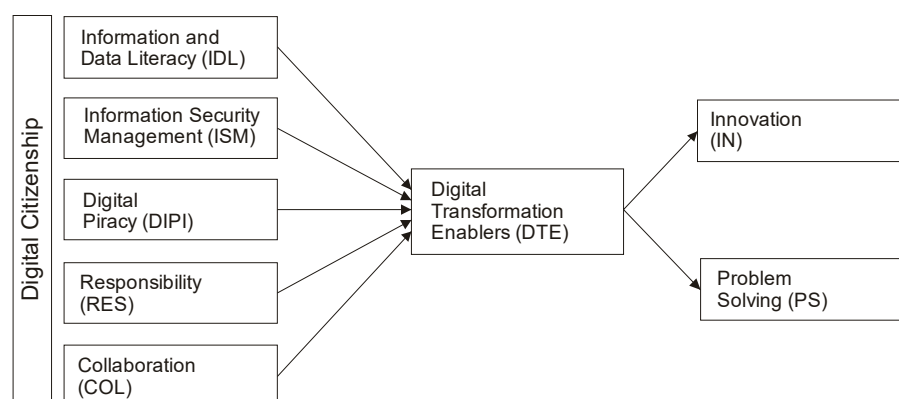


Figure 1. Conceptual model.

Hypothesis 2a (H2a). *Digital transformation enablers are positively associated with innovation.*

Hypothesis 2b (H2b). *Digital transformation enablers are positively associated with problem-solving capabilities.*

Companies using more digitally embedded business processes obtain higher performance benefits from their IT solutions [63]. Digital integration among suppliers and value-chain partners are capable of reducing the coordination cost, transaction cost [64], and agent cost through increased communication, transparency, and monitoring [65]. Companies whose business models leverage digital technologies attempt to improve their performance through the transformation of customer-side business operations and the data, information, and ideas [14].

It has been proven that the main difficulties in implementing a digital transformation strategy are not technologies, but human factors and intangible resources, cultural traditions, employees' resistance to change, lack of motivation and risk taking [11]. Companies have to adjust their organizational contexts in order to satisfy the needs of employees and to assure the efficient usage of available resources [66]. It has been proven that a higher level of digital readiness has a positive impact on organizational success and contributes to better profitability compared with companies with a lower level of digital readiness. Additionally, it has been proven that the use of digital technology indirectly affects a firm's performance and contributes to a stronger impact of intangible assets on the firm's performance [17]. Thus, the present study also aims to investigate the potential mediating role of digital transformation enablers in the relationship between digital citizenship and innovation and problem-solving capabilities. Therefore, the following hypotheses are presented:

Hypothesis 3a (H3a). *Digital transformation enablers mediate the effect of digital citizenship on innovation.*

Hypothesis 3b (H3b). *Digital transformation enablers mediate the effect of digital citizenship on problem-solving capabilities.*

3. Methodology

3.1. Sampling

The data collection procedure commenced by selecting a random sample of 400 private companies from various industries in Serbia. Prior to initiating the sampling procedure, we employed the inverse-square-root method [67] and determined that a minimum of 166 respondents would be required for the study and the findings to maintain validity. The exclusion of IT firms from the sample was based on the premise that their utilization of digital technologies is inherent to their operations, rendering them incomparable with other industries. The utilization of the key informant approach was implemented to procure pertinent data for subsequent statistical analysis. In accordance with ethical standards, all potential participants were assured of the research's academic background and were guaranteed anonymity if they chose to participate. The confidentiality of demographic data pertaining to potential respondents has been guaranteed, and the research data obtained are subject to strict controls to prevent unauthorized access by any third party. The research team received initial consent from 313 managers, who were subsequently invited to participate in the questionnaire on a voluntary basis and according to their availability. Following a period of two weeks, a total of 252 questionnaires were obtained. Following a comprehensive verification process, 247 of these questionnaires were considered to be valid and suitable for further data analysis.

The results of the descriptive statistical analysis indicate that 29.9% of the sample is composed of manufacturing firms, whereas 70.1% of the sample is composed of service industry firms. Micro and small companies comprise 35.2% of the sample, whereas medium and large companies constitute the majority with 64.8%. The survey sample consisted

of 58.2% female respondents, and the remaining participants were male. The sample is composed of 56.2% of respondents who are below the age of 40, with the remaining 43.8% being above this age. The sample population comprises individuals with varying levels of educational attainment. Specifically, the largest proportion of the sample (34.4%) consists of individuals who have completed a graduate degree. This is followed by respondents who have obtained a high school degree (19.4%), while the remaining 46.2% of the sample have attained a high school diploma.

3.2. Measurements

For the purpose of observing latent variables, measurement instruments that had been used in prior studies and that had demonstrated good predictive ability and reliability were utilized. A two-step procedure was employed in order to increase confidence in the statement's validity. The first stage involved translating the original English items and adapting them to the standard meaning in the Serbian context. The second stage involved the substantiation of statements via pilot testing with a sample of 30 respondents. The obtained results showed that the measurement scales meet the validity criteria in the national context and that the sampling procedure could be continued. The respondents were asked to assess every statement using a 5-point Likert scale ranging from "strongly disagree" (with a value of 1) to "strongly agree" (with a value of 5). The study employed distinct measurement scales for each construct, including the "Digital Citizenship" variable, which comprised five constructs, namely information and data literacy, information security management, digital piracy, responsibility, and collaboration.

Information and Data Literacy (IDL). This construct uses seven statements [57], such as "I know ICT devices and tools applicable for the storage and retrieval of data", "I am able to gather internal and external knowledge and information needs", and "I am able to make information available".

Information Security Management (ISM). This construct consists of three statements [57], such as "I am able to apply relevant standards, best practices and legal requirements for information security", and "I am aware of possible security threats".

Digital Piracy (DIPI). This construct uses three items proposed by Yoon [68]: "I would feel guilty if I pirated digital products", "It would be morally wrong for me to pirate digital products", and "If I have a chance, I will never pirate digital products".

Responsibility (RES). This construct consists of four items [2]. The following statements are examples of statements used for this construct: "I use the computer within the timeline given by the instructor", "I am aware of copyright infringement", and "I am aware of the AUP (Acceptable Use Policy) of the web".

Collaboration (COL). This construct uses five items proposed by Maicana et al. [19]. Illustrative examples of statements include: "I actively use tools for video collaboration, such as Google Meet, Skype, Zoom etc.", "I actively use enterprise/organization-level social network applications, such as Yammer, Office365, Google Workspace etc.", and "I actively use professional social networks, such as LinkedIn, HR.com etc.".

Digital Transformation Enablers (DTE). This construct uses of four items [69]: "Our core processes are automated", "We have an integrated view of key operational and customer information", "We use analytics to make better operational decisions" and "We use digital technology to improve performance and/or the value of our existing products and service".

Innovation (IN). This construct consists of eight items [57,70]. The following statements are examples of statements used for this construct: "I actively think about improvements for the work of direct colleagues", "I am aware of business, society and/or research habits, trends and needs", "I am able to identify business advantages and improvements of adopting emerging technologies", and "In collaboration with colleagues, I transform ideas in a way that they become applicable in practice".

Problem-solving (PS). This construct uses five statements [57], such as "I am able to identify potential critical component failures and take action to mitigate effects of failure",

“I am able to allocate appropriate resources to maintenance activities, balancing cost and risk”, and “I am able to choose the right tool, device, application, software or service to solve (non-technical) problems”.

4. Results and Analysis

The relationships established in the conceptual model were tested using the partial-least-squares approach to structural equation modeling (PLS-SEM). The application of the mentioned approach is very effective when working with a large number of constructs and relations that together create a complex model. In addition, the PLS-SEM approach demonstrated good analytical performance in working with non-normally distributed data and when testing the statistical significance of indirect relationships between latent variables [71]. Using the results of the identified indirect relationships and additional statistical analysis, the mediator effect can be discovered. An additional argument for the application of the mentioned approach was identified in previous studies of an interdisciplinary type. Similar to our study, previous studies on strategic management [72] and information systems [73] successfully applied the partial-least-squares approach to structural equation modeling. The SEM approach was deployed using a two-step procedure, as described by Anderson and Gerbing [74], to validate the measurement model and to assess the quality of the structural model. Preliminary data preprocessing was conducted using version 24 of the statistical program SPSS. The study utilized SmartPLS 4.0 software to compute the essential indicators of the reflective model as defined.

4.1. Measurement Model Assessment

The PLS algorithm’s procedure was carried out to perform confirmatory factor analysis, which included testing the reliability and validity of each statement used to constitute the constructs. The items “To pirate digital products goes against my principles” (DIPI02) and “I am able to communicate at all levels to ensure appropriate resources are deployed internally or externally to minimize outages” (PS04) did not meet the required criteria and therefore were excluded from assessment. Table 1 displays the results of the reliability of the proposed model’s internal consistency and of the convergent validity analyses. The Cronbach’s alpha coefficient (α) was adequate for all the model constructs according to the criteria established by Nunnally and Bernstein [75]. The composite reliability (CR) of all latent variables was considerably greater than the 0.7 threshold [73]. The appropriate values of the two aforementioned indicators lead to the conclusion that the study’s internal consistency is strong. The value of the average variance extracted (AVE) indicator ranges from 0.572 to 0.831 and is greater than 0.5 [76]. Multicollinearity is not a concern in the present study. The variance inflation factor (VIF) was utilized for the analysis of collinearity, and all values of this coefficient for the items used in the study are substantially less than 5, which is the upper limit of validity.

Table 1. Measure model and constructs.

Construct and Item Description	Convergent Validity	VIF	Composite Reliability	α	AVE
Digital Citizenship					
IDL: Information and Data Literacy			0.918	0.916	0.6
IDL01	0.824	2.839			
IDL02	0.858	3.209			
IDL03	0.790	2.391			
IDL04	0.830	2.520			
IDL05	0.753	2.016			
IDL06	0.819	2.613			
IDL07	0.838	2.777			

Table 1. Cont.

Construct and Item Description	Convergent Validity	VIF	Composite Reliability	α	AVE
ISM: Information Security Management			0.890	0.814	0.729
ISM01	0.876	1.575			
ISM02	0.865	2.030			
ISM03	0.818	1.967			
DIPI: Digital Piracy			0.936	0.929	0.831
DIPI01	0.851	2.092			
DIPI03	0.948	4.006			
DIPI04	0.932	3.828			
RES: Responsibility			0.903	0.866	0.709
RES01	0.743	1.772			
RES02	0.887	2.348			
RES03	0.891	2.508			
RES04	0.839	1.984			
COL: Collaboration			0.896	0.890	0.695
COL01	0.737	1.851			
COL02	0.850	2.400			
COL03	0.872	2.941			
COL04	0.876	3.531			
COL05	0.827	3.302			
DTE: Digital Transformation Enablers			0.760	0.753	0.572
DTE01	0.711	1.558			
DTE02	0.728	1.741			
DTE03	0.772	1.657			
DTE04	0.810	1.316			
IN: Innovation			0.917	0.913	0.621
IN01	0.768	2.063			
IN02	0.802	2.183			
IN03	0.810	2.330			
IN04	0.820	2.721			
IN05	0.823	2.640			
IN06	0.791	2.171			
IN07	0.765	2.091			
IN08	0.722	1.934			
PS: Problem-Solving			0.893	0.851	0.626
PS01	0.794	1.826			
PS02	0.805	1.906			
PS03	0.819	1.993			
PS05	0.747	1.612			
PS06	0.790	1.788			

Source: Authors.

Discriminant validity was evaluated using two criteria, namely the Fornell–Larcker criterion and the heterotrait–monotrait (HTMT0.85) criterion. Most studies use only one of the mentioned criteria, but due to a greater confidence in the results obtained through the structural model assessment, we applied both criteria. Table 2 demonstrates that the study's constructs satisfy the Fornell–Larcker criterion [77]. In accordance with the heterotrait–monotrait (HTMT0.85) criterion [78], Table 3 confirms that all constructs record values less than 0.85, thus satisfying the HTMT0.85 criterion. Taking into account the results in both tables, it is possible to conclude that all of the constructs used in the study contain values that meet both criteria and that satisfactory discriminant validity was attained.

Table 2. Discriminant validity (Fornell–Larcker criterion).

Constructs	1	2	3	4	5	6	7	8
1. COL: Collaboration	0.834							
2. DIPI: Digital Piracy	0.035	0.911						
3. DTE: Digital Transformation Enablers	0.435	0.190	0.756					
4. IDL: Information and Data Literacy	0.403	0.382	0.543	0.817				
5. IN: Innovation	0.397	0.180	0.459	0.648	0.788			
6. ISM: Information Security Management	0.232	0.460	0.387	0.703	0.477	0.854		
7. PS: Problem-Solving	0.245	0.256	0.481	0.587	0.502	0.572	0.791	
8. RES: Responsibility	0.132	0.513	0.427	0.579	0.396	0.561	0.476	0.842

Source: Authors.

Table 3. Discriminant validity (HTMT0.85 criterion).

Constructs	1	2	3	4	5	6	7	8
1. COL: Collaboration	–							
2. DIPI: Digital Piracy	0.064							
3. DTE: Digital Transformation Enablers	0.516	0.225						
4. IDL: Information and Data Literacy	0.442	0.428	0.637					
5. IN: Innovation	0.434	0.199	0.524	0.701				
6. ISM: Information Security Management	0.272	0.551	0.478	0.816	0.554			
7. PS: Problem-Solving	0.274	0.303	0.585	0.668	0.565	0.689		
8. RES: Responsibility	0.146	0.593	0.489	0.634	0.420	0.667	0.556	–

Source: Authors.

4.2. Structural Model Assessment

The standard PLS-SEM bootstrapping procedure was applied for the assessment of path coefficients between the defined constructs. The results of the structural model assessment related to the direct relationships between the latent variables are shown in Table 4. The results of the statistical analysis confirmed that information and data literacy is positively related to digital transformation enablers ($\beta = 0.318, p < 0.001$) and that the relationship is statistically significant. Thus, hypothesis H1a is supported. The relationship between information security management and digital transformation enablers, as well as the relationship between digital piracy and digital transformation enablers, is not statistically significant. The conclusion is that hypotheses H1b and H1c are not supported. Regardless of that fact, it is worth stating that the obtained values for the path coefficient are negative but discrete. The remaining two constructs of digital citizenship, namely responsibility and collaboration, have a positive association with digital transformation enablers ($\beta = 0.242, p < 0.001$; $\beta = 0.284, p < 0.001$), and therefore the hypotheses H1d and H1e are supported. The results of the structural model assessment revealed that digital capability enablers are positively related to innovation ($\beta = 0.463, p < 0.001$). Also, the results obtained using the bootstrapping procedure confirmed the positive association between digital capability enablers and problem-solving capabilities ($\beta = 0.482, p < 0.001$). The results of the study supported both hypotheses H2a and H2b.

The same bootstrapping procedure was applied to evaluate indirect effects and to detect the mediator effect. The results of the statistical analysis, representing the values of path coefficients for indirect effects, are shown in Table 5. A statistically significant indirect effect and a positive relationship between information and data literacy and innovation through digital transformation enablers was revealed ($\beta = 0.147, t = 2.819, p < 0.01$), as well as between information and data literacy and problem-solving capabilities through digital transformation enablers ($\beta = 0.153, t = 3.039, p < 0.01$). Information security management did not report a statistically significant indirect relationship with innovation and problem-solving capabilities through digital transformation enablers. Also, the indirect association between digital piracy and innovation as well as with problem-solving capabilities through digital transformation enablers is not statistically significant. Despite this, it is worth stating

that the values of the path coefficients for the four previously mentioned relations record are negative but very discrete values. Responsibility recorded a positive indirect effect on innovativeness ($\beta = 0.112, t = 3.013, p < 0.01$), as well as on problem-solving capabilities ($\beta = 0.117, t = 2.917, p < 0.01$), including an intervening role of digital transformation enablers. The intervening role of digital transformation enablers was recorded in the positive and statistically significant relationship between collaboration and innovation ($\beta = 0.131, t = 4.304, p < 0.001$), as well as between collaboration and problem-solving capabilities ($\beta = 0.137, t = 4.743, p < 0.001$). To validate the mediator effect, the method described by Zhao et al. [79] was employed. The application of the aforementioned method and further analysis of the path coefficients confirmed that digital transformation enablers serve as a partial mediator between the constructs of digital citizenship and innovation and problem-solving capabilities in all indirect relationships for which a statistically significant indirect effect was previously confirmed. Thus, both hypotheses H3a and H3b were partially confirmed.

Table 4. Results of testing the research model: direct effects.

Relationship	Path Coefficient	t-Value	95% CIs (Bias-Corrected)	Results
IDL → DTE	0.318 ***	3.339	[0.130, 0.501]	Supported
ISM → DTE	−0.020	0.235	[−0.187, 0.143]	Not supported
DIPI → DTE	−0.044	0.681	[−0.174, 0.087]	Not supported
RES → DTE	0.242 ***	3.212	[0.072, 0.371]	Supported
COL → DTE	0.284 ***	4.852	[0.172, 0.388]	Supported
DTE → IN	0.463 ***	9.001	[0.355, 0.556]	Supported
DTE → PS	0.482 ***	9.507	[0.369, 0.572]	Supported

Notes: IDL: Information and data literacy; ISM: Information security management; DIPI: Digital piracy; RES: Responsibility; DTE: Digital transformation enablers; IN: Innovation; COL: Collaboration; PS: Problem-solving; *** $p < 0.001$. Source: Authors.

Table 5. Results of testing the research model: indirect effects.

Relationship	Path Coefficient	t-Value	95% CIs (Bias-Corrected)	Results
IDL → DTE → IN	0.147 **	2.819	[0.054, 0.255]	Supported
IDL → DTE → PS	0.153 **	3.039	[0.058, 0.257]	Supported
ISM → DTE → IN	−0.009	0.233	[−0.090, 0.066]	Not supported
ISM → DTE → PS	−0.010	0.231	[−0.089, 0.073]	Not supported
DIPI → DTE → IN	−0.020	0.675	[−0.082, 0.038]	Not supported
DIPI → DTE → PS	−0.021	0.667	[−0.085, 0.040]	Not supported
RES → DTE → IN	0.112 **	3.013	[0.037, 0.183]	Supported
RES → DTE → PS	0.117 **	2.917	[0.034, 0.192]	Supported
COL → DTE → IN	0.131 ***	4.304	[0.076, 0.194]	Supported
COL → DTE → PS	0.137 ***	4.743	[0.082, 0.192]	Supported
	Stoner-Geisser Q ²	R ²	GOF	
Digital Transformation Enablers	0.346	0.381	0.363	
Innovation	0.276	0.211	0.241	
Problem-Solving	0.242	0.231	0.236	
SRMR	0.070			

Notes: IDL: Information and data literacy; ISM: Information security management; DIPI: Digital piracy; RES: Responsibility; DTE: Digital transformation enablers; IN: Innovation; COL: Collaboration; PS: Problem-solving; ** $p < 0.01$; *** $p < 0.001$. Source: Authors.

Standard coefficients used in the partial-least-squares approach to structural equation modeling were used to assess the quality of the structural model. The conceptual model proposed in the study recorded a standard root-mean-square (SRMR) value of 0.07, which is less than the upper limit set at 0.09 [80]. A cross-validated redundancy index (Stone-Geisser Q²) for digital transformation enablers, innovation, and problem-solving capabilities was calculated to be 0.346, 0.276, and 0.242, respectively (Table 5). All the listed values are positive and indicate the good quality of the structural model. The

recorded values for the coefficient of determination of the explained variance (R squared) indicator showed that for the 38.1 percent of digital transformation enablers, 21.1 percent of innovations, and 23.1 percent of problem-solving capabilities, all indicate a high level of explanatory power in the proposed structural model. Using the square root of the product of communality and R^2 , the goodness-of-fit (GOF) was manually computed for all dependent and intermediate latent variables. The GOF values for digital transformation, innovation, and problem-solving capabilities was calculated as 0.363, 0.241, and 0.236, respectively, and generally meet the acceptable range of 0–1.

5. Discussion

This paper proposed and tested a conceptual model on the relationship between the constituents of digital citizenship and digital transformation enablers, as well as examined the influence of digital transformation enablers on innovation and problem-solving capabilities. The indirect relationship between digital citizenship and innovation, as well as with problem-solving capabilities, through digital transformation enablers is included in the model. The results of the study indicated that a one-point increase in information and data literacy, responsibility, and collaboration would increase digital transformation enablers based on technology by 0.318, 0.242, and 0.284 points, respectively. These results also lead to the conclusion that among all the constituents of digital citizenship included in the study, facet information and data literacy contribute the most to digital transformation enablers. Two facets of digital citizenship, namely information and security management and digital piracy, meet the necessary verification criteria obtained through confirmatory factor analysis (CFA) and measurement assessment (convergent validity, VIF, composite reliability, α , AVE), but their direct relationship with digital transformation enablers was not confirmed, nor was there an indirect connection with innovation and problem-solving capabilities. A very strong relationship between digital transformation enablers and innovation was confirmed, as well as an association between digital transformation enablers and problem-solving capabilities. In fact, a one-point increase in digital transformation enablers would increase innovation and problem-solving capabilities by 0.463, and 0.483, respectively. The obtained results of the study have a significant theoretical and practical contribution. Despite the unexpected absence of a statistically significant relationship between information security management and digital piracy on the one hand, and digital transformation enablers on the other hand, this result has extremely significant practical implications.

The results of our study contribute to the extension of digital transformation theory in a number of ways. First, our study confirmed that digital citizenship comprises different behavioral domains [23,27]. Information and data literacy, information security management, digital piracy, and responsibility have been identified and verified as elements of digital citizenship. Second, our study showed that digital citizenship has an active role in digital transformation through the strengthening of digital transformation enablers based on technology and the transformation of business models through innovation [29]. Third, the strong relationship between technological facets of digital transformation enablers and innovation [15,20] and problem-solving capabilities [30] were confirmed by our research. This is in line with previous research that identified technology as an enabler of digital transformation [51]. Fourth, our study indirectly confirms the postulates of STS theory by emphasizing the importance of digital citizenship, as a social aspect of complex systems, and digital transformation enablers, based on technological developments for achieving positive effects of digital transformation, such as innovation and problem-solving capabilities. This was confirmed by previous research that revealed that enablers of digital transformation integrate technological factors and the social system [49]. Fifth, our study contributes to the body of literature on digital transformation in general, and particularly on digital citizenship, digital transformation enablers, innovation and problem-solving capabilities related to digital transformation requirements.

The study has significant managerial implications. First, information and data literacy, responsibility, and collaboration can serve as incentives for digital transformation enablers based on technology and technological developments. Therefore, special attention to HR activities, such as recruitment, selection, training, and development, should be paid for because they can have a positive effect on the mentioned elements of digital citizenship. Second, information security management and digital piracy are identified as important elements of digital citizenship, but without a positive contribution to digital transformation enablers, innovation, and problem-solving capability. This fact indicates that greater employee awareness of the risks of applying digital technologies can block or inhibit digital transformation and reduce innovative potential and problem-solving capabilities, taking into account the presumption that there is a lack of awareness regarding the tools available for reducing risks. Considering that information security management and digital piracy are important elements of digital citizenship, they cannot be neglected. It is very important for practitioners to invest more effort in providing additional explanations to employees regarding the risks of using digital technologies, so that their use does not result in fear but in increased caution. Third, integrating social and technological elements is the most successful strategy for initiating and implementing digital transformation successfully. Employee behavior that constitutes digital citizenship generates the capacity to enable digital transformation based on technological development and tools. Together, the digital citizenship of employees and technological enablers of digital transformation through integrated action create the potential for encouraging innovation and improving problem-solving capabilities.

6. Conclusions

The purpose of the study is to examine the effect of digital citizenship and digital transformation enablers on innovation and problem-solving capabilities, as well as to examine the mediating role of digital transformation enablers in the relationship between digital citizenship and innovation and problem-solving capabilities. The study's contribution can be classified into three distinct dimensions. The findings indicate that the digital transformation enablers are positively impacted by a significant proportion of the digital citizenship elements. A surprising and significant result of the study is the absence of a positive and statistically significant relationship between information security management and digital piracy on the one hand, and digital transformation enablers on the other. Second, the results of the study establish a relationship between digital transformation enablers and the effects of digital transformation. Third, the study offers insights into the mediating role of digital transformation enablers in the relationship between digital citizenship and innovation and problem-solving capabilities.

The intensive digitization that is present in the economy is a significant incentive for changing business models and starting the process of digital transformation with the aim of achieving a sustainable competitive advantage. This transformation, although primarily related to modern technology, reflects its impact on social actors and society as a whole, encouraging the role of an active participant [81]. Previous research has confirmed that technology can act as enablers of digital transformation [82], but that the active role of social actors and people-related matters cannot be ruled out. The findings of our study indicate that digital citizenship contributes positively to technological facets of digital transformation enablers through three components: information and data literacy, responsibility, and collaboration. Despite expectations, two components of digital citizenship, namely information security management and digital piracy, did not achieve statistically significant relationships with digital transformation enablers. The results of the study confirmed that technology-based digital transformation enablers positively contribute to innovation and problem-solving capabilities. Also, technological facets of digital transformation enablers realize a mediating role in the relationship between digital citizenship and innovation, as well as with problem-solving capabilities.

Considering the characteristics of the study, we identified certain limitations. The first limitation refers to the facets of digital transformation enablers. Previous research has shown that digital transformation enablers include technological and social systems, through whose interaction digital transformation is achieved. Digital transformation enablers in our study are supported only from the technological aspect. Social aspects of digital transformation are not completely excluded from our study. They are present through the constituents of digital citizenship, but in the study, they are not included as enablers, but as drivers. Second, the respondents who participated in the study are of different levels of education and age. These two categorical variables could have an impact on the development of digital citizenship as a whole. Third, firms from a variety of industries are included in the study, which may be a limitation due to the fact that the rate and scope of digital transformation vary across economic sectors. Fourth, although meeting the criterion of the minimum number of respondents, the sample size still remains very modest, especially compared with studies conducted in countries with significantly greater economic power and a larger number of companies. Finally, the study was conducted in Serbia, which is making significant progress in the digitalization of the economy, but which has not yet reached the level of leading Western countries.

The limitations mentioned serve as guidelines for future research endeavors. The potential influence of categorical variables, such as education level or age, on the development of digital citizenship allows for the comparison of various groups in order to identify differences. A comparable analysis procedure can be used to determine the differences between the digital transformation levels attained by various industries. Thus, it would provide better insight into which industries are at the forefront of digital transformation and can therefore serve as a benchmark for other economic actors. A comparative study based on a sample of companies from Serbia and some other countries can be useful for determining the significance of the national context on digital transformation enablers or digital citizenship. Finally, the absence of a statistically significant relationship between information security management and digital piracy, as constituents of digital citizenship, and digital transformation enablers indicates a potential research gap. In this context, the subject of future research can be a more detailed analysis of the mentioned facets of digital citizenship and more insight into their role in digital transformation.

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