

Publication status: This preprint has not been published elsewhere.

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Edimara Mezzomo Luciano, Guilherme Costa Wiedenhöft, Mônica Fitz-Oliveira

<https://doi.org/10.1590/0034-761220260036x>

Submitted on: 2026-08-17

Posted on: 2026-08-18 (version 1)

(YYYY-MM-DD)

Article

Organizational citizenship behavior, strategic alignment and value generation in digital transformation

Edimara Mezzomo Luciano ¹

Guilherme Costa Wiedenhöft ²

Mônica Fitz-Oliveira * ²

* Correspondent Author

¹ Pontifícia Universidade Católica do Rio Grande do Sul, Programa de Pós-Graduação em Administração, Porto Alegre, RS, Brazil

² Universidade Federal do Rio Grande, Programa de Pós-Graduação em Administração, Rio Grande, RS, Brazil

Abstract

The digital transformation phenomenon has impact on private and public organizations, from different aspects. This study assessed the association among digital transformation competence, public servant behavior, IT-business alignment and IT governance in the process to generate public value based on digital transformation initiatives. A survey encompassing 1.202 Brazilian public servants was carried out in a descriptive-confirmative study. Public value depends on digital transformation-related competencies within digital transformation environments, since it is influenced by both public servants' behavior (organizational citizenship behavior) and IT-business alignment. Some managerial and governance competencies are needed for the implementation of digital transformation initiatives aimed at generating public value. The main theoretical contribution of this study lied on developing and validating the theoretical model and the research instrument. In addition, its main contribution for organizations was the possibility of identifying the need of meeting some primary conditions in organizations to open room for digital transformation initiatives.

DOI: <https://doi.org/10.1590/0034-761220260036x>

Submitted on January 22, 2026 and accepted on August 05, 2026.

[Original Version]

Keywords: digital transformation, organizational citizenship behavior, IT-business alignment, IT governance.

Comportamento de cidadania organizacional e alinhamento estratégico na geração de valor a partir da transformação digital

Resumo

A transformação digital é um fenômeno que tem impactado organizações privadas e públicas em diferentes aspectos. Nesse sentido, o objetivo do artigo é avaliar a associação entre competência em transformação digital, comportamento dos servidores públicos, alinhamento entre TI e negócios e governança de TI na obtenção de valor público a partir de iniciativas de transformação digital. Foi realizado um estudo descritivo-confirmatório por meio de uma pesquisa que abrangeu 1.202 servidores públicos brasileiros. Os resultados mostraram que o valor público na transformação digital depende das competências relacionadas à transformação digital, uma vez que é influenciado tanto pelo comportamento dos funcionários públicos (com base no comportamento de cidadania organizacional) quanto pelo alinhamento entre TI e negócios. Os resultados também mostraram que algumas competências gerenciais e de governança são necessárias para que as iniciativas de transformação digital gerem valor público. A principal contribuição teórica residiu no desenvolvimento e na validação do modelo teórico e do instrumento de pesquisa. Além disso, a principal contribuição para as organizações foi a identificação de que algumas condições primárias precisam ser cumpridas nas organizações para iniciar iniciativas de transformação digital.

Palavras-chave: transformação digital, comportamento de cidadania organizacional, alinhamento entre TI e negócios, governança de TI.

Comportamiento de ciudadanía organizacional y alineación estratégica en la generación de valor a partir de la transformación digital

Resumen

La transformación digital es un fenómeno que ha impactado a organizaciones privadas y públicas en diferentes aspectos. En este sentido, el objetivo del artículo es evaluar la asociación entre la competencia en transformación digital, el comportamiento de los servidores públicos, la alineación entre TI y negocios y la gobernanza de TI en la obtención de valor público a partir de iniciativas de transformación digital. Se realizó un

estudio descriptivo-confirmatorio mediante una investigación que abarcó a 1.202 servidores públicos brasileños. Los resultados mostraron que el valor público en la transformación digital depende de las competencias relacionadas con la transformación digital, ya que está influenciado tanto por el comportamiento de los empleados públicos (basado en el comportamiento de ciudadanía organizacional) como por la alineación entre TI y negocios. Los resultados también mostraron que algunas competencias gerenciales y de gobernanza son necesarias para que las iniciativas de transformación digital generen valor público. La principal contribución teórica radicó en el desarrollo y la validación del modelo teórico y del instrumento de investigación. Además, la principal contribución para las organizaciones fue la identificación de que algunas condiciones primarias deben cumplirse en las organizaciones para iniciar iniciativas de transformación digital.

Palabras clave: transformación digital, comportamiento de ciudadanía organizacional, alineación entre TI y negocios, gobernanza de TI.

1. INTRODUCTION

Digital transformation (DT) has been discussed at several levels in private and public organizations. Apart from presenting a not-so-clear concept, it is a current topic and part of many initiatives in numerous private and public organizations. DT ranges from incremental innovations, such as digital services, to disruptive innovations, like changing relationships between actors within a supply or value chain.

DT regards new ways to interact with citizens and other stakeholders in public organizations (European Commission, 2012), mainly in response to administrative inefficiency. The ways government and citizens relate to each other are changing (Cunha & Miranda, 2013), mainly because DT initiatives outside the public sector are transforming peoples' expectations about what a service must deliver (Mergel et al., 2019). Consequently, users' experience with private services shapes their expectations about public services.

Technologies occasionally become the focus of governments rather than the development of new strategies given that they are often made operational through technology. Information Technology (IT) suppliers' influence and difficulties to understand the scope of this concept are the two main reasons for such behavior. IT suppliers sell more technology by promising impressive and easy results. Difficulties

faced by public servants in understanding what exactly sets DT and how to reach some of the promised benefits are elements also playing central role in this process. Takele Koyra et al. (2026) link IT suppliers influence to either DT success or failure. They suggested that stakeholders conceptual understanding and expectations are critical factors to accomplish positive outcomes. Kitsios et al. (2023) emphasized that technological transition without clear understanding by managers reduces the effectiveness of DT initiatives.

DT is understood as the use of digital technologies in a wide range of innovations (Gao, 2026; Hinings et al., 2018; Omol et al., 2024). It regards developing new strategies made feasible by new digital technologies aimed at improving processes and reshaping the relationship between government and citizens. Despite the different DT approaches, two conditions need to be observed in organizations, namely: collaborative teams and good alignment between IT and business areas represented by the middle ones and by areas closely connected to services provided to citizens. These two aspects can be even more critical in public organizations as public servants have more discretionary power to adhere, or not, to new initiatives. IT projects can be conducted in semi-autonomous public organizations. More collaborative public servants could help increasing public value generation through DT because they can develop more initiatives and focus on citizens' well-being, rather than on internal power disputes. Business and IT teams tend to achieve mutual results, rather than to compete for leading IT projects when they share a vision of their organizations, e.g., strong IT-business alignment. IT governance is necessary to generate IT-business alignment (Ross et al., 2006) and to help achieving a more collaborative work (Wiedenhöft et al., 2019).

The aim of this study is to assess the association among DT competence, public servant behavior, IT-business alignment and IT governance within the process to achieve public value generation based on DT initiatives. A theoretical model was developed and validated through a quantitative study carried out at state-level government in Brazil.

The article is divided into five sections. This introduction, which provides the study motivations, the research problem and its aims. Section 2, which addresses the theoretical elements orienting the study and the process to design the theoretical model. Section 3 describes how the study became operational. Section 4 introduces the data analysis and Section 5 provides the concluding remarks.

2. THEORETICAL BACKGROUND AND CONCEPTUAL MODEL

This section provides the theoretical background related to the main concepts linked to the addressed topic, as well as sets a conceptual model to be further tested, as shown in Section 4.

2.1 Competencies driving digital transformation and public value generation

The public value paradigm is seen as essential for the public administration to overcome new public management concepts and to focus on what is best for all stakeholders. There is a call for not only focusing on economic variables and individual choices typical of the private sector, but on social and political dimensions and on collective preferences, as highlighted in the public value paradigm (Cordella & Bonina, 2012). Therefore, any DT initiative can only be significant, or even necessary, if it creates some value for citizens and stakeholders. Public value leads to the sense of more open governments not focused on internal issues, but dedicated to people's needs (Hilgers & Ihl, 2010).

The concept of public value is vital for avoiding unnecessary initiatives likely resulting from IT suppliers' pressure in DT terms. It is crucial understanding public value addition to DT initiatives. Competencies held by government teams play core role in public value generation because IT suppliers will lead DT initiatives, if public servants are unable to do so. Drejer (2002) stated that these competencies are grouped into four types, namely: individual, group, intra-organizational and inter-organizational.

The following hypothesis were proposed based on the discussion above:

H1: Digital transformation-related competencies have positive influence over public value generation driven by digital transformation initiatives.

2.2 Collaborative behavior and competencies driven by business-IT alignment competencies

The process to develop competences requires collaborative attitude focused on making the necessary efforts to achieve high-level goals within organizations. The concept of Organizational Citizenship Behavior (OCB) was employed to understand the collaborative behavior. Hinings et al. (2018) mentioned that OCB described a person's

voluntary commitment to an organization, which would exceed its contractual tasks. OCB takes place when employees undertake actions intended to safeguard these organizations and everything belonging to them. All these actions lead to favorable organizational environments.

Similarly, It-business alignment drives competencies related to digital transformation. However, these competencies require a good understanding of the organization as a whole. A clear expression of links set between business and IT strategies helps determining the explored competences and opens room for the synergy bonding these two fields.

Business strategies are becoming progressively dependent on IT as organizations digitize their processes and build digital options to explore future opportunities (Bharadwaj et al., 2013). Therefore, it implies saying that digital business strategy applications depend on organizations' ability to achieve IT leverage through business processes. In this case, two-way alignment becomes a central mechanism allowing IT to create value (Coltman et al., 2015). Some specific competencies are necessary in both situations to properly use benefits emerging from the synergy between IT and business, and vice versa.

The proactive behavior of public servants and IT-business alignment, altogether, play critical role in finding the individual and organizational competencies necessary for public value generation based on digital transformation initiatives. OCB and IT-business alignment represent the individual and organizational measures demanded to develop some competencies seen as essential to better understand the organization and its ecosystem in a broader way.

The following hypotheses were proposed based on the discussion above:

H2: Organizational citizenship behavior has positive influences on the development of digital transformation-related competences.

H3: IT-business alignment has positive influence on the development of digital transformation-related competences.

2.3 IT Governance driving organizational citizenship behavior and IT-business alignment

IT governance (ITG) holds a set of organizational arrangements and authority patterns for strategic IT activities (Sambamurthy & Zmud, 1999). These arrangements comprise different structures, processes and relationship mechanisms (Weill & Ross, 2004) representing the practical operational application of ITG's high-level definitions (Wiedenhöft et al., 2017). Actually, ITG includes decision-making rights and the responsibility for encouraging desirable IT-related behavior (Mendonça et al., 2013) and IT strategic use in organizations. Good governance regards transparency, mainly concerning decision-making processes; authority and accountability to deal with public sector assets (Juiz et al., 2014). It also improves organizational IT agility by meeting peripheral knowledge on IT units and line functions (Tiwana & Kim, 2015). Important insights into the nature of public administration at its operational level is also a response to ITG strategies because it provides on both public policies conduction and on the performance of public governance everyday tasks (Goldkuhl, 2016).

Several authors have highlighted the connection between IT governance and IT-business alignment. Ross et al. (2006) mentioned that IT-business alignment is one of the mutually interdependent ITG components.

Wiedenhöft et al. (2019) suggested that ITG acts in OCB's antecedents, such as job satisfaction and perception of rewards. The behavior of public servants improves when they have clear understanding of what is expected in an IT governance process. OCB helps developing the necessary competencies for public value generation based on digital transformation initiatives, but IT governance processes, structures and relationships influence OCB.

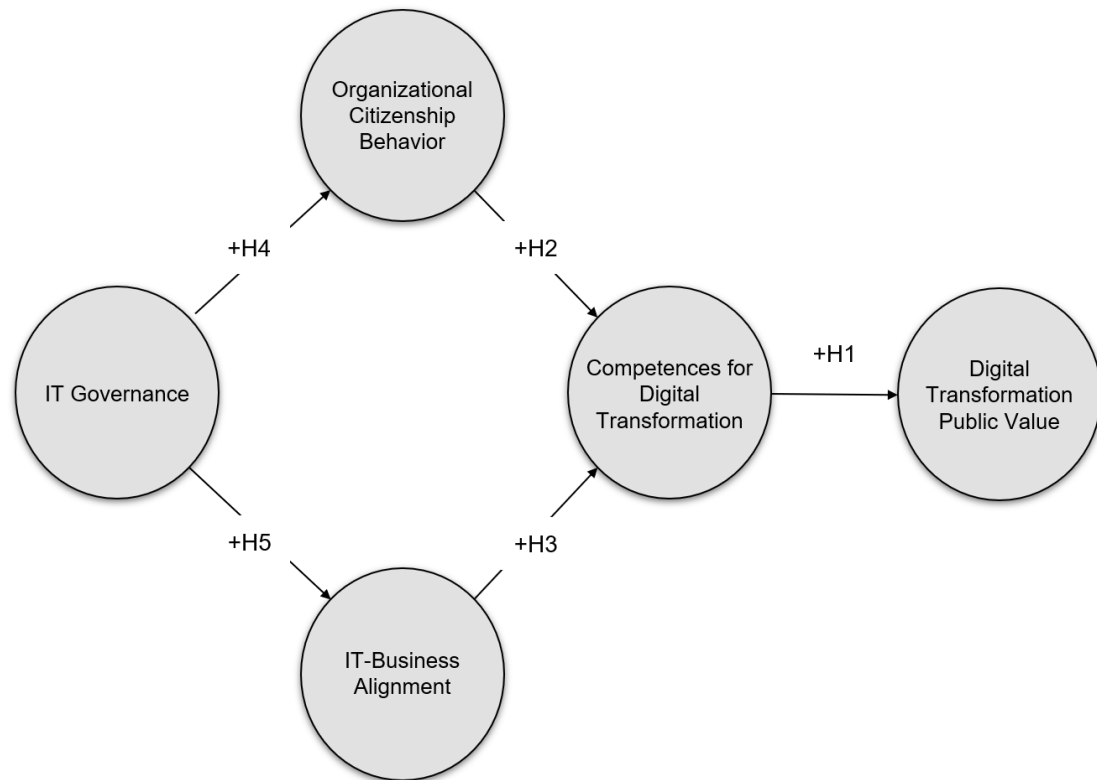
The following hypotheses were proposed based on the discussion above:

H4: IT governance mechanisms have positive influence over organizational citizenship behavior.

H5: IT governance mechanisms have positive influence over IT-business alignment.

The theoretical model is illustrated in Figure 1.

Figure 1. Theoretical model



Source: Elaborated by the authors.

3. RESEARCH METHOD

3.1 Research design and instrument

Functionalist epistemological research approach was adopted to help better understand society and produce knowledge to be applied in organizations (Hassard, 1991). The study followed a descriptive-confirmatory design focused on quantitative methods (Venkatesh et al., 2013). The theoretical model was supported by five variables, namely:

a) IT governance effectiveness determined by maturity level mechanisms (Luciano et al., 2016) and performance based on stakeholders' perception (Weill & Ross, 2004);

b) Organizational citizenship behavior as discretionary behavior fraction apart from the job description, although it improves organizational outcomes and performance (Rego & Cunha, 2010; Wiedenhöft et al., 2019);

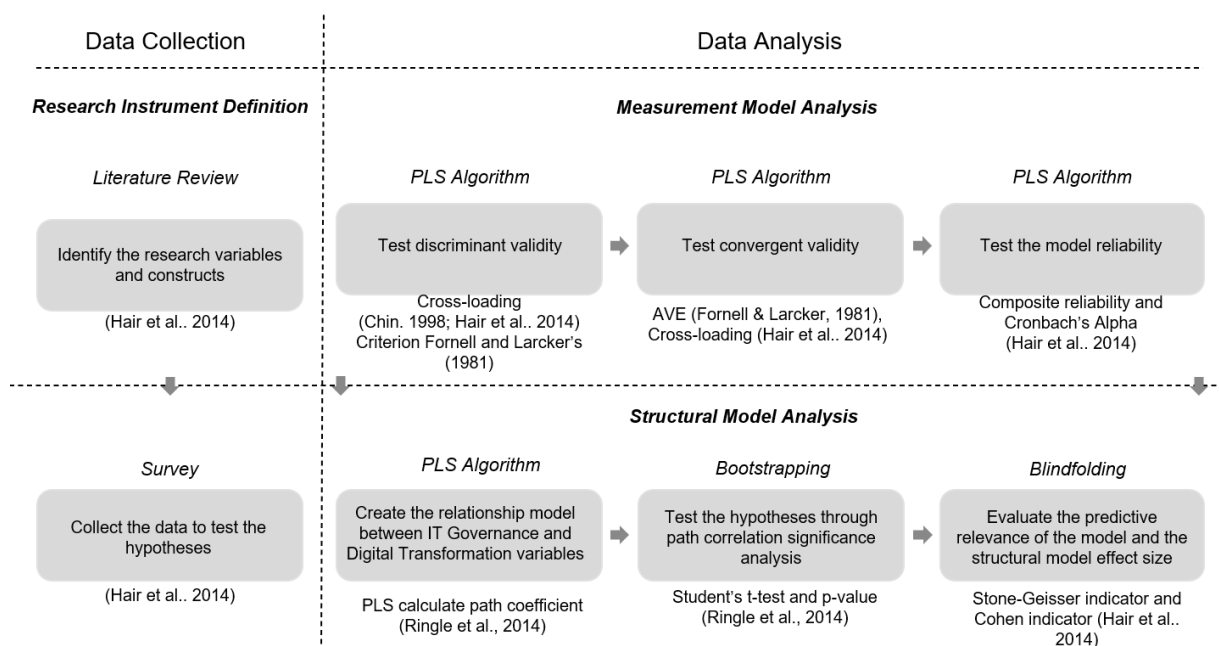
c) IT-business alignment understood as the level allowing IT use to reach the business goals and generate better results based on digital transformation strategies (Kane et al., 2015);

d) Digital transformation competencies are necessary to conceive digital transformation initiatives (Hassard, 1991) and to benefit from innovation (Hinings et al., 2018);

e) The public value of digital transformation represents the benefits coming from digital transformation initiatives to favor citizens and society as a whole (Cordella & Bonina, 2012; Luciano et al., 2016).

The Figure 2 depicts the herein applied procedures and techniques.

Figure 2. Research scheme



Source: Elaborated by the authors.

A questionnaire was elaborated to guide the survey after the research variables and constructs were proposed (Hair et al., 2014). The survey was conducted with high-level managers involved in digital transformation-related initiatives at state level.

The questionnaire was divided into two parts. The first one consisted in 46 questions designed to measure different aspects. The second one comprised 11 socio-demographic questions. Table 1 provides variables' operational applications.

3.2 Survey Data collection

In total, 3.220 survey instruments were fulfilled. Respondents represented Digital Transformation and e-government associated fields, such as IT governance, IT strategy, business analysis, institutional governance, services for citizens and strategy. Data purification was conducted through the method by Sarstedt et al. (2014). Incomplete questionnaires, or those with 75% or more repeated answers, were disregarded. There were 1.202 valid cases at the end of the data purification procedure. Respondents' profile is introduced in Table 1.

Table 1. Respondents' profile

Educational level	YEARS OF PROFESSIONAL EXPERIENCE				
	Up to 3	3-5	5-8	More than 8	Total
Ph.D.	3	3	4	11	21
Master's degree	25	18	21	124	188
MBA	59	55	71	401	586
Bachelor's degree	72	58	54	223	407
Total	159	134	150	759	1,202

Source: Elaborated by the authors.

Brazilian states are at different maturity stages of IT governance and IT-business alignment, digital transformation and public value delivery to citizens. Therefore, it allowed ensuring the necessary variance to make the model operational and to test the hypotheses.

The Kolmogorov-Smirnov test did not enable determining sample normality. Consequently, data analysis depended on estimating structural equations through partial least squares (SEM-PLS) (Hair et al., 2014; Koufteros, 1999).

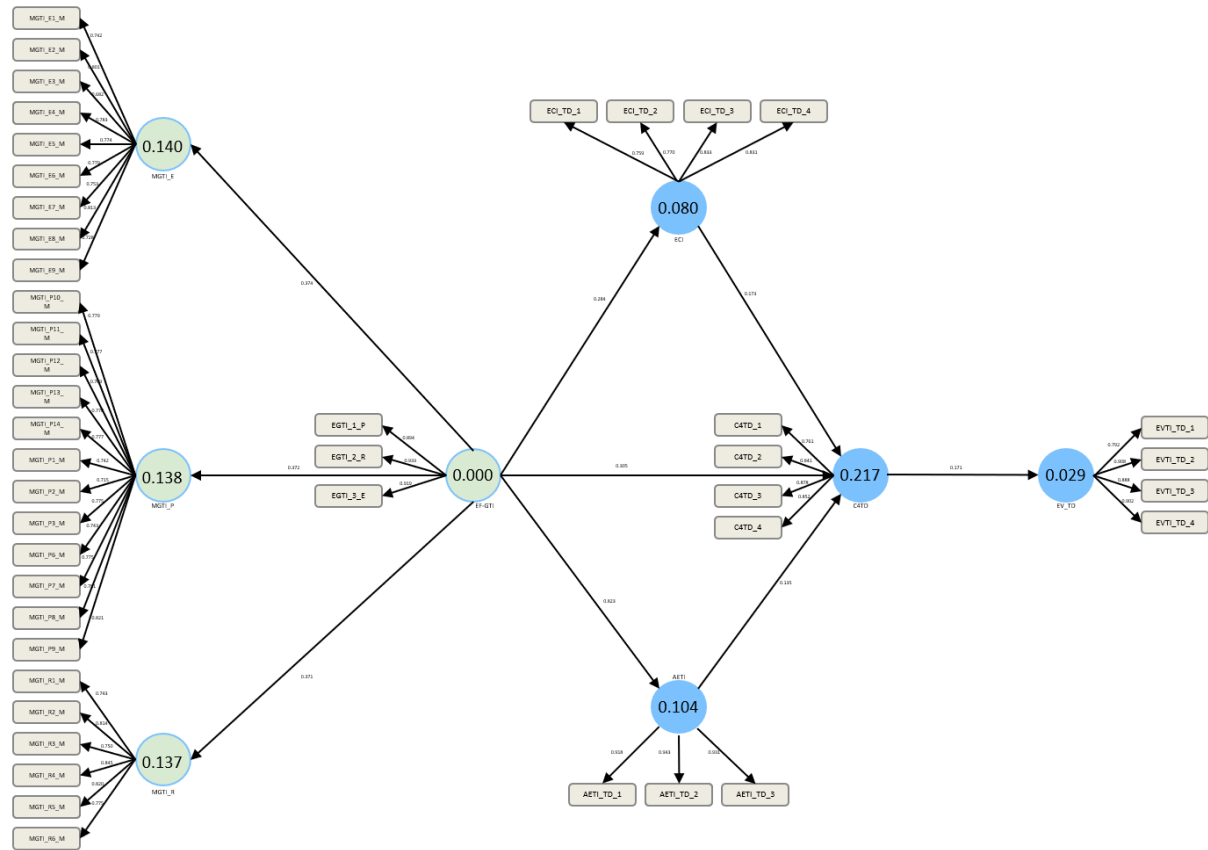
3.3 Data analysis

3.3.1 Measurement-model analysis

The PLS algorithm module was configured for the path weighting scheme based on recommendations by Ringle et al. (2014) as soon as model designing was concluded. The following parameters were adopted: mean = 0, standard deviation = 1, maximum number of rotations to achieve model convergence = 300, and abort criterion for changes below

0.00001. Finally, calculation results were generated and interpreted in report software. Figure 3 depicts the model of constructs in Smart-PLS software.

Figure 3. Theoretical model



Source: Elaborated by the authors.

The measurement-model analysis started from assessing the discriminant validity, which was obtained as latent constructs or variables independent from each other (Sarstedt et al., 2014). Cross-loadings between observable variables and their factors were perceived, based on Ringle et al. (2014). Table 2 presents the discriminant validity test based on cross-loading analysis (Chin, 1998).

Table 2. Discriminant validity – Cross-loading analysis

	AETI	C4TD	ECI	EF_GTI	EV_TD	MGTI_E	MGTI_P	MGTI_R
AETI_TD_1	0.916	0.320	0.397	0.312	0.312	0.291	0.307	0.302
AETI_TD_2	0.941	0.321	0.427	0.347	0.282	0.288	0.289	0.310
AETI_TD_3	0.929	0.323	0.421	0.343	0.300	0.304	0.310	0.326
C4TD_1	0.240	0.762	0.278	0.312	0.169	0.264	0.263	0.260
C4TD_2	0.284	0.843	0.284	0.314	0.182	0.306	0.316	0.301
C4TD_3	0.311	0.877	0.298	0.356	0.141	0.363	0.379	0.368

	AETI	C4TD	ECI	EF_GTI	EV_TD	MGTI_E	MGTI_P	MGTI_R
C4TD_4	0.315	0.852	0.322	0.348	0.150	0.352	0.364	0.367
ECI_TD_1	0.293	0.259	0.750	0.201	0.188	0.247	0.245	0.245
ECI_TD_2	0.326	0.241	0.768	0.190	0.182	0.212	0.206	0.233
ECI_TD_3	0.425	0.315	0.834	0.306	0.179	0.315	0.323	0.351
ECI_TD_4	0.361	0.300	0.825	0.276	0.103	0.311	0.323	0.353
EGTI_R_1	0.311	0.362	0.264	0.895	0.164	0.338	0.337	0.337
EGTI_R_2	0.348	0.373	0.314	0.932	0.148	0.341	0.344	0.337
EGTI_R_3	0.329	0.361	0.287	0.918	0.182	0.364	0.351	0.355
EGTI_R_4	0.328	0.363	0.280	0.911	0.148	0.329	0.330	0.337
EVTI_TD_1	0.279	0.155	0.183	0.148	0.795	0.093	0.103	0.106
EVTI_TD_2	0.290	0.171	0.164	0.157	0.913	0.075	0.066	0.071
EVTI_TD_3	0.272	0.162	0.181	0.139	0.892	0.095	0.078	0.074
EVTI_TD_4	0.281	0.180	0.177	0.170	0.898	0.100	0.091	0.112
MGTI_E1_M	0.295	0.320	0.309	0.294	0.084	0.746	0.652	0.640
MGTI_E2_M	0.276	0.293	0.278	0.303	0.087	0.800	0.725	0.707
MGTI_E3_M	0.215	0.263	0.241	0.293	0.123	0.680	0.612	0.570
MGTI_E4_M	0.228	0.264	0.224	0.280	0.041	0.782	0.697	0.717
MGTI_E5_M	0.199	0.288	0.243	0.243	0.036	0.771	0.732	0.738
MGTI_E6_M	0.197	0.308	0.242	0.248	0.021	0.776	0.702	0.717
MGTI_E7_M	0.278	0.325	0.298	0.321	0.143	0.755	0.714	0.675
MGTI_E8_M	0.240	0.306	0.258	0.301	0.053	0.813	0.736	0.697
MGTI_E9_M	0.224	0.275	0.276	0.269	0.099	0.728	0.616	0.579
MGTI_P10_M	0.228	0.288	0.251	0.279	0.063	0.710	0.777	0.654
MGTI_P11_M	0.272	0.332	0.262	0.279	0.082	0.713	0.776	0.716
MGTI_P12_M	0.226	0.286	0.226	0.267	0.105	0.591	0.709	0.559
MGTI_P13_M	0.219	0.317	0.265	0.276	0.019	0.663	0.768	0.698
MGTI_P14_M	0.244	0.329	0.288	0.283	0.052	0.699	0.775	0.720
MGTI_P1_M	0.320	0.305	0.295	0.344	0.115	0.687	0.739	0.661
MGTI_P2_M	0.242	0.256	0.255	0.236	0.051	0.595	0.710	0.629
MGTI_P3_M	0.261	0.282	0.282	0.268	0.036	0.706	0.775	0.690
MGTI_P6_M	0.251	0.307	0.291	0.328	0.120	0.688	0.741	0.669
MGTI_P7_M	0.236	0.312	0.269	0.275	0.092	0.684	0.776	0.681
MGTI_P8_M	0.226	0.315	0.259	0.264	0.090	0.743	0.781	0.707
MGTI_P9_M	0.227	0.304	0.265	0.277	0.036	0.764	0.820	0.760
MGTI_R1_M	0.285	0.294	0.332	0.313	0.118	0.633	0.660	0.738
MGTI_R2_M	0.330	0.287	0.314	0.317	0.080	0.711	0.706	0.812
MGTI_R3_M	0.229	0.298	0.267	0.269	0.065	0.710	0.687	0.747
MGTI_R4_M	0.261	0.337	0.301	0.306	0.053	0.734	0.743	0.843
MGTI_R5_M	0.213	0.319	0.286	0.287	0.075	0.719	0.704	0.819
MGTI_R6_M	0.267	0.317	0.292	0.268	0.099	0.662	0.723	0.773

Source: Elaborated by the authors.

Table 2 provides the indicators accounting for higher factor loadings in their respective latent variables or constructs in comparison to others. Chin (1998) stated that this finding confirms the measurement model discriminant validity based on the cross-loading criterion. The square roots of average variance extracted (AVE) from each latent variable were compared to the other latent variables through Pearson's correlations. AVE square roots had to be larger than the correlations between constructs, based on the Fornell and Larcker's (1981) criterion. Table 3 provides the discriminant validity test based on the Fornell and Larcker's (1981) criterion.

Table 3. Discriminant validity

AETI	C4TD	ECI	EF_GTI	EV_TD	MGTI_E	MGTI_P	MGTI_R
0.929							
0.308	0.949						
0.431	0.316	0.795					
0.323	0.397	0.281	0.914				
0.312	0.171	0.197	0.160	0.876			
0.289	0.382	0.310	0.374	0.091	0.762		
0.296	0.394	0.314	0.372	0.085	0.604	0.763	
0.305	0.385	0.337	0.371	0.090	0.681	0.692	0.790

Source: Elaborated by the authors.

Table 3 shows the model with discriminant validity. Items highlighted in bold represent the square root of the AVE scores. The square roots of latent variables' AVE were larger than the correlations recorded for the same variables and other latent variables of the model, which were in compliance with both Fornell and Larcker's (1981) and cross-loading criteria (Chin, 1998).

The values were found after confirming the discriminant validity to determine convergent validity (AVE values), internal consistency, Cronbach's alpha (CA) and composite reliability (CR), as depicted in Table 4.

Table 4. Convergent validity and internal model consistency

Latent Variables	AVE*	Composite Reliability	Cronbach's Alpha	Communality
AETI	0.863	0.950	0.921	0.863
C4TD	0.697	0.902	0.854	0.697
ECI	0.632	0.873	0.808	0.632
EF_GTI	0.836	0.953	0.934	0.836
EV_TD	0.767	0.929	0.898	0.767

MGTI_E	0.581	0.926	0.909	0.581
MGTI_P	0.582	0.943	0.935	0.582
MGTI_R	0.624	0.908	0.879	0.624
Reference Values	AVE > 0.50	CR > 0.70	AC > 0.70	COM > 0.5

*Average variance extracted from the principal constructs.

Source: Elaborated by the authors.

Data in Table 4 allowed determining convergent validity and internal consistency. The measurement model suited the aim of this study and enabled testing the research hypotheses.

3.3.2 Structural model analysis

Calculating Pearson's coefficient of determination (R^2 value) was the first step of this new research stage (Ringle et al., 2014). Table 5 presents the Pearson's coefficient of determination (R^2) values.

Table 5. Coefficients of determination (R^2)

Latent Variables	R Square
AETI	0.130
C4TD	0.236
ECI	0.098
EF_GTI	0.151
EV_TD	0.037

Source: Elaborated by the authors.

Hair et al. (2014), $R^2 > 0.02$, $R^2 > 0.13$ and $R^2 > 0.26$ considered these values small, medium and large, respectively, based on social and behavioral sciences data.

All the tests conducted so far have confirmed the proposed model's suitability, since it allowed testing the hypotheses. T-statistics was calculated by using original data values and values obtained through the resampling technique conducted in the bootstrapping module of the Smart-PLS software. Table 6 shows the effects and significance of associations between IT governance institutional variability and organizational citizenship behavior.

Table 6. Associations' Significance test

	Original Sample	Sample Mean	Standard Deviation	Standard Error	T Statistics	P-Value
C4TD -> EV_TD	0.191	0.192	0.020	0.020	9.696	***
ECI -> C4TD	0.196	0.196	0.019	0.019	10.224	***
AETI -> C4TD	0.157	0.157	0.018	0.018	8.642	***
EF_GTI -> ECI	0.314	0.314	0.017	0.017	18.043	***
EF_GTI -> AETI	0.360	0.360	0.017	0.017	21.320	***
EF_GTI -> C4TD	0.399	0.400	0.019	0.019	20.671	***
MGTI_E -> EF_GTI	0.151	0.151	0.033	0.033	4.626	***
MGTI_P -> EF_GTI	0.106	0.107	0.033	0.033	3.193	***
MGTI_R -> EF_GTI	0.146	0.146	0.032	0.032	4.579	***

Source: Elaborated by the authors.

The t-test values were higher than 1.96, and it corresponded to $p < 0.05$. Ringle et al. (2014) agreed that this finding confirmed the significance of the identified associations. Values ranging from -1.96 to +1.96 corresponded to 95% probability in normal distribution, and those outside this range corresponded to 5% probability. Finally, predictive validity was assessed through Stone-Geisser indicator (Q^2) and the effect size was assessed through Cohen indicator (f^2). Table 7 presents the values recorded for the Stone-Geisser (Q^2) and Cohen (f^2) indicators.

Table 7. Model predictive validity and construct effects

Latent variable	Stone-Geisser (Q^2)	Cohen (f^2)
AETI	0.679	0.111
C4TD	0.488	0.161
ECI	0.388	0.060
EF_GTI	0.704	0.123
EV_TD	0.599	0.025
MGTI_E	0.475	0.475
MGTI_P	0.501	0.501
MGTI_R	0.469	0.469

Source: Elaborated by the authors.

The Q^2 indicator was employed to assess the quality of model predictions and the accuracy of the adjusted model. Sarstedt et al. (2014) suggested that digital transformation values higher than zero confirmed the adjusted model's accuracy. Subsequently, the f^2 indicator was assessed to determine how the construct contributed to model adjustments.

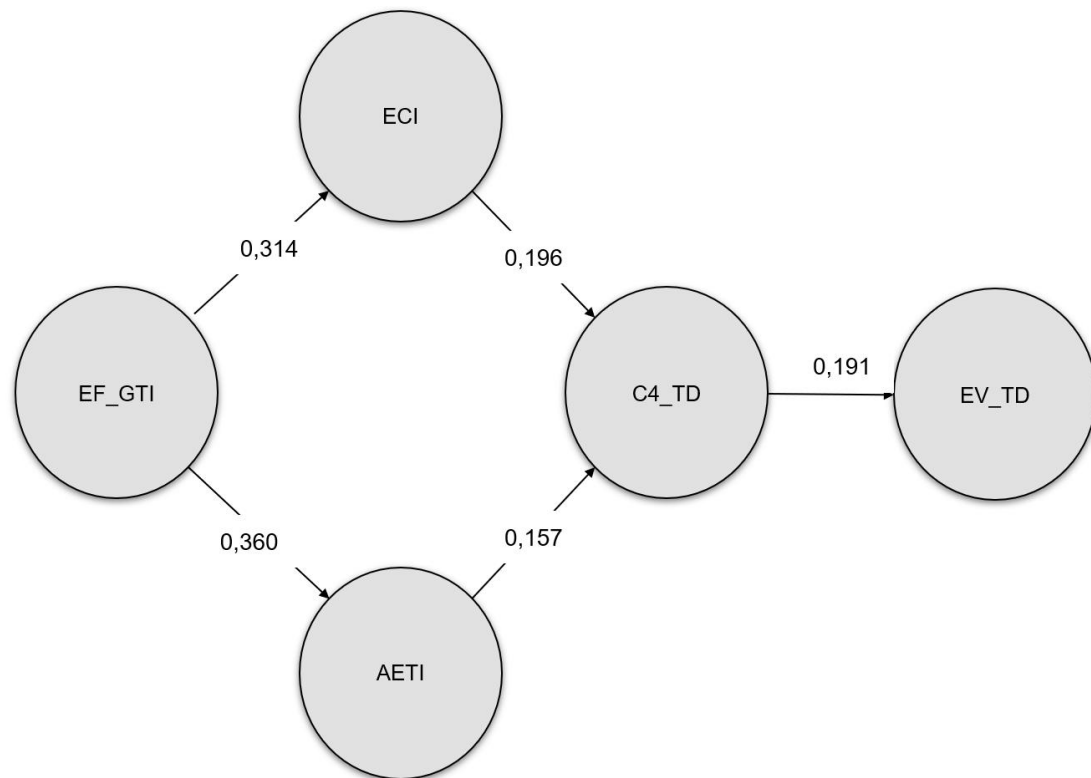
Sarstedt et al. (2014) showed that digital transformation, $f^2 > 0.02$, $f^2 > 0.15$ and $f^2 > 0.35$ were small, medium and large values, respectively. Thus, it was possible determining that all constructs were important for the model's fit. The following section discusses the results recorded for the tested hypotheses.

4. RESULTS AND DISCUSSION

The digital transformation concept is often attributed to two main perspectives. The first one is somewhat abstract and usually regards the diffuse idea of non-specific disruptive innovation in private and public organizations. It brings along the sense of outstanding potential results, but still, it is a bit vague. The second perspective is more concrete and often concerns services and platforms' digitalization, as well as changes in the interface between service providers and citizens, or other stakeholders. Closer attention must be given to changes in organizational culture or structures. It must be done to develop a culture of faster actions or to achieve a less formal structure by using digital technologies (Mergel et al., 2019). Aspects related to information technology present an attractive but unrealistic idea of what digital transformation is. This understanding ends up confusing public servants and distracting them from problems that really need to be solved. This statement is justified by the variables playing a critical role in digital transformation, mainly with regard to the likely creation of public value as a consequence of it.

The aim of this study was to assess the association among digital transformation competence, public servant behavior, IT-business alignment and IT governance in achieving public value based on digital transformation initiatives. All five hypotheses in the theoretical model were confirmed. This is presented in Figure 4.

Figure 4. Theoretical model



Source: Elaborated by the authors.

Hypothesis *H1: Digital transformation-related competencies have positive influence over public value generation driven by digital transformation* suggested that the association between digital transformation skills and public value generation is consistent, at least, in theoretical terms. The association was also consistent when it was empirically tested. However, there were aspects that should be closely observed. Although digital transformation-related competencies had positive influence over public value generation, there was also dependence on institutional contexts, organizations' digital maturity and public value perception. In other words, the presence of digital transformation competencies alone does not ensure value generation. This is so because political, regulatory and cultural factors can limit these competencies' conversion into concrete benefits for citizens.

Hypothesis *H2: Organizational citizenship behavior has positive influence over the development of digital transformation-related competences* suggested that the organizational citizenship behavior tends to strengthen learning and innovation orientation, which are essential elements for digital competencies development. This influence may be limited by strict organizational structures or inadequate incentives

capable of inhibiting proactive behaviors, even in contexts favorable to digital transformation.

Hypothesis *H3: IT-business alignment has positive influence over the development of digital transformation-related competences* confirmed that IT-business alignment is a fundamental aspect for integrating strategic objectives and developing technological capability by providing the right conditions for digital transformation skills' development. Achieving such alignment can be challenging, mainly when it comes to public organizations whose political priorities and budget constraints can hinder the convergence of technical and organizational fields.

Hypothesis *H4: IT governance mechanisms have positive influence over organizational citizenship behavior* suggested that effective IT governance mechanisms can enable more transparent, participatory and result-oriented environments. Consequently, they would favor organizational behaviors. However, governance mechanisms can have the opposite effect, i.e., limiting and reducing citizens' autonomy and motivation, if they get too bureaucratic or overly focused on control.

Hypothesis *H5: IT governance mechanisms have positive influence over IT-business alignment* clarified that IT governance plays a fundamental role in aligning IT and business. IT governance is a core element to promote the IT-business alignment by defining structures, decision-making processes and communication mechanisms. However, its effectiveness depends on its ability to adapt to organizational and technological changes. Extremely normative and strict governance models can compromise its alignment with reality, mainly its fast evolution in digital environments.

Overall, value creation requires the development of some competencies that, in turn, need individual and organizational measures, namely: organizational citizenship behavior and IT-business alignment. Individuals presenting low OCB tend to have regular performance in their activities as they avoid risks related to innovation processes linked to digital transformation. Competencies also need proper IT-business alignment levels because digital transformation competencies are known for their multidisciplinary profile and for demanding cross-areas. It is difficult to develop these competencies without any collaborative work and shared visions since the environment gets aseptic under traditional departmental limits. Effective IT governance mechanisms like processes, structures and relationships were identified as necessary conditions to reach proper OCB levels and IT-business alignment.

Based on the carried out analysis, the need for broadening the concept of digital transformation and for working on aspects necessary for generating value through its application are among the main findings in this study. Such understanding helps to avoid problems like (i) narrow view of digital transformation, which, in turn, can lead to biased decisions in favor of information technology solutions, rather than to public value generation for citizens; (ii) excessive dependence on information technology providers to make available solutions to problems that, in some cases, are related to digital transformation, but not strictly related to its technical aspects; (iii) an unrealistic perspective of citizens' digital inclusion and digital literacy without taking into account the difficulties to access applications, or in its broadest form, the entire information technology infrastructure – Janowski (2015) stated that the digital space is “amplifying existing division, inequality, exclusion, fraud, insecurity, power imbalance problems, and many others”; (iv) focus on information technology technical aspects, rather than on their potential for real contribution.

5. CONCLUSION

This study investigated the association among digital transformation competence, public servant behavior, IT-business alignment and IT governance in generating public value based on digital transformation initiatives. The theoretical-empirical model was tested through structural equation modeling in Smart-PLS. The measurement model analysis confirmed the discriminant validity and suggested that the constructs were independent from each other, based on the Fornell and Larcker's cross-loading criteria. In addition, it should be noted that convergent validity and internal consistency were ensured by the recorded average variance extracted (AVE), Cronbach's Alpha and Composite Reliability values. Quality indicators such as the coefficient of determination (R^2), the Stone-Geisser indicator (Q^2) for predictive validity and the Cohen's indicator (f^2) for effect size indicated that all constructs were fundamental to the model fit and accuracy.

The empirical results confirmed the five hypotheses put forward in the theoretical model. The core association between digital transformation skills and public value generation (H1) was confirmed, although the analysis indicated that it was not isolated. This outcome intrinsically depended on the institutional context it took place in, on the organization's digital maturity and on the perception about the generated value. Yet,

political and cultural factors can act as limiting elements in turning such competencies into real benefits for citizens.

The study also clarified that the organizational citizenship behavior (OCB) has positive influence over the development of digital competencies (H2) for strengthening learning and innovation orientation. However, strict structures could inhibit proactive behaviors. Similarly, IT-business alignment proved to be fundamental for strategic goals (H3) integration because it provides the necessary conditions for technological capability development and strengthening. It should be observed that such alignment still faces barriers imposed by budgetary constraints in the public sector.

The role of IT governance has been having positive influence over both organizational citizenship behavior (H4) and IT-business alignment (H5). Effective governance mechanisms promote transparent and participatory environments, although extremely strict and prescriptive models tend to have the opposite effect as they reduce citizens' autonomy and motivation. Overall, IT governance defines the communication structures and processes necessary for organizational citizenship behavior (OCB) and IT-business alignment to reach adequate levels.

Broadly speaking, this research proved that digital transformation in the public sector is still a complex phenomenon because IT governance acts as agent helping to promote and balance proactive behavior and strategic organizational alignment, which, in turn, strengthens the demanding skills to generate public value. The results highlighted (i) the development of governance mechanisms capable of balancing control and citizen autonomy, and (ii) the prioritization of public value generation and digital inclusion (digital literacy, IT infrastructure, among others). The recorded levels values IT and digital transformation mere technical aspects that must be observed at the time to create an integrated model aimed at turning technology into concrete benefits for citizens.

This study provided practical implications for professionals in the government and theoretical contributions to scholars and professionals in digital transformation, and related fields, if one bears in mind the thoroughness of this theoretical background. It contributed to the specific literature in three distinct ways. First by developing and validating a theoretical model to explain some variables considered digital transformation predictors capable of enabling public value. Second by developing and validating a research instrument (questionnaire). Third by allowing the best understanding of and describing digital transformation phenomena.

Results generation was another study limitation because data were collected at state government level. Assumingly, different organizational and cultural contexts can generate different results. Thus, results extrapolation should respect the features and limitations of cases represented by different data collection techniques.

The developed and validated model must be further applied to other public and private organizations, in different contexts, to improve its understanding. Future studies can likely test whether the factorial structure and the confirmed associations remain significant. They could also compare these results to those in studies focused on assessing the effects of barriers on digital transformation competences. In addition, a cluster analysis could be used to create groups of respondents from different states in the country and to compare their social-technical-political aspects.

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Edimara Mezzomo Luciano

ORCID: <https://orcid.org/0000-0002-2847-8845>

Ph.D. in Business Administration and Professor at the Pontifical Catholic University of Rio Grande do Sul, Graduate Program in Business Administration. E-mail: eluciano@pucrs.br

Guilherme Costa Wiedenhöft

ORCID: <https://orcid.org/0000-0003-2426-4396>

Ph.D. in Business Administration and Professor at the Federal University of Rio Grande. Graduate Program in Business Administration. E-mail: wiedenhofst@furg.br

Mônica Fitz-Oliveira

ORCID: <https://orcid.org/0000-0002-3028-138X>

Ph.D. in Business Administration and Researcher at the Federal University of Rio Grande. Graduate Program in Business Administration. E-mail: monica.fitz.oliveira@furg.br

AUTHORS' CONTRIBUTION

Edimara Mezzomo Luciano: Conceptualization (Equal); Data curation (Supporting); Formal Analysis (Supporting); Investigation (Supporting); Methodology (Equal); Project administration (Lead); Resources (Equal); Software (Supporting); Supervision (Lead); Validation (Equal); Visualization (Supporting); Writing - original draft (Equal); Writing - review & editing (Equal).

Guilherme Costa Wiedenhöft: Conceptualization (Equal); Data curation (Lead); Formal Analysis (Lead); Investigation (Equal); Methodology (Equal); Project administration (Supporting); Resources (Supporting); Software (Lead); Supervision (Supporting); Validation (Supporting); Visualization (Supporting); Writing - original draft (Equal); Writing - review & editing (Equal).

Mônica Fitz-Oliveira: Conceptualization (Supporting); Data curation (Supporting); Formal Analysis (Supporting); Investigation (Equal); Methodology (Supporting); Project administration (Supporting); Resources (Equal); Software (Supporting); Supervision (Supporting); Validation (Equal); Visualization (Supporting); Writing - original draft (Supporting); Writing - review & editing (Equal).

RESEARCH DATA AVAILABILITY

The entire dataset supporting the results of this study was made available in Mendeley Data and can be accessed in <https://data.mendeley.com/datasets/5sx796yf3h/2>.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

ARTIFICIAL INTELLIGENCE USAGE

The authors declare no artificial intelligence tools were used.

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