

DIGITAL TRANSFORMATION READINESS OF PROJECT-BASED ORGANISATIONS: EVIDENCE FROM SERBIA

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Abstract The advancement of IT and the growing digital economy are driving companies towards digital transformation (DT). DT is a complex phenomenon that affects all organizational areas. In the degree of technological preparation, it is not enough to only technologically prepare employees and management and provide access to advanced technological solutions, but also it is necessary to grant their empowerment, a strategy that cares about and attends to cognitive aspects of human capital, such as agility, competence, and self-efficacy. The purpose of this paper is investigating the readiness in project-based organisations (PBOs) for the DT. Each project was considered as a temporary piece of work with the purpose of achieving a specific business goal or objective. In total, 212 responses from project managers were collected regarding 212 different projects conducted in the last 5 years. The results of conducted analysis show the current level of DT readiness of Serbian PBOs, and propose the framework for the assessment.

Key words: *Digital Transformation, Projects, Project-Based Organisations, Serbia*

1. INTRODUCTION

Today's enterprises mostly rely on the implementation of various business processes, initiatives, or projects. To successfully carry out these activities, an enterprise needs to adequately prepare, which includes adjusting the design of its organizational structure, teamwork, and development, as well as adopting a project approach. A project-oriented organization is one that aims to meet the needs of various stakeholders while simultaneously executing numerous projects aimed at creating future product and service offerings, alongside the necessary transformation of the organization to enhance its competitiveness (Gemünden, Lehner & Kock, 2018).

Digitalization has enabled traditional enterprises to simplify data management, implement more efficient and personalized solutions, increase process automation, which has further emphasized the importance of project management activities. Sophisticated technologies enable more streamlined execution and monitoring of project tasks, and this is a significant benefit because it allows saving time and money, as important elements of the “iron triangle”. The vision of Industry 4.0 is the implementation of digital technologies, automated equipment and information communication technologies (Oesterreich & Teuteberg, 2016), in order to improve product quality, reduce time to market and improve business performance (Brettel, Friederichsen, Keller & Rosenberg, 2014).

On the other hand, as technological complexity increases, project outcomes become more uncertain, and the discipline of project management further evolves. First of all, the mentioned changes refer to the modification of the existing business model or the creation of a new model based on digital capabilities. The reconfiguration of the value creation process, the rise of digital ecosystems, and the resulting complexity and uncertainty in project outcomes demand that organizations adopt a more structured and proactive approach to project management (Voss & Kock, 2013) and the more effective utilization of existing tangible and intangible resources (Duodu & Rowlinson, 2019).

Due to the changes caused by digitization point out the importance of monitoring the readiness of managers and employees to implement transformation processes. The concept of DT readiness has emerged reflecting a willingness and preparedness to implement digital technologies and embrace innovation to pave the way for organizational success and goal attainment (Nasution et al., 2018). Previous research indicates that greater DT readiness correlates with enhanced organizational success and increased profitability, contrasting with organizations that exhibit lower levels of digital readiness. (Rafiah et al., 2022).

In the context of project management, DT readiness remains a relatively underexplored area. This is surprising given that PBOs have well-defined principles for effectively executing projects in the digital economy (Gemünden et al., 2018). The characteristics of emerging technologies significantly influence the management of intellectual resources (Secundo *et al.*, 2017). The emergence of artificial intelligence has led to the development of new competencies and has altered the role of humans in the value creation process (Mitchell *et al.*, 2013). Considering previous evidence, the following research question is posed:

RQ: What is the current level of DT readiness of Serbian PBOs?

The results of the conducted research make a significant contribution to the project management literature, as readiness for DT enables organizations to more efficiently use digital tools and technologies, which can lead to increased efficiency in project execution. The use of digital technologies facilitates the improvement of project management practices and easier implementation of innovations, enabling a proactive approach in responding to changes in the environment. In addition to technologies, readiness for digitalization will be an important factor in managing other resources of PBOs, such as people and finances.

After the introductory part, the paper provides an overview of the theoretical framework and summarizes findings from prior studies. Subsequently, a research model is constructed to align with the paper's objectives. The methodology is then outlined, followed by a discussion of the analysis results. At the end, the discussion of the results was given, as well as a conclusion in which the implications and limitations of the research were presented.

2. THEORETICAL BACKGROUND

Today's enterprises are executing a greater number of projects simultaneously at any given time. Consequently, there is a need for coordination and control of a wider range of complex projects to ensure that projects lead to the achievement of strategic objectives, foster synergy between projects, adapt to changes, and achieve effective teamwork (Gemünden, Lehner & Kock, 2018). According to Gareis and Huemann (2000), a project-oriented organization is a temporary

organization whose main task is not the delivery of end products resulting from project execution, but rather a management decision to organize a certain business task as a project.

According to the results of previous studies, as many as two-thirds of projects involving the implementation of DT requirements are unsuccessful (Libert et al., 2016). The reasons are numerous, with one of the main ones being the misalignment between formulating a DT strategy and its implementation, including a failure to consider important change management aspects related to employees as the main performers and customers as the recipients of change (Correani, et al. 2020). Projects serve as a potent tool for value creation (Winter & Szczepanek, 2008; Slavković & Simić, 2019), which is why it is necessary to establish monitoring mechanisms during implementation to meet stakeholders' expectations effectively (Pekuri, Pekuri & Haapasalo, 2013).

The digitization process covers almost all activities within the value chain, from procurement to sales and marketing, as well as project management activities (Slavković & Simić, 2019). Starting from the fact that changes as a result of digital disruptions are necessary, projects represent the way of responding to digital disruptions by certain parts of the organisation, management and employees themselves (Correani et al. 2020). The changes caused by DT are extensive, so it is important to explore whether it is possible to use traditional project management or whether it should be used in combination with other procedures and methods; what adjustments in the field of project management need to be implemented; what principles should be followed?

3. METHODOLOGY

The target population was PBOs in Serbia operating in different industries. To gain access to research participants, PBOs were approached using Business Registry Agencies database¹. Following the criteria by Keegan & Turner (2002), there were two types of PBOs: (1) organisations whose work is primarily based on the implementation of projects, such as civil engineering and IT firms (2) organisations that are mainly operationally oriented but implement projects as an important part of their overall activities, such as manufacturing firms. The sample structure according to the organizational characteristics is presented in Table 1. Project managers of each project were asked to collect the specially designed questionnaire. Engaging project managers and considering their perceptions of project execution is deemed valuable due to the substantial alignment found between managerial perspectives and objective performance indicators (Mir, 2019). In total, after excluding invalid responses, there were 212 responses from project managers regarding 212 different projects.

Table 1: Sample structure

		Absolute frequencies	Relative frequencies
Company's size	under 50 employees	39	18.40%
	51 - 250 employees	133	62.74%
	over 250 employees	40	18.87%

¹ <https://www.apr.gov.rs>

Sum		212	100.00%
Company's age	Less than 10 years	26	12.26%
	From 10 to 25 years	73	34.43%
	More than 25 years	113	53.30%
	Sum	212	100.00%
Ownership	Domestic private capital	152	71.70%
	Foreign capital	56	26.42%
	State	4	1.89%
	Sum	212	100.00%

The questionnaire was used to measure respondents' attitudes towards DT readiness. Several statements were used related to monitoring the development of human capital in the organization (Bontis, 1998; Engström et al., 2003; Wu and Tsai, 2005), as well as statements for measuring the readiness of employees and managers to implement the necessary changes to maximize the positive effects of digital technology implementation (Ferrari et al., 2014; Nwankpa and Roumani, 2016; Satoglu et al., 2018). A five-point Likert scale was used to measure respondent attitudes. Exploratory factor analysis was conducted to identify dimensions describing readiness for DT. According to the results (KMO = 0.808; Bartlett's test of sphericity = 1725.987; df = 91; $p < 0.001$) and after eliminating low factor weights below 0.60 (Howard, 2016), three factors of human capital were identified: attitude, competence, agility, confirmed in previous research by Bontis et al. (1999). Additionally, factor analysis (KMO = 0.856; Bartlett's test of sphericity = 1822.472; df = 78; $p < 0.001$) identified three components of DT: culture, organization, and technology, in accordance with previous research by Menchini et al. (2022) and Gill & VanBoskirk (2016).

To answer to the research question, three models using structural equation modelling are developed. Details for all latent variables in the survey are outlined in Table 2. All measures of the internal consistency (Cronbach's α) of the formed variables lie well above the cut-off point of 0.6 (George & Mallery, 1999), ranging between 0.660 and 0.845. Factor loadings range between 0.63 and 0.99, which is way above conventional cut-off values (Henson & Roberts, 2006). In terms of the convergent validity of measures, the composite reliability (CR) of all measures is well above the suggested threshold of 0.600. The average variance extracted (AVE) is well and above the suggested level of 0.500 (Fornell & Larcker, 1981). Putting these pieces together, we can conclude that our measures are reliable. Goodness of fit statistics were calculated and presented in Table 3. All indices suggest that the hypothesized models have a good fit with the data. Although RMSEA is above suggested interval 0.05 - 0.08, proposed by Hair et al. (2006), the obtained values are acceptable, considering cut-off value 0.1 suggested by Steiger (1990).

Table 2: Latent variables, measurement items, factors loadings, AVE, CR and Cronbach's Alpha

Model 1	Fact. load.	AVE	CR	Cr. α	Fact. load.	AVE	CR	Cr. α	Fact. load.	AVE	CR	Cr. α
<i>Attitude</i>		0.697	0.822	0.816		0.735	0.844	0.816		0.716	0.832	0.816
Item 1	0.82				0.99				0.94			
Item 2	0.85				0.70				0.74			
<i>Competence</i>		0.641	0.781	0.769		0.625	0.833	0.769		0.627	0.834	0.828
Item 3	0.83				0.84				0.87			
Item 4	0.77				0.77				0.76			
Item 5					0.76				0.74			
<i>Agility</i>		0.633	0.775	0.761		0.639	0.778	0.761		0.628	0.770	0.761
Item 6	0.83				0.71				0.73			
Item 7	0.76				0.88				0.85			
<i>Culture</i>		0.506	0.671	0.660								
Item 8	0.75											
Item 9	0.67											
<i>Organisation</i>						0.570	0.797	0.778				
Item 10					0.83							
Item 11					0.63							
Item 12					0.79							
<i>Technology</i>										0.627	0.770	0.766
Item 13									0.74			
Item 14									0.84			

Table 3: Goodness of fit statistics

Fit index	Recommended value	Model 1	Model 2	Model 3
χ^2/df	<5(3)	2.655	2.825	2.756
IFI	>0.90(0.95)	0.973	0.945	0.958

GFI	>0.90	0.964	0.935	0.947
TLI	>0.90	0.935	0.911	0.923
NFI	>0.90	0.957	0.918	0.936
CFI	>0.90(0.95)	0.972	0.944	0.957
AGFI	>0.80	0.892	0.873	0.880
RMSEA	<0.1(0.08)	0.089	0.093	0.091

4. FINDINGS

The means, standard deviations are presented in Table 4. The calculation of means and standard deviation is performed, that represents the degree of respondents' agreement with the given statements, as well as the homogeneity of the respondents' attitudes. The presented values of mean value show the current level of DT readiness of Serbian PBOs. Considering project managers' assessment, the level of digital readiness is above 3.5, while the highest level of agreement is identified in case of culture, as a relevant dimension of DT readiness.

Table 4: Mean values, standard deviations

Variable	Mean	Stan. Dev.
1. Attitude	3.8939	.79203
2. Competence	3.9214	.76736
3. Agility	3.9151	.76960
4. Culture	4.2170	.82617
5. Organisation	3.5928	.98450
6. Technology	3.5354	1.07753

5. DISCUSSION AND CONCLUSION

The research approach used contributed to the understanding the concept of DT readiness of PBOs. According to the results of exploratory factor analysis three human capital components are identified, that corresponds with previous studies by Bontis et al. (1999). Firstly, competencies include employees' skills and knowhow necessary for the finishing everyday tasks. Second, attitude considers motivation, and how employees perceive the leadership qualities of the top management. Finally, agility is the ability of organisational members to be 'quick on their intellectual feet', their creativity and innovation potential, and the ability to adapt and cross-fertilise.

Regarding DT readiness, the results of exploratory factor analysis revealed three dimensions: (1) culture as employees' awareness of the implementation of digital technology, and how they are empowered by management team; (2) organization as organizational capacity to assure effective implementation of digital strategy and innovation; (3) technology as an organizational readiness to use and adoption of emerging technology. Previous dimensions are in accordance to the study conducted by Gill and VanBoskirk, (2016). It is supposed that surveyed PBOs still are engaged in process of digital strategy implementation, therefore it is difficult to assess the

tangible effects of its implementation. Accordingly, Gill and VanBoskirk, (2016) propose insights as one dimension, but in this research, it is excluded considering previous explanation.

This research contributes to the framework development, that enables assessing DT readiness in PBOs. Moreover, it gives insights into key dimensions that are useful for the monitoring the improvement of DT, and how it may be improved the current level of organizational readiness. The conducted research proved that, despite the emergence of artificial intelligence, intellectual resources have still the important role in adaptation and survival in the era of digitization. The human brain is indispensable on the way to improving organizational readiness for contemporary challenges, despite the rapid progress of technology and the increasingly frequent use of robots. The application of new technology can speed up the process of performing manual tasks, while at higher levels, permanent progress is expected in terms of mastering new tools and tools, which can be used to improve decision-making processes and problem solving.

In view of the achieved results, further researches are suggested to deepen the understanding on the relationship of intellectual resources and DT readiness of PBOs. In addition, it should be considered organizational and personal characteristics as possible moderators in relation between intellectual resources and DT readiness.

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