The Interaction Between Digital Transformation and Organizational Culture in Society 5.0 Structuring in Turkey

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ABSTRACT

This research aims to explore the interaction between digital transformation and organizational culture in the Society 5.0 structuring in Turkey. The study's sample comprises business owners, senior managers from medium and large enterprises, academicians, and public employees, selected through purposeful sampling methods. Employing an explanatory-sequential design of mixed methods, data collection involved conducting surveys among these distinct sample groups. The quantitative analysis component of this study incorporates exploratory factor analysis, confirmatory factor analysis, correlation analysis, and Structural Equation Modeling (SEM). In the qualitative analysis section, the content analysis method was employed to pose semi-structured questions during interviews with 46 individuals. Code relationship analysis was applied to the data. All data were analyzed using SPSS 25, AMOS 24, and MAXQDA 20 software. According to the results of the quantitative study, digital transformation and organizational culture have a mutual influence. This influence is visible at all levels, with all dimensions and subdimensions influencing one another. On the other hand, the qualitative analysis demonstrated that Society 5.0 and its sub-dimensions influence both digital transformation and organizational culture, as well as their sub-dimensions. Furthermore, it was determined that understanding Society 5.0 necessitates digital transformation as well as a shift in organizational culture. Finally, organizations need to consider the developments within the scope of Society 5.0 and change their organizational structures accordingly.

In recent times, the advent of new digital technologies, particularly within the business sector, has compelled employees and organizations in all sectors to embrace the latest technological

developments if they are to maintain a competitive edge (Alnuaimi et al., 2022; Olsson et al., 2024). As a result of technological developments, economic and socio-cultural developments and changes are taking place all over the world. Along with the cultural changes, organizational cultures, which are subcultures, also undergo some changes and transformations. Many business concepts, especially business processes, are changing. It has emerged that keeping up with developing technologies is a mandatory condition for organizations to survive and compete (Adejare et al., 2022). Additionally, initiatives for digitalization and transformation have advanced quickly and significantly in recent years. Governments, organizations, and even entire nations are undergoing change and transition as they present their ideas for the digital age. Technology advancements like automation, artificial intelligence, the internet of things, and machine learning are progressively showing how beneficial they are to businesses and societies in daily living. This procedure is known as a socio-technical process. The development and deepening of internet connectivity, as well as the virtual world, highlight the enormous contribution that digitalization has made to manufacturing and a wider range of societal and commercial challenges. Digitalization and digital transformation give rise to the formation of a "digital society" in which all stakeholders of society are involved. The notion of a super smart society, also known as Society 5.0, is based on the latest technical breakthroughs and digital innovations brought forth by Industry 4.0 (Alojaiman, 2023). It is an approach that aims to enhance the well-being of individuals, businesses, societies, and governments in general. The Japanese first introduced this idea with a unique cultural structure and specific challenges in a highly technologically advanced context. The idea of "Society 5.0" includes the fusion of virtual and physical places as well as social and cultural changes. Digital transformation and organizational culture are two key ideas for the change brought about by Society 5.0. These ideas are the main emphasis of this study's investigation of Society 5.0. Most of the current studies on digital transformation focus on technology and management, with the sociological component being largely disregarded (Kraus et al., 2022; Rutihinda, 2019). The present study examines the relationship between organizational culture and digital transformation, with a particular focus on the Society 5.0 framework. The problem of the research is to address the digital transformation emerging in the context of Society 5.0 in the organizational context and to focus on the changes and transformations experienced in organizations. The aim of this research is to reveal the interaction between digital transformation and organizational culture in businesses, universities and public institutions in Turkey regarding the Society 5.0 structuring. Subsequently, it is to measure the understanding of digital transformation and Society 5.0 of organizations by revealing the connections between the concepts. With the concept of Society 5.0, human-machine interaction will increase to a high level, and every part of society, especially businesses, universities, public institutions, and individuals, will be affected. It is predicted that the cultural structure of organizations will change with the development of technology, and this will lead to important consequences in the context of businesses, universities, and public institutions, which are important triple pillars in the Society 5.0 era. This will fill a research gap in the literature.

Literature Review
Digital Transformation

Rapid technological revolution and transition have swept the entire world. Adapting to this digital transition period has become a key objective for everyone, for instance, individuals, societies, businesses, and government (Agrawal et al., 2019). The process of transitioning from an analog (physically/manually) to a digital state is known as digitalization. Digital Transformation (DT) is a far more comprehensive notion with significant implications for people, businesses, and societies (Vial, 2019). Essentially, DT is the process of implementing digital technology to harmonize organizational objectives, values, and culture with the workforce. It is important to properly comprehend and manage this transition in addition to putting it into practice (Kiron & Spindel, 2019; Schuchmann & Seufert, 2015).

Structure, methods, strategy, and culture all need to be altered fundamentally because of DT (Vial, 2019). In general, the effects of digital transformation have an impact on many fundamental structures of an organization, including employees, management structure, workplace culture, and business processes (Carlsson et al., 2022; Nalbantoğlu, 2021); therefore, a holistic and human-centered perspective is essential (Silva et al., 2020). To create a society where people can pursue various lifestyles and forms of happiness in their own ways using digital technologies and data, DT seeks to usher in a new phase not only in businesses but also in the structure of individuals and society (Keidanren, 2018). Liu et al. (2011) define DT as the integration of digital technologies into business processes and scopes. While digital transformation leads to a new stage not only in businesses but also in the structure of individuals and society, it aims to create a society where people can follow different lifestyles and forms of happiness in their own way and use digital technologies and data (Keidanren, 2018).

The notion of DT is examined within the parameters of the study in terms of two sub-dimensions: Digital Capabilities (DC) and Digital Leadership (DL) (Westerman et al., 2014). DC is a notion that illustrates the digital skills that people or organizations have. In this context, the term "DC" refers to ideas like the fundamental capacities of people or organizations, "digital capacity and investments," "qualified workforce," "ICT usage level," and "new digitalized business processes and models." The capacity of a company to integrate, construct, and reconfigure its internal and external resources and capabilities to meet and shape rapidly changing business environments is described in another definition of DC as high-level competencies (Teece et al., 1997). In conclusion, DC is the technological skills that staff members, clients, and other stakeholders have or need in many fields to support an organization's advancement into the digital age (Morakanyane et al., 2017). A key idea that encourages the digitalization of enterprises is DL. Effective leadership is crucial for a business to successfully switch from a paper-based environment to a digital one. According to Mihardjo and Sasmoko (2019), DL is the confluence of a leader's culture and capability to add value to the organization and use digital technologies. According to De Waal et al. (2016), DL is the accomplishment of an ICT-based goal through the activities of people and their use of technology.

Organizational Culture

As members of an organization interact with their surroundings, a common set of norms, values, and worldviews emerge. This is known as Organizational Culture (OC). OC is defined as a set

of shared values, norms, standards, and assumptions that influence behavior by promoting organizational commitment, providing direction, and generating holistic rewards (Liu et al., 2022). When the environment, resources, values, and goals of the organization are in harmony, the OC fulfills its intended purpose. Thus, OC affects organizational change and transformation by determining the quality of work life and professional performance. Schein (1983) divided OC into three components to demonstrate its benefits in terms of organizational performance. These three components consist of assumptions, artifacts, and values. Assumptions represent the informal yet significant rules within the organization. Artifacts are the visible elements of OC, including work processes, workplace environment, and organizational structures. Values are the beliefs and ways of doing business of organizational members and constitute the invisible part of the organization, the underwater part of the iceberg (Schein, 1983).

According to Schneider et al. (2016), OC is the set of standards that employees perceive as part of their workplace, and it impacts how employees act and change to meet organizational objectives. According to Hofstede (2001), OC is the collective mental programming that sets members of one organization apart from those of another. According to Pettigrew (1979), OC is a system of meanings made up of symbols, language, beliefs, rituals, and myths that encourage members of an organization to share common values, ideals, and beliefs. Innovative organizations may be better prepared for uncertainties coming from the external environment, more adaptable to evolving technologies, and employees in such organizations may have more concerns compared to non-innovative organizations (Guerra et al., 2023; Lau et al., 2002; Wei et al., 2013). The development of a digital OC within a company is a significant result of an innovative OC. A digital OC develops when organizations digitize. A set of relative values, presumptions, beliefs, interaction styles, and work processes is referred to as a digital OC (Pangarso et al., 2022). With a focus on employee well-being, an open and productive organizational culture is developed during the digital transformation process by fostering a flexible and inclusive work culture that actively seeks employee feedback and input (Coldwell, 2019).

In the scope of the research, OC was examined in four dimensions based on the "Organizational Culture Assessment Instrument (OCAI)" framework developed by Cameron and Quinn (2011): Clan Culture (CC), Adhocracy Culture (AC), Market Culture (MC), and Hierarchy Culture (HC). CC focuses on flexibility and internal focus. It is characterized by a workplace where individuals share their personal and professional experiences, creating a sense of intimacy (Prystupa- Rządca, 2017). It is named CC because of its resemblance to a family-like organization where the leader plays a central role (Cameron & Quinn, 2011). According to Cameron et al. (2006), the characteristics of AC include being original, dynamic, agile, flexible, entrepreneurial, innovative, risk-taking, ready for change, and assertive. MC is more interested in the organization's competitors and external environment than its internal environment. To compete and produce is the primary objective of this kind of company. Efficiency, effectiveness, competitiveness, and outcome optimization are the key organizational ideals ingrained in this culture (Felipe et al., 2017). HC is defined by minimizing the degree of uncertainty, certainty, predictability, efficiency, stability, and uniformity. Procedures, stringent standards, and policies are prioritized in this type of culture and strategically predicated on stability and effective business execution (Cameron & Freeman, 1991).

Society 5.0

Certain situations or events have led to social changes and transformations throughout history. With the development of technology, these changes and transformations continue to occur more frequently. One of the concepts that emerged in this context is Society 5.0 (S5.0), which was first discussed at the CeBIT Information Technology Fair. S5.0 is defined as a social understanding that is transformed by the opportunities provided by Industry 4.0 and digitalization, where science and technology are at the forefront (Akın et al., 2021). It has been put forward as the idea that technology is not a threat to societies but rather an aid. With this concept, humanity will adapt to the digital age, and emerging technological opportunities will be distributed equally and fairly among all segments of society (Roblek et al., 2021).

Human societies have gone through many phases, from early man to modern social structures, and have been exposed to a wide range of technological developments. These are the evolutions from Society 1.0 to Society 4.0, respectively. The concept of Society 1.0 (hunter-gatherer society) represents the first stage in the formation of the current social structure and constitutes the initial fundamental stage of human development (Council for Science, Technology and Innovation, 2016). In the concept of Society 2.0 (agricultural society), humanity learned to utilize land, sunlight, and water after the initial societal structure, leading to a new agricultural civilization. The Industrial Revolution gave rise to the idea of Society 3.0 (industrial society). Production expanded because of the advancements in steam power technology, and machinery-based mass production operations were established (Narvaez Rojas et al., 2021). The internalization of information led to the concept of Society 4.0 (the information society). "Knowledge" is the key to this society, according to Harayama (2018). Technology in this era has made it easier to utilize information (Narvaez Rojas et al., 2021). The concept of Society 5.0 (super-smart societal structure) represents the latest social and technological evolution. The Japanese government introduced the concept of "Society 5.0," which encompasses smart communities, smart infrastructure, smart factories, and other digital transformations, as a kind of response to Industry 4.0 (Kiepas, 2021) and as a representation of a smart societal structure (Fukuyama, 2018; Huang et al., 2022). The structuring of Society 5.0 is an outcome or an effect of the profound technological changes brought about by Industry 4.0. Deguchi et al. (2020) defined the concept of S5.0 as an ideal form of our future society, combining the physical realm (the real world) and the cyber realm through extensive information and communication technologies. They described it as a "super smart society" achieved through initiatives that leverage technology to its fullest potential. The concept aims to create cyber-physical spaces that enhance production and technological advancements while prioritizing the well-being of individuals. Deguchi et al. (2020) explain the rationale behind the term Society 5.0 as follows: "Society 5.0 is a call for a new society led by scientific and technological innovations and new transformations after hunter-gatherer society, agricultural society, industrial society, and information society".

Digital transformation processes and organizational cultures and changes in organizational cultures are important in the structuring, implementation, and adoption of the concept of Society 5.0 by businesses/societies. The lack of comprehension of the interrelationship between human and cultural factors in the context of digital transformation is a consequence of the inability of companies to effectively translate the stages of digital transformation into organizational culture. In this regard, the advent of Society 5.0, the latest phase of digital evolution, also serves

as a significant reference point. Therefore, it is essential to examine the interconnections between these three concepts.

To establish the sub-dimensions of Society 5.0, a review of the literature was done within the parameters of the study (Akın et al., 2021; Carayannis & Morawska-Jancelewicz, 2022; Deguchi et al., 2020; Ferreira & Serpa, 2018; Gladden, 2019; Holroyd, 2020; Potočan et al., 2020; Zengin et al., 2021). "*Sustainability, agility, human-centered, innovation, social innovation, productivity, and awareness*" are some of these sub-dimensions. To achieve the new economic and social revolution where discontinuous and disruptive changes are anticipated, according to Keidanren, who first proposed the idea of Society 5.0, there are "five walls (barriers)" that must be overcome. The legal system's limitations, knowledge gaps in the digitalization of problems, a lack of skilled people, socio-political biases, and social resistance are among them (Keidanren, 2018).

Research Model and Hypothesis Development

Depending on the primary goal of the study, a few sub-objectives were developed within the parameters of the research. To accomplish these goals, the relationship between OC and S5.0 as well as the interaction between OC and DT, were qualitatively and quantitatively explored. In this context, the sub-objectives are as follows: 1) Revealing the interaction between DT and OC, 2) Explain how DT relates to structuring S5.0, 3) Identification of the relationship between OC and the structuring of S5.0, 4) Exploring the links between DT, OC, and the structure of S5.0.

Given that the dynamics of the DT process are based on an organization's ability to establish appropriate routines for working digitally, it is strongly related to OC (Martínez-Caro et al., 2020). When creating new systems and putting cutting-edge technologies into use, OC is crucial (Frisk & Bannister, 2017). It would be insufficient to consider DT only as a business model in this situation. For a successful digital transformation, it is imperative to consider OC, structure, work practices, adopted values, and even ethics (Henriette et al., 2016). In other studies, it is stated that digital transformation has positive effects on organizational culture and plays a role in cultural changes in organizations (Barlette & Baillette, 2022; Pfaff et al., 2023). In this context, this study was conducted to reveal what impact digital transformation has on organizational culture. In this context, the first main hypothesis and sub-hypotheses were formulated:

H₁: DT has a significant effect on OC.

$\quad$**H₁ₐ:** DL has a significant effect on clan culture.
$\quad$**H₁b:** DL has a significant effect on adhocracy culture.
$\quad$**H₁c:** DL has a significant effect on market culture.
$\quad$**H₁d:** DL has a significant effect on hierarchy culture.
$\quad$**H₁e:** DC have a significant effect on clan culture.
$\quad$**H₁f:** DC have a significant effect on adhocracy culture.
$\quad$**H₁g:** DC have a significant effect on market culture.
$\quad$**H₁h:** DC have a significant effect on hierarchy culture.

Trenerry et al. (2021) have stated that OC and climate impact DT and its processes. They have found that an innovative and collaborative environment supports digital transformation, while traditional command-and-control structures make it more difficult. In another study, Plekhanov et al. (2022) mentioned that OC can serve as both an accelerator and a barrier to digital transformation. Lastly, Wang et al. (2022) have found that digital OC has an influence on DL and supports businesses in implementing digital transformation. Pfaff et al. (2023) argue that DT processes have significant effects on OC and that DT has transformed the company's OC towards increased collectivism, femininity, tolerance, and long-term orientation and reduces power distance and uncertainty avoidance. Another study found that the more developed the organizational culture and the higher the trust with partner organizations, the more active organizations are in using digital transformation (Kim et al., 2024). In this context, the following second main hypothesis and sub-hypotheses were formulated:

H2: OC has a significant impact on digital transformation.

    H2a: Clan culture has a significant impact on DC.

    H2b: Adhocracy culture has a significant impact on DC.

    H2c: Market culture has a significant effect on DC.

    H2d: Hierarchy culture has a significant effect on DC.

    H2e: Clan culture has a significant effect on DL.

    H2f: Adhocracy culture has a significant effect on DL.

   **H2g**: Market culture has a significant effect on DL.

    H2h: Hierarchy culture has a significant effect on DL.

It is imperative that an organization's digital transformation (DT) encompass not only technological, operational, and structural changes but also modifications to its leadership and cultural norms (Vial, 2019). In this context, digital transformation efforts have the potential to disrupt and redefine organizational culture (Bozkus, 2023). Therefore, both concepts affect each other. OCs, DT processes, and OC changes all play a crucial role in how organizations and societies structure, implement, and absorb the idea of S5.0.

Digital transformation processes and organizational cultures and changes in organizational cultures are important in the structuring, implementation, and adoption of the concept of Society 5.0 by businesses/societies. Because of the literature review, the conceptual model in Figure 1 below was created, which illustrates the link between all three variables in this situation.

Figure 1

Conceptual Model of the Research
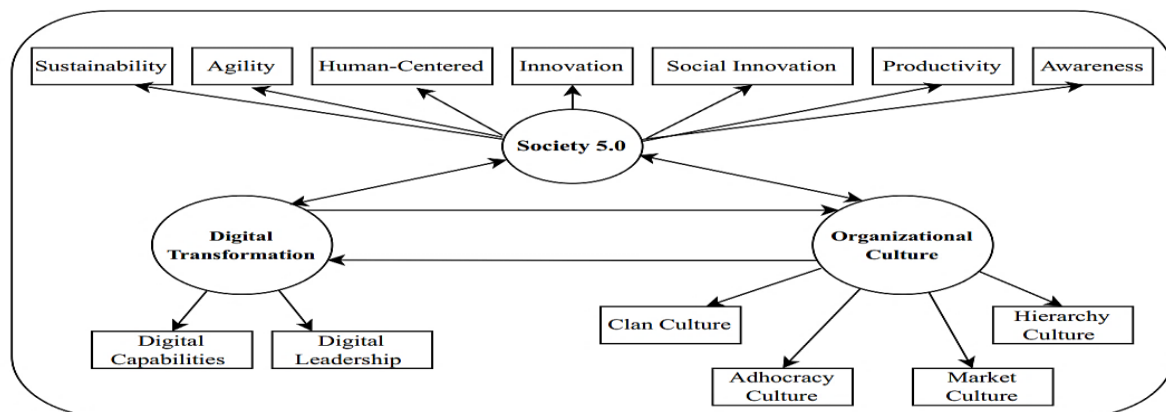
As a result of the literature review, while there are studies between binary variables such as DT and OC, there is no study in which all three variables are together. In this context, the method part of the research was started.

Method

In this research, a mixed methods approach was preferred to conduct in-depth research and to explore different perspectives related to the topic. It is stated that the mixed methods approach serves as a bridge between quantitative and qualitative methods, making it suitable for comprehensive investigations (Onwuegbuzie & Leech, 2004). Within the realm of mixed methods, an explanatory sequential design was employed as the methodology. The selection of the explanatory sequential design in this study is driven by its ability to explore and test unknown or theoretically unconnected variables and dimensions, as well as to generalize qualitative findings from a small sample (Creswell & Plano Clark, 2018; Morse, 1991).

Sample

Purposive sampling was used to gather information from three separate sample groups for the quantitative study to shed light on the relationship between OC and digital transformation. In this situation, 415 individuals took part in the study. The first sample group was chosen from business managers in medium and large firms working in the private sector and registered in the chambers of industry/commerce. The second sample group comprises academicians employed by institutions conducting research on OC, DT, and S5.0. The third sample group consists of public sector employees working in the central units of the Ministries as competent decision-makers in the fields related to the subjects of the research.

The population of the qualitative study consisted of 415 individuals who participated in the survey. A purposive sampling method was used to select the sample from this population. Interviews were conducted with 46 participants (16 business executives, 15 academicians, and 15 public employees) who were knowledgeable about the research topics and capable of conducting in-depth analyses. The participants were classified as PE1 (Participant Business Executive 1), PA1 (Participant Academicians 1), and PP1 (Participant Public Employees 1). The business executive primarily consisted of general managers and top-level executives, academicians mainly included Assistant Professor faculty members and higher-ranking positions, and public employees mostly comprised department heads and higher-ranking officials. Demographic details of the sample groups are given in Table 1.

Table 1

Demographic Findings

Quantitative Sample		Business Executives		Academicians		Public Employees	
		Frequency (N) / (%)					
Gender	Male	113	80.1	82	59.9	84	61.3
	Female	28	19.9	55	40.1	53	38.7
Age	25-32 Years	45	31.9	29	21.2	63	46.0
	33-40 Years	30	21.3	59	43.1	47	34.3
	41-48 Years	37	26.2	34	24.8	15	10.9
	49-56 Years	23	16.3	10	7.3	9	6.6
	57+ Years	6	4.3	5	3.6	3	2.2
Education	Associate	26	18.5	---	---	---	---
	Undergraduate	69	48.9	4	2.9	68	49.7
	Postgraduate	46	32.6	133	97.1	69	50.3
Total Work Experience	1-5 Years	28	19.8	15	10.9	35	25.5
	6-10 Years	20	14.2	23	16.8	43	31.4
	11-15 Years	23	16.3	38	27.7	27	19.7
	16+	70	49.7	61	44.6	32	23.4
Job Titles		Marketing Manager- 2	1.4	Research Assistant/Lecturer- 46	33.6	Head of Department- 12	8.8
		Digital Transformation Executive- 7	5	Assistant Professor- 42	30.7	Officer- 3	2.2
		General Manager- 36	25.5	Associate Professor- 35	25.5	Engineer- 33	24.1
		Assistant General Manager - 3	2.1	Professor Doctor-14	10.2	Chief/Branch Manager- 11	8
		Business Owner/Partner - 24	17			Expert-Inspector-Auditor-60	43.8
		Quality Control Manager- 4	2.8			Lawyer- 5	3.6
		HRM Manager- 44	31.2			Consultant- 3	2.2
		Production Manager- 7	5			Project Manager- 4	2.9
		R&D Manager- 7	5			Board Member- 2	1.5
		Chairman of the Board of Directors- 7	5			Other- 4	2.9
Total		N= 141	%100	N= 137	%100	N= 137	%100
Qualitative Sample							
Business Executives		Male: 11 persons Female: 5 persons	Age: Between 28-59 age Total Work Experience: Between 3-35 years			Total: 16 persons	
Academicians		Male: 8 persons Female: 7 persons	Age: Between 30-67 age Total Work Experience: Between 4-34 years			Total: 15 persons	
Public Employees		Male: 10 persons Female: 5 persons	Age: Between 28-48 age Total Work Experience: Between 5-19 years			Total: 15 persons	

Instruments

The study employed two separate scales. Westerman et al. (2014) study is where the size of DT was derived. The scale has two sub-dimensions, "DL" and "DC," each with ten elements. The "Cameron and Quinn Organizational Culture Scale-Competitive Values Model," developed by Cameron and Quinn (1999) from four dimensions and 24 items and condensed by Yörük Karakılıç (2019) into four dimensions and 16 items, was utilized as the OC scale. These are the sub-dimensions of "clan, adhocracy, market, and hierarchy culture". The 5-point Likert scale was used to create the survey forms. All necessary legal permissions were obtained within the scope of the research.

In the qualitative element of the study, data was collected using a semi-structured interview style that included semi-structured questions (Bryman & Bell, 2011). A series of questions is posed to each participant, who is then afforded the opportunity to respond in an unrestricted and uninhibited manner (Berg & Lune, 2014). Four basic questions were prepared for the semi-structured interview based on the studies on S5.0, DT, and OC. 1- What is DT? What is S5.0, which is assumed to be the next stage of I4.0? What are the sub-dimensions/elements of the concept of S5.0? What does the concept of S5.0 mean to you? 2- Do you think there is a relationship between Society 5.0 and OC? 3- Do you think there is a link between DT and S5.0? 4- What is the relationship between DT and OC?

Analysis

The quantitative analysis of the survey data obtained for the research was conducted using the SPSS 25 and AMOS 24 package programs. In this context, the following analyzes were conducted: Cronbach's alpha value, Explanatory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), Structural Equation Modeling (SEM). On the other hand, within the scope of the qualitative method of the research, the following qualitative method analyses were conducted separately for each sample group, and these analyses are as follows: The Code Relations Matrix and the Code Co-occurrence Model (Overlapping Codes) are the two analytical tools used in this study.

The Cronbach's alpha of the scales under the study's purview was .94 for DT and .92 for OC. The sub-dimension Cronbach's alpha was also quite high. To validate the scales' validity and dimension them in the pertinent elements, EFA was done within the study's parameters (Watkins, 2018). Generally, in EFA, it is desired that the Kaiser-Meyer-Olkin (KMO) values are ≥ .70 (Hair et al., 2010). Furthermore, the factor loadings of the identified items are expected to be above .40 (Tabachnick & Fidell, 2013). The KMO of DT and the KMO of OC in the analyses carried out as part of this study were both .92 and .93, respectively, and all values were at the desired level. CFA was started after this stage. Following an EFA, a CFA is conducted to determine whether and to what extent a previously utilized scale is acceptable for the original scale (Brown, 2015). The internal consistency of the scales was evaluated using the Average Variance Explained (AVE) and Composite Reliability (CR) values (Bagozzi & Yi, 1988). The results are higher above the threshold of .70, ranging from .81 to .94. This demonstrates the scales' high dependability. According to Fornell and Larcker (1981), for the validity of the structure, the standardized factor loading of individual factors should be greater than .50, the CR value should be greater than .70, and the AVE value should be greater than .50 (Rejikumar et al., 2019). All the obtained values met the desired levels. Finally, the results of the analysis

of variance between variables yielded excellent fit indices and acceptable fit, resulting in a significant outcome. All the obtained results are presented in Table 2.

Table 2

Results of the Analysis and Findings of the Study

Factors	Loading		Cronbach's Alpha/AVE/CR	Skewness/Kurtosis/KMO
Digital Transformation	EFA	CFA	.94	
Digital Capabilities (DC)				
DC1	.71	.65		
DC2	.79	.75		
DC3	.84	.79	.90 / .62 / .89	
DC4	.83	.85		
DC5	.77	.75		Skewness= -.31
Digital Leadership (DL)				Kurtosis= -.39
DL1	.80	.77		KMO: .92
DL2	.82	.78		Bartlett's Test: 4950.93
DL3	.79	.78		df: 105
DL4	.83	.85		p: .000
DL5	.81	.82	.95 / .64 / .94	Total Variance Explained: %69.202
DL6	.83	.87		
DL7	.84	.88		
DL8	.78	.80		
DL9	.79	.78		
DL10	.73	.69		
Organizational Culture			.92	
Clan Culture (CC)				
CC1	.81	.78		
CC2	.75	.85	.86 / .55 / .83	
CC3	.72	.73		
CC4	.67	.77		
Adhocracy Culture (AC)				
AC1	.78	.83		Skewness= -.41
AC2	.81	.86	.91 / .58 / .84	Kurtosis= -.45
AC3	.78	.90		KMO: .93
AC4	.65	.81		Bartlett's Test: 4409.56
Market Culture (MC)				df: 120
MC1	.68	.83		p: .000
MC2	.74	.79	.86 / .51 / .81	Total Variance Explained: %74.218
MC3	.61	.83		
MC4	.81	.66		
Hierarchy Culture (HC)				
HC1	.76	.61		
HC2	.79	.92	.84 / .65 / .88	
HC3	.83	.52		
HC4	.83	.79		
Note.	All Confirmatory Factor Analysis (CFA) results are statistically significant $p < .001$			
Path analysis on the impact of DT on OC	$\chi2/df$=2.48, GFI=.85, CFI=.93, NFI=.89, TLI=.92, SRMR=.07, AGFI=.83, RMSEA=.06			
Path analysis on the impact of OC on DT	$\chi2/df$=3.28, GFI=.81, CFI=.90, NFI=.86, TLI=.89, SRMR=.07, AGFI=.78, RMSEA=.07			

Results

The social sciences frequently employ the highly generic statistical modeling method, structural equation modeling (Hox & Bechger, 1998). The outcomes of the route analyses between the primary and secondary dimensions of DT and OC are displayed in Table 3.

H$_1$ hypothesis from the main hypotheses: The effect of DT on OC is (β = .74, $p < .001$) and H$_2$: The effect of OC on DT is (β = .74, $p < .001$). The CFA value loadings of both the DT scale and the OC scale were above .50 and it was determined that all correlation relationships formed a meaningful integrity. In addition, it is seen that the model is significant, and the t-values calculated for the factor loadings of each observed variable belonging to the model are all above

1.96. All factor effects and hypotheses were positive at $p < .001$ significance level, and all of them were accepted.

Table 3

Structural Equation Modeling Analysis Results of the Model Between DT and OC

|	Effect	Direction	β	Std. Error	t	p	Results
H_1	DT→OC		.746	.099	10,269		
H_{1a}	DL →CC		.651	.062	10,738		
H_{1b}	DL →AC		.616	.067	10,694		
H_{1c}	DL → MC		.541	.062	8,674		
H_{1d}	DL → HC		.432	.064	7,728		
H_{1e}	DC → CC		.400	.076	6,695		
H_{1f}	DC → AC		.324	.084	5,732		
H_{1g}	DC → MC		.300	.077	5,067		
H_{1h}	DC → HC	All directions were	.283	.085	4,942	All values were ***	All hypotheses were accepted
H_2	OC → DT	+	.746	.050	10,922		
H_{2a}	CC → DC		.348	.048	6,089		
H_{2b}	AC → DC		.277	.040	5,064		
H_{2c}	MC → DC		.239	.047	4,198		
H_{2d}	HC → DC		.262	.041	4,674		
H_{2e}	CC → DL		.646	.059	10,592		
H_{2f}	AC → DL		.614	.049	10,620		
H_{2g}	MC → DL		.542	.061	8,526		
H_{2h}	HC → DL		.416	.049	7,422		

***p < .001.

Krippendorff (1980) listed three distinct levels of dependability for qualitative methods: stability, repeatability, and accuracy. It is crucial to do these three steps one at a time (Çini, 2022; Çini et al., 2023). First, after coding was completed using the MAXQDA 20 software, a period was allowed to pass, and then comparable findings were achieved when coding was completed again. In this direction, the stability phase of the research was ensured. Then, two different experts, independently of each other, redid the coding in the analysis process. The similarity rate in both codings was calculated as 89%, and thus, the reproducibility stage was achieved. Finally, the accuracy stage, which Krippendorff calls the non-obligatory stage, is similar to previous studies in the literature. Due to the nature of qualitative research, this stage could not be achieved since each participant gave subjective answers. Since three different sample groups were examined, the analysis code relationship matrices and visual representations of each sample group's analysis results are provided separately. Line width was employed to better see the links between the sub-dimensions and to reveal distinct scenarios in the representation of the models for each of the three sample groups. The frequency of the relationship between two dimensions or subdimensions affects the line width. The relationship was more intense in the models where the relationship lines were thicker (Çini, 2022). The numbers next to the codes in the models show how many times that statement was coded by the participants.

Sample of Business Executives

Figure 2 shows the Code Co-occurrence Model (Overlapping Codes) of business executives. According to this, external focus, differentiation, flexibility, and discretion are more prominent for business executives. In general, S5.0 and DT sub-dimensions are centered around AC and MC. At this point, it is seen that business executives attach more importance to flexibility, market and adhocracy culture, DC, and human centered.

Figure 2

Code Co-occurrence Model (Overlapping Codes) in Business Executives
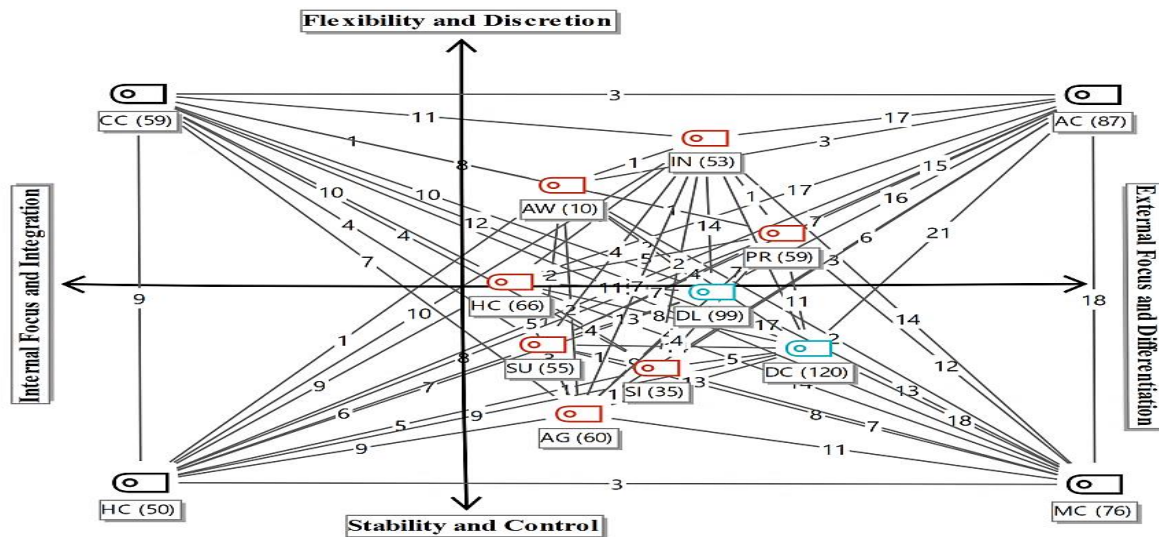
Note. AW: Awareness, SI: Social Innovation, PR: Productivity, IN: Innovation, AG: Agility, SU: Sustainability, HC: Human Centered.

Sample of Academicians

Figure 3 shows the Code Co-occurrence Model (Overlapping Codes) of academicians. According to this, external focus, differentiation, stability, and control are more prominent for academicians. In general, Society 5.0 and DT sub-dimensions are centered around market culture, adhocracy culture and others culture. At this point, it is seen that academicians attach more importance to stability, control, DC, human-centered, agility, and sustainability.

Figure 3

*Code Co-occurrence Model (Overlapping Codes) in Academicians*
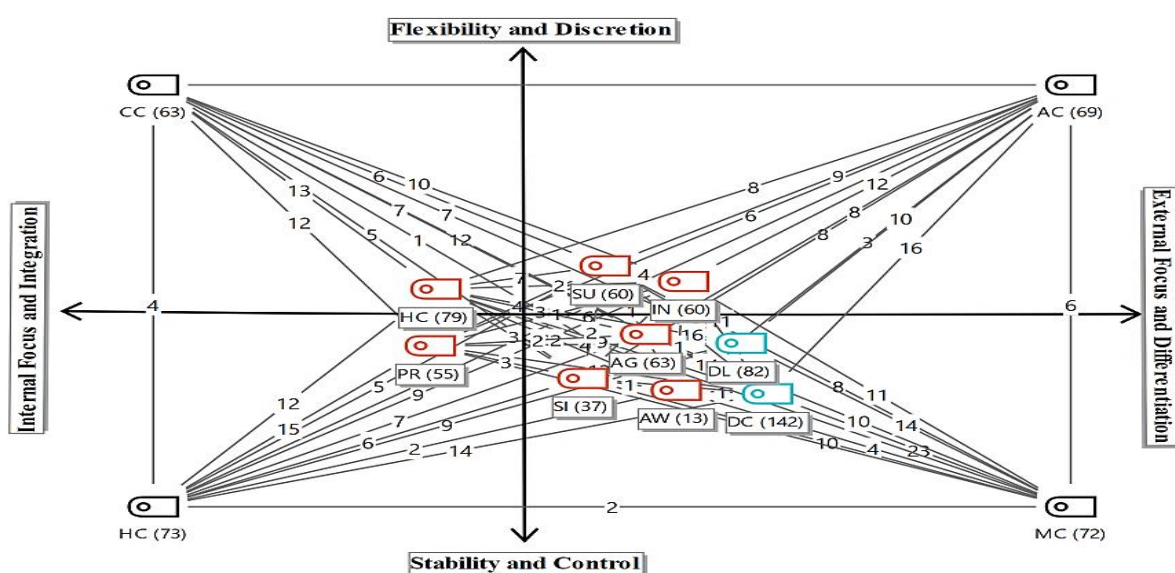
Sample of Public Employees

Figure 4 shows the Code Co-occurrence Model (Overlapping Codes) of public employees. According to this, external focus, differentiation, stability, and control are more prominent for public employees. In general, S5.0 and DT sub-dimensions are centered around market culture, adhocracy culture, and other cultures. At this point, it is seen that public employees attach more importance to stability, control, DC, and DL, human centered, productivity, innovation.

Figure 4

Code Co-occurrence Model (Overlapping Codes) in Public Employees
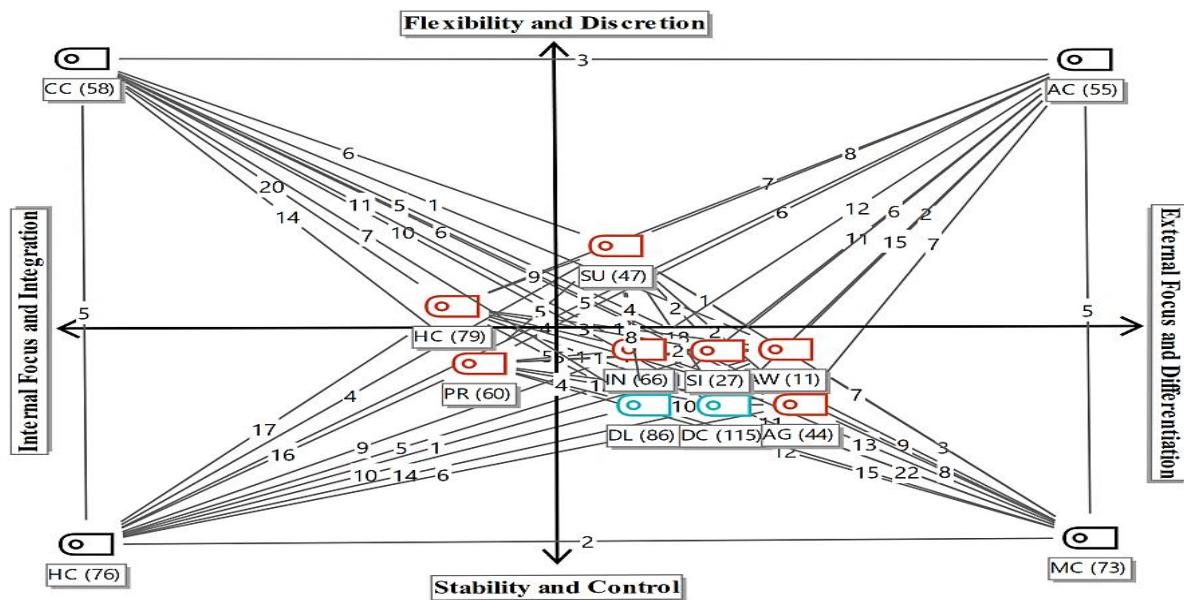
The code relationship matrix for each category is displayed in Table 4. There were 6407 codes disclosed in total. There were 367 links between DT and S5.0, 517 relationships between DT and OC, and 319 relationships between these two variables. The most prominent relationship has emerged between S5.0 and OC. In S5.0, the most frequently mentioned sub-dimension is innovation (395), while in DT, the most frequently mentioned sub-dimension is DC (786). In OC, the most frequently mentioned sub-dimension is market culture (531). As a result, among the significant findings of this research, it is evident that the participants attach greater importance to innovation, DC, and market culture (a competitive environment).

Table 4

Code Relations Matrix for All Groups

Code System	DT	DL	DC	S5.0	AW	SI	PR	IN	AG	SU	HC	TOTAL
DT	0	264	376	367	19	27	56	73	63	73	64	1382
DL	264	0	44	130	9	10	15	36	19	30	22	579
DC	376	44	0	178	10	19	35	30	44	48	28	812
OC	319	118	180	517	24	70	118	117	97	72	126	1758
HC	70	26	37	146	4	16	39	28	22	15	38	441
MC	100	42	63	136	9	26	33	38	29	23	31	531
AC	91	37	52	133	8	20	27	41	28	24	32	494
CC	58	24	34	132	3	14	34	32	20	16	43	410
TOTAL	1278	555	786	1741	86	202	357	395	322	301	384	6407

Note: AW: Awareness, SI: Social Innovation, PR: Productivity, IN: Innovation, AG: Agility, SU: Sustainability, HC: Human Centered.

Discussion

Businesses and society at large are currently facing a DT process that affects commercial activities and all kinds of operations (Chew et al., 2013; Morakanyane et al., 2017). DT goes

beyond digitization alone and involves reorganizing processes, business models, and organizational structures. It is a concept that impacts all employees and companies, aiming to move from analog to digital rather than just converting tasks from analog to digital (Verhoef et al., 2021). It is an incomplete perspective for DT to focus only on technological development and ignore people, organizations, and other developments (Vukšić et al., 2018). Digital transformation, the extensive use of technology to reshape businesses, has brought forth a plethora of new technical solutions. These innovations have the power to not only remodel the behaviors and decision-making processes of both providers and consumers but also to redefine the service experience across the entire consumer journey (Troisi et al., 2023). The proliferation of the internet, information, and technology applications forces organizations to digitize their processes and offer innovative products, services, and business models (Rodríguez-Abitia & Bribiesca-Correa, 2021). Japan is always working to develop a "super-smart society" where new knowledge and values are created to take the transformation beyond industry and help promote economic growth and social welfare. Japan has an advanced economic level and cutting-edge technology. The super-smart society, or Society 5.0, seeks to do more than only revolutionize society with advanced ICT, AI, and robots. It also seeks to address numerous economic and social concerns (Fukuda, 2020).

Within the framework of the conducted analyses, H_1 was analyzed, and it was found that DT has a significant and positive effect on OC ($\beta = .75$, $p = .001$). This result is supported by some studies in the literature (Guerra et al., 2023; Kiron & Spindel, 2019; Nalbantoğlu, 2021; Vial, 2019). The other main hypothesis of the study H_2, was analyzed and it was found that OC has a significant and positive effect on DT ($\beta = .75$, $p = .001$). This result is supported by some studies in the literature (Plekhanov et al., 2022; Trenerry et al., 2021; Wang et al., 2022).

The research's qualitative methodology came to the following conclusions. Regarding the sample group of business managers, they claimed that they are attempting to experience DT because of the interviews, that they are attempting to acquire new digital skills rather than laying off employees as they move towards digitalization and automation in business processes, and that they are attempting to adapt to DT professionally. The enterprises are the actual workshops on business processes and digital transformation. Very few of them claimed that the digital transition had led to layoffs. Business owners and top management often have positive opinions on DT and S5.0 and see these two ideas as processes that must be undergone. In this sample group, the ideas of human orientation, agility, and efficiency show out. Universities and the academics working in them serve as places where the concepts of DT and S5.0 exhibit conceptual action in terms of the sample group. The work carried out by academics on these concepts holds a significant position, particularly as a guiding resource for businesses and the public sector. Among academics, the sub-dimension of human-centricity takes precedence, followed by agility and innovation as prominent dimensions. Public personnel are significant players in the sample group who could foster collaboration between corporations and universities. The public sector needs to commit to some axioms to build and implement the principles of DT and S5.0 in this setting, particularly the legal laws it will adopt. The ideas of human orientation, innovation, and efficiency are the dimensions that are most frequently attained. In general, for businesses to adapt to the rapidly evolving digital technology breakthroughs and for their cultures to recognize this transition, the public conducts studies, develops new regulations and laws, and provides training.

In today's era of digitalization, the transformation of some basic concepts, including organizational structure, processes, strategy, and culture, has an impact on the development of an organization (Tuukkanen et al., 2022). In this context, increasing and directing DC with good DL is important for businesses to adapt to DT processes. Lin and Xie (2023) stated that energy companies in the public sector have embraced DT more extensively compared to other companies. Another study by Naranjo-Valencia et al. (2016) investigated the link between innovation and clan, adhocracy, market, and hierarchy cultures in Spanish organizations. They concluded that adhocracy culture, the most prominent culture that supports organizational innovation, is external, adaptable, and variable. Clan and market cultures have no impact on organizational innovation. In a study by Cherian et al. (2021), 69% of employees stated that OC is highly important for work productivity. In their study investigating the impact of OC on agility, Felipe et al. (2017) found that clan culture, adhocracy culture, and hierarchy culture positively influence agility, whereas market culture has no effect on agility. Grayson et al. (2018) found that businesses with high levels of sustainability demonstrate a specific and distinctive OC. Rodríguez-Abitia and Bribiesca-Correa (2021) proposed applying an integrated DT model to measure the sophistication of educational institutions in DT processes and compare them with other sectors.

Conclusion

One of the recently researched topics is the concept of S5.0. This study looks at the connection between this idea, digital change, and OC. The development of a digital OC is thought to indicate an organization's preparedness to begin developing its digital strategy execution plan. Therefore, a specific digital OC is required to successfully implement DT and achieve success (Hadi & Baskaran, 2021). In this context, OC and DT are intimately intertwined, and the adoption of DT depends on the presence of an innovative OC. For DT to occur in this setting, the organizational structure must be altered, and it is presumed that this has an impact on OC (Nalbantoğlu, 2021). According to past studies, the relationship between OC and DT has grown in importance (Cruz-Cárdenas et al., 2022).

The results of the study indicated a significant and positive interaction between DT and OC. This effect is similarly observed within the sub-dimensions of these variables. The sub-dimensions mutually benefit one another in a meaningful and positive manner. In this context, DT and OC within the organization are two important concepts that influence and change each other. If a DT is to take place in an organization, it cannot be separated from the OC. Again, DT cannot be regarded in isolation when considering the digitalization of OC within a company. Again, it is important to understand the relationship between DT and OC to make sense of the idea of S5.0. S5.0 must be recognized as a notion that cannot be disregarded in the business world, one that organizations understand and accept. This is crucial for the study's goals. Conversely, from an implementation perspective, S5.0 introduces novel technologies, thereby creating new value in a range of domains, including automated driving systems, healthcare, commercial transactions, transportation, agriculture, forestry, and tourism, among others. This situation compels organizations to adapt to digital OC in the context of DT and to be at the vanguard, especially in terms of competition, velocity, and agility.

The limitations of this study include the difficulty in reaching the sample, as purposive sampling was employed in the study. Additionally, difficulties were encountered in

understanding and responding to the subject, as well as in working with three different sample groups. Of note is the very new concept of S5.0. Another limitation of this study is that the data were collected during a period when the impact of the Covid-19 pandemic continued to be felt.

Declarations

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