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-RESEARCH ARTICLE-

# THE MEDIATING ROLE OF DIGITAL ORGANIZATIONAL CULTURE IN THE IMPACT OF DIGITAL LEADERSHIP ON EXPLORATORY INNOVATION

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***Abstract***

*In order to meet customer and market demands, exploratory innovation necessitates innovative designs and creative approaches. The goal of this research is to ascertain the mediating effect of digital organisational culture on the impact of digital leadership, which embodies the desire to proactively use technology to add value to an organisation. The 7.023 personnel that are registered in the computer engineers' room make up the study's population. Of the people who are employed, 414 computer engineers have been chosen as the study's sample. Frequency analysis, exploratory factor analysis, reliability analysis, correlation analysis, normality analysis, and hierarchical regression analysis were all used to analyse the data. According to the findings of the correlation analysis carried out as part of the study, there is a positive and significant relationship between digital leadership and exploratory innovation, a positive and significant relationship between digital organisational culture and digital leadership, and a positive and significant relationship between digital leadership and digital leadership. The initial stage of the hierarchical regression analysis process revealed that exploratory innovation is significantly impacted by digital leadership. It was discovered in the second phase that digital organisational culture is significantly impacted by digital leadership. Exploratory innovation is significantly impacted by digital organisational culture, according to the results of the third level of hierarchical regression analysis. The impact of digital leadership on exploratory innovation is somewhat mediated by digital organisational culture, it was found in the fourth and final step. Digital organisational culture was found to have a negative impact on exploratory innovation when it was included in the hierarchical regression analysis. Consequently, steps that should be taken to guarantee that digital organisational culture predominates in the companies where the people in the sample work have been recommended. There aren't many research examples in the literature that show how digital organisational culture mediates the effect of digital leadership on exploratory innovation.*

**Keywords:** *Digital Leadership, Exploratory Innovation, Digital Organizational Culture, Computer Engineer.*

**JEL Codes:** *M1, M13.*
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# DİJİTAL LİDERLİĞİN KEŞFEDİCİ İNOVASYON ÜZERİNDEKİ ETKİSİNDE DİJİTAL ÖRGÜT KÜLTÜRÜNÜN ARACILIK ROLÜ[6]


## *Öz*

*Bu araştırmanın amacı, bir örgüte değer katmak için teknolojiyi proaktif olarak kullanma arzusunu taşıyan dijital liderliğin, müşteri ve pazar ihtiyaçlarını karşılamak için yenilikçi tasarımlar ve yaratıcı yollara ihtiyaç duyulduğunu belirten keşfedici inovasyon üzerindeki etkisinde dijital örgüt kültürünün aracılık etkisini belirlemektir. Araştırmanın evrenini bilgisayar mühendisleri odasına kayıtlı olan 7.023 çalışan oluşturmaktadır. Araştırmanın örneklemini bu kişilerden seçilen ve çalışmakta olan 414 bilgisayar mühendisi oluşturmaktadır. Toplanan verilerle frekans analizi, keşfedici faktör analizi, güvenilirlik analizi, normallik analizi, korelasyon analizi ve hiyerarşik regresyon analizi yapılmıştır. Araştırma kapsamında yapılan korelasyon analizinin neticesinde dijital liderlik ile dijital örgüt kültürü arasında pozitif yönlü ve anlamlı bir ilişki, dijital liderlik ile keşfedici inovasyon arasında pozitif yönlü ve anlamlı bir ilişki, dijital örgüt kültürü ile keşfedici inovasyon arasında pozitif yönlü ve anlamlı bir ilişki olduğu belirlenmiştir. Hiyerarşik regresyon analizinin birinci adımında dijital liderliğin keşfedici inovasyon üzerinde anlamlı etkisinin olduğu belirlenmiştir. İkinci adımında dijital liderliğin dijital örgüt kültürü üzerinde anlamlı etkisinin olduğu tespit edilmiştir. Hiyerarşik regresyon analizinin üçüncü adımında dijital örgüt kültürünün keşfedici inovasyon üzerinde anlamlı etkisinin olduğu bulunmuştur. Dördüncü ve son adımında dijital liderliğin keşfedici inovasyon üzerindeki etkisinde dijital örgüt kültürünün kısmi aracılık etkisinin olduğu belirlenmiştir. Dijital örgüt kültürü hiyerarşik regresyon analizinin dördüncü adımında analize dahil edildiğinde dijital liderliğin keşfedici inovasyon üzerindeki etkisinin azaldığı görülmüştür. Dolayısıyla örneklem dahilindeki çalışanların görev yaptıkları örgütte dijital örgüt kültürünün hâkim olduğu ve n planda tutulması içi yapılacaklar adına tavsiyeler sunulmuştur. Literatürde dijital liderliğin keşfedici inovasyon üzerindeki etkisinde dijital örgüt kültürünün aracılık rolünü belirleyen araştırma örneği sayısı oldukça kısıtlıdır.*



**Anahtar Kelimeler:** *Dijital Liderlik, Keşfedici İnovasyon, Dijital Örgüt Kültürü, Bilgisayar Mühendisi.*

**JEL Kodları:** *M1, M13.*

"Bu çalışma Araştırma ve Yayın Etiğine uygun olarak hazırlanmıştır."


[6] Genişletilmiş Türkçe Özet, makalenin sonunda yer almaktadır.

## 1. INTRODUCTION

Industry 4.0, which is centered on the digitalization of human intelligence, is the current iteration of the industrial revolution (Keskin, 2020). This development entails the digitization of labor and human intelligence, leading to the development of artificial intelligence systems. A new business lifecycle is emerging in the shape of digitally integrated value systems connected by information and communication technologies (ICT). Today's organizations can engage with customers on multiple levels and create customer profiles thanks to digital technologies like IoT platforms, location-based technologies, sophisticated human-machine interfaces, smart sensors, big data analytics, and advanced algorithms (Martínez-Caro et al., 2020). Furthermore, a major shift in the structure of current organizations has resulted from the acceleration of digital transformation and the reorganization of workflows in accordance with new digital organizational forms. In comparison to digital leaders in the future, organizations that miss the digitization trend are believed to be slower, less adaptable, and less competitive (Westerman et al., 2014). Within this framework, digitization has the potential to alter the character, requirements, and means of labor (Larjovuori et al., 2016). Strong leadership abilities must be developed in order to foresee and direct the transformation of digitally successful organizations, even though digital transformation processes are seen as a major challenge for the top management and leadership of transforming organizations (Kakabadse et al., 2011; Westerman et al., 2014). In this situation, managers can steer change by using their leadership abilities. "The ability of leaders to create a clear and meaningful vision for the digitalization process and to implement strategies to achieve it" is how Larjovuori and colleagues (2016) described digital leadership (Larjovuori et al., 2016). A competency model created specifically for digital leaders states that a competent digital leader consists of two components. According to Westerman et al. (2012), these are the attitudes, abilities, and behaviors that managers require in the digital age such as digital literacy and competence as well as the competencies that help to promote digital transformation.

The idea of organisational culture has drawn a lot of attention from management scholars and practitioners since Deal and Kennedy (1982), Peters and Waterman (1982) popularised it in the 1980s. "A complex set of values, beliefs, assumptions, and symbols that define how an organisation conducts its business" is the definition of organisational culture (Barney, 1986). Organisational culture is similarly defined by Deshpande and Webster (1989) as "a set of common assumptions and understandings about how the organisation operates." According to Duerr et al. (2018), organisational cultures must change to fit the digital age. In this regard, they propose that digitally transformed organisations will exhibit their work in their evolving organisational structures through novel forms of internal and external collaboration, highlighting the critical role that digital goals and norms play in the development of the new organisational culture, the necessity of incorporating information technologies into innovation, and the necessity of empowering staff members by incorporating their ideas into the digital strategy, thereby establishing an equitable distribution of power.

Exploratory innovation is the dynamic capacity to generate new information, new goods and/or services, and novel combinations of knowledge elements. This innovation represents the entire performance of organisations in terms of innovation (Phelps, 2010). By searching, discovering, experimenting, and taking risks, these innovations enable organisations to question established methods (Katila and Ahuja, 2002). However, the effects of globalisation and the constraints associated with integrating internationally distributed knowledge may provide obstacles for enterprises seeking exploratory innovation. To put it another way, cultural differences, geographic dispersion, and the difficulties in integrating globally distributed knowledge can all make it more difficult for a company to identify, absorb, and create new knowledge as a result of globalisation (Verbeke and Asmussen, 2016; Hong and Pavlou, 2017). For example, Nokia Corporation found it difficult to create new goods despite its widespread presence and diverse cultural background. In order to deal with the growing competition in the smartphone market, Nokia was therefore expected to extend its global perspective and adhere to changing innovations (Johnson, 2011). Within this framework, the study attempts to ascertain the mediating function of digital organisational culture in relation to the influence of employees registered in the computer engineers' room's impression of digital leadership on exploratory innovation behaviour. The research was motivated by the dearth of studies in the literature that discuss how digital organisational culture mediates the relationship between the perception of digital leadership and exploratory innovation behaviour. The following parts provide an explanation of the research's conceptual framework, a summary of earlier investigations, and an expression of the methodology and conclusions.

### 1.1. Digital Leadership

Among the terms we hear most often in the twenty-first century are digitalization, transformation, disruptive technology, and competitive advantage. Artificial intelligence applications, smartphones, virtual reality apps, quick development, the ubiquitous internet, and new wearable technology are examples of how technology is changing quickly (Öz, 2020: 52). Research on leadership has demonstrated that historical processes are evolving more and more. Given that we are in a new period this century, this topic is even more crucial (Dinh et al., 2014). Within this framework, the swift evolution of leadership studies mirrors shifting global norms and technological advancements (Kremer, 1993). Fiedler (1981) described leadership theory historically as the process of managing an individual within a team and organising teamwork, whereas Stogdill (1948: 64) concentrated on the roles, accomplishments, acknowledgment, and involvement of leaders. Following suit, leaders' behaviours on several dimensions have been characterised as leadership by Blake and Mouton (1964), Hersey and Blanchard (1969), House and Mitchell (1975), and Hesse (2018) (Öz, 2020: 47). Therefore, in order to satisfy the demands of the modern day, alternative methods of authority and leadership have been required. The contemporary era's quick shift from the conventional agricultural society structure to the industrial society structure has resulted in a fast-paced process of development and

transformation that has produced the phase of transition to the modern digital society structure. Consequently, leadership models have also been given a new perspective as a result of this process of change and transformation (Asiltürk, 2020). Given the prevalence of technology in this setting, the idea of "digital leadership" has come into its own.

With the advent of the internet, digital leadership refers to the leader's use of technology, customised mobile devices, and digital tools to accomplish their own objectives (Scheninger, 2014). An alternative interpretation defines it as the accomplishment of objectives through the application of information and communication technologies, with the assistance of staff members (Uçar and Tutgaç, 2022: 11). According to Toduk and Gande (2016), profound knowledge, teamwork, innovation, having a solid network structure, and vision are traits of digital leaders. In contrast, Petry (2018) proposed that digital leadership is determined by assessing digital leaders based on their engagement, transparency, digital connectedness, and adaptability in relation to the trust dimension. The focus of this new leadership paradigm, known as "digital leadership," is on developing a framework that will enable reasoning, self-control, and problem-solving in the digital world of research, communication, and cognition (Mack, 2015: 15-16). In this situation, a digital leader is able to integrate social factors into business models and forecast technical conditions with a relevant vision that centres on future technological advancements (Bach and Sulikova, 2021: 216).

The digital leader, also known as the leader of the digital age, ought to inspire others around them, exhibit innovation, focus on the future, shatter stereotypes, behave differently, develop empathy, and be able to assess circumstances from several angles (Prentice, 2013: 179-185). Leaders in this time of transition must be able to oversee the digital transformation process and the ensuing digital organisation (Klein, 2020: 899).

It is crucial that those who are labelled as digital leaders demonstrate the behaviours associated with that style. It is anticipated that the employee's impression of digital leadership will be greatly influenced and guided by the digital leader, who will successfully use information technologies in many areas to convey this position to his or her staff (Abbasov and Tolay, 2021: 71).

### 1.2. Digital Organizational Culture

Innovation, strategy, market share, and technology are important variables for businesses, but a unique organizational culture also ensures that businesses stand out among their competitors. Establishing a system through organizational culture benefits employees in evaluating events, creating a system for evaluation, and ensuring continuity (Cameron and Quinn, 2006). Having a strong organizational culture requires working with people who will adapt to the culture. Culture is a social order not explicitly stated in an organization and broadly guides behaviors (Groysberg et al., 2018). In short, organizational culture is a set of assumptions, values, symbols,

and beliefs that define how an organization does its work (Büschgens, Bauschand and Balkin, 2013: 766).

With the development and continuous change of technology, organizations' cultures are being organized as digital workplaces due to online business activities conducted at the global level (Duer et al., 2018). In this context, the concept of digital organizational culture is expressed as a series of shared values, beliefs, and understandings in the context of digitally organizing activities in the workplace (Ludolf et al., 2017). In this regard, in the process of adapting to digitalization, it is necessary to organize the organizational culture with a digital understanding. Because to integrate advanced technological situations into the organization in response to evolving technology, organizations must elevate their workplace cultures to an advanced level (Zhen et al., 2021; Tilson et al., 2010). Most companies are aware that achieving their digital goals depends on transforming their cultures (Haffke et al., 2017). The dominant presence of network-based technologies in the socio-economic structure of society has led to a change in the structure of society. While individuals previously provided their statuses with the identities offered to them, with the use of network-based technologies, individuals can have multiple statuses and identities (Güzel, 2016: 83). Thus, in environments where network-based technologies are in interaction, it is thought that there is a new culture called digital culture, which has unique norms and values.

Organizations foresee the successful formation of organizational culture in the digital transformation within the principles listed below (Trushkina et al., 2020):

- The corporate environment (vision and values, personnel development methods, tools and resources, leadership, informal communication, organizational design, personnel development, performance management) should be established to implement corporate development strategies and encourage behaviors.
- Teams and employees work result-oriented. They are committed to the organization's goals, objectives and work and are ready to do whatever it takes in this direction.
- Teams and employees work to develop the corporate strategy.

One of the prominent points in the formation of digital culture is the necessity for employees in the organization to participate in digital efficiency training. In this regard, managers or leaders have an important role in supporting digital initiatives and motivating employees. The creation of a digital culture environment passes through a research environment where employees are encouraged to use digital tools outside of working hours (Jantti and Hyvarinen, 2018).

### 1.3. Exploratory Innovation

The promotion of entrepreneurship in developing nations is attributed to causes such as establishing differentiation and contributing value to the economy. Businesses are therefore expected to develop strategies where they can use their entrepreneurial abilities when planning their marketing efforts (Bachmann et al., 2021). In this

context, businesses are obliged to consider the dynamic nature of the competitive landscape as well as their limited resources when formulating their strategies (Mom et al., 2007: 911-912). Accordingly, the study's discussion of exploratory innovation in this context entails learning and using new information to create entirely original services, goods, models, and procedures for expanding markets or attracting new clients (Sheng and Chien, 2016; Wasono and Furinto, 2018). In addition, it is regarded as a talent that upends the status quo and fosters a high degree of creativity that gives it an advantage over competitors (Sheng and Chien, 2016). Exploratory innovation carries a significant degree of risk and expense and is fundamentally complicated. However, in the digital age, it is quite helpful for grabbing hold of advantages and discovering new prospects. Accordingly, exploratory innovation is essential to the growth and sustainability of firms (Lumpkin and Dess, 2001).

Different stages of business use exploratory innovation tactics. When the first stage's plan is effective, an accomplishment is the consequence (Reinders, Frambach and Schoormans, 2010). Market leadership is the inevitable outcome of successful execution in the second stage. This is a result of the product's initial release onto the market. The achievement of market leadership results in heightened rivalry within the sector and the acquisition of several benefits, including cost savings, design, gain ratio, and discounts associated with the company's product or service (Matheus, 2009). Therefore, the primary objectives of these customer-centric firms are to create new services or goods, new markets, and new distribution channels (Sariol and Abebe, 2017: 40). Companies in a position of leadership make the most of their advantageous circumstances. But when new competitors enter the market and they begin to lose their dominant position, they can continue to hold their beneficial position. This is as a result of being the industry leader and leading company (Reid and De Brentani, 2004).

Businesses must obtain new information through exploratory innovation, apart from their current knowledge frameworks. This usually happens as a result of R&D operations, as well as the creation of services or goods and long-term competitive advantages. According to He and Wong (2004), the goal of such innovation is to generate new products and markets, even when it entails extreme and drastic changes. Businesses relying too much on conventional approaches run the risk of failing at exploratory innovation, in addition to the intricacy and technological challenges at their heart. Businesses must concentrate on resources and business concepts in order to succeed with exploratory innovation (Vial, 2021).

## 2. METHODOLOGY

The goal of the study is to identify how digital organisational culture influences personnel registered with the Computer Engineers Chamber's perspective of digital leadership and how that perception affects their exploratory innovation behaviour. 4,14 individuals were chosen at random for the survey out of the 7,023 employees who are enrolled with the Computer Engineers Chamber, which makes up the study population.

The study employed a digital leadership scale with five dimensions: innovation, deep knowledge, curiosity, critical thinking and questioning, and global vision and collaboration. Zhu (2015) invented it, and various empirical studies have made use of it. Four questions make up the scale for measuring digital organisational culture, which was modified from a study by Martínez-Caro et al. (2020). The exploratory innovation scale, which consists of six questions, was modified from the works of Tunçdoğan et al. (2017), Zhou and Wu (2010).

According to the idea of dynamic capacities, an organisation's capacity to innovate and adapt to change goes beyond its regular tasks. This idea is regarded as one of the most effective explanations for how businesses use their resources and competencies to create and maintain a competitive advantage. Shin et al. (2023) highlight that the identification of an organisation's competitive edge and performance is contingent upon its internal resources and capabilities. The dynamic capacities hypothesis states that in response to changing circumstances, organisations must integrate and reallocate their resources and capabilities. Dynamic capabilities are actually thought of as a more comprehensive form of the resource-based perspective paradigm, which has grown in importance for businesses. Organisations can approach competitive advantage differently with the help of resource-based view theory (Ogutu et al., 2023). Furthermore, the dynamic capacity theory is built around this notion.

The foundation of digital leadership is the upper echelons hypothesis, which was formulated by Hambrick and Mason in 1984. According to this theory, the decisions made by leaders are influenced by their experiences, beliefs, and personalities. These decisions then have an impact on the performance of the organisation and the potential for innovation within it. The idea acts as a catalyst to investigate how the traits and experiences of leaders mould their decisions, views, and behaviours in ways that affect different organisational outcomes (Wang et al., 2022). Below are the research hypotheses developed under the auspices of resource-based view theory, upper echelons theory, and dynamic capabilities theory:

$H_1$: Employees' perception of digital leadership positively and significantly affects exploratory innovation.

$H_2$: Employees' perception of digital leadership positively and significantly influences digital organizational culture.

$H_3$: Employees' digital organizational culture positively and significantly influences exploratory innovation.

$H_4$: The mediating effect of digital organizational culture in the impact of employees' digital leadership on exploratory innovation behavior.

### 2.1.Findings

**Table 1. Distribution of Demographic Data of Research Participants**

| Variables | Subgroups | Frequency | Percentage (%) |
|---|---|---|---|
| Gender | Female | 148 | 35,7 |
| | Male | 266 | 64,3 |
| | 18-25 | 37 | 8,9 |
| Age | 26-33 | 220 | 53,1 |
| | 34-41 | 93 | 22,5 |
| | 42-49 | 38 | 9,2 |
| | 50 and over | 26 | 6,3 |
| Educational Background | Bachelor | 252 | 60,8 |
| | Master | 93 | 22,5 |
| | Doctorate | 69 | 16,7 |
| Marital Status | Single | 143 | 34,5 |
| | Married | 271 | 65,5 |
| | 0-17.000 ₺ | 13 | 3,1 |
| Monthly Income | 17.001-30.000₺ | 25 | 6,0 |
| | 30.001-43.000₺ | 86 | 20,8 |
| | 43.001-56.000₺ | 198 | 47,8 |
| | 56.001₺ and over | 92 | 22,2 |
| | Total | 414 | 100 |

According to Table 1, among the employees registered in the Computer Engineers Chamber, there are 148 (35,7%) women and 266 (64,3%) men; 53,1% of the employees are between the ages of 26-33, 60,8% are undergraduate graduates, 22,5% are master's graduates, 16,7% are doctorate graduates, 65,5% are married and 47,8% have a monthly income between 43.001-56.000 TL.

**Table 2. Reliability Analysis**

| Scale | Cronbach's Alpha |
|---|---|
| Digital Leadership | 0,973 |
| Digital Organizational Culture | 0,905 |
| Exploratory Innovation | 0,948 |

The reliability and validity analysis of the research was determined using Cronbach's Alpha. A Cronbach's Alpha value of 0,70 and above is considered reliable (Cronbach, 1951). For this reason, it was determined that the reliability of the scales was high.

**Table 3. KMO and Bartlett's Test Table**

| | | Digital Leadership | | Exploratory Innovation |
|---|---|---|---|---|
| Kaiser-Mayer-Olkin (KMO) | | 0,979 | 0,845 | 0,938 |
| Bartlett's Test of Sphericity | $X^2$ | 6640,280 | 1043,774 | 2235,389 |
| | df | 120 | 6 | 15 |
| | Sig. | 0.000 | 0.000 | 0.000 |

In Table 3, exploratory factor analysis was applied to test the validity of the scales. According to these results, the sample adequacy for the digital leadership scale was 0,979, for the digital organizational culture scale it was 0,845, and for exploratory innovation it was 0,938. Additionally, the results of Bartlett's sphericity tests are significant with $p = 0,000$ ($p < 0,05$). These test results indicate that the sample size is sufficient for factor analysis and the factor loadings of the scales are acceptable.

**Table 4. Dimensions and Factor Loadings of Digital Leadership**

| | Dimensions | | | | |
|---|---|---|---|---|---|
| **Digital Leadership** | **1** | **2** | **3** | **4** | **5** |
| Digital Leadership1 | 0,832 | | | | |
| Digital Leadership2 | 0,870 | | | | |
| Digital Leadership3 | 0,852 | | | | |
| Digital Leadership4 | 0,803 | | | | |
| Digital Leadership5 | | 0,786 | | | |
| Digital Leadership6 | | 0,818 | | | |
| Digital Leadership7 | | 0,881 | | | |
| Digital Leadership8 | | | 0,882 | | |
| Digital Leadership9 | | | 0,833 | | |
| Digital Leadership10 | | | 0,850 | | |
| Digital Leadership11 | | | | 0,858 | |
| Digital Leadership12 | | | | 0,821 | |
| Digital Leadership13 | | | | 0,798 | |
| Digital Leadership14 | | | | 0,866 | |
| Digital Leadership15 | | | | | 0,881 |
| Digital Leadership16 | | | | | 0,860 |

In Table 4, participants' digital leadership is clustered into five dimensions. By removing the 17th item from the scale, the factor loadings of the digital leadership scale have become acceptable.

**Table 5. Dimensions and Factor Loadings of Digital Organizational Culture**

| | **Dimension** |
|---|---|
| **Digital Organizational Culture** | 1 |
| Digital Organizational Culture1 | 0,867 |
| Digital Organizational Culture2 | 0,893 |
| Digital Organizational Culture3 | 0,884 |
| Digital Organizational Culture4 | 0,883 |

In Table 5, the factor loadings of participants' digital organizational culture are shown, and the factor loadings of this scale have become acceptable.

**Table 6. Dimensions and Factor Loadings of Exploratory Innovation**

| | **Dimension** |
|---|---|
| **Exploratory Innovation** | 1 |
| Exploratory Innovation1 | 0,896 |
| Exploratory Innovation2 | 0,891 |
| Exploratory Innovation3 | 0,897 |
| Exploratory Innovation4 | 0,888 |
| Exploratory Innovation5 | 0,899 |
| Exploratory Innovation6 | 0,875 |

In Table 6, the factor loadings of participants' exploratory innovation are shown, and the factor loadings of this scale have become acceptable.

**Table 7. Descriptive Statistics and Normality Test of Scales**

| | **Mean** | **Standard Deviation** | **Minimum** | **Maximum** | **Skewness** | **Kurtosis** |
|---|---|---|---|---|---|---|
| Digital Leadership | 3,37 | 1,03 | 1,00 | 5,00 | -0,457 | -0,507 |
| Digital Organizational Culture | 3,37 | 1,02 | 1,00 | 5,00 | -0,485 | -0,412 |
| Exploratory Innovation | 3,34 | 1,03 | 1,00 | 5,00 | -0465 | -0,438 |

The participants' levels of digital leadership, digital organizational culture, and exploratory innovation were found to be above average in the research. Some researchers assume that the data are normally distributed when the value obtained by dividing the kurtosis and skewness values by their standard error is less than 3 (Tabachnick and Fidell, 2007). According to the normality test, it was determined that the kurtosis and skewness values in the table show a normal distribution.

**Table 8. Multiple Correlation Analysis Between Variables**

| | Digital Leadership | Digital Organizational Culture | Exploratory Innovation |
|---|---|---|---|
| **Digital Leadership** | 1 | | |
| **Digital Organizational Culture** | 0,799** | 1 | |
| **Exploratory Innovation** | 0,760** | 0,887** | 1 |

The results of the correlation analysis regarding the relationship between the perception of digital leadership, digital organizational culture, and exploratory innovation of the employees registered in the Computer Engineers Chamber who participated in the study revealed that there is a significant and positive relationship between participants' perception of digital leadership and digital organizational culture at the level of 79,9% ($r(414)= 0,799$, $p< 0,01$). There is also a significant and positive relationship between participants' perception of digital leadership and exploratory innovation at the level of 76% ($r(414)= 0,760$, $p< 0,01$). Moreover, there is a significant and positive relationship between participants' digital organizational culture and exploratory innovation at the level of 88,7% ($r(414)= 0,887$, $p< 0,01$).

*2.1.1. Hierarchical Regression Analysis*

The mediation effect of digital organizational culture on the relationship between employees' perception of digital leadership and their exploratory innovation behavior was examined in the study of employees registered in the Computer Engineers Chamber. The model of the study is shown below:

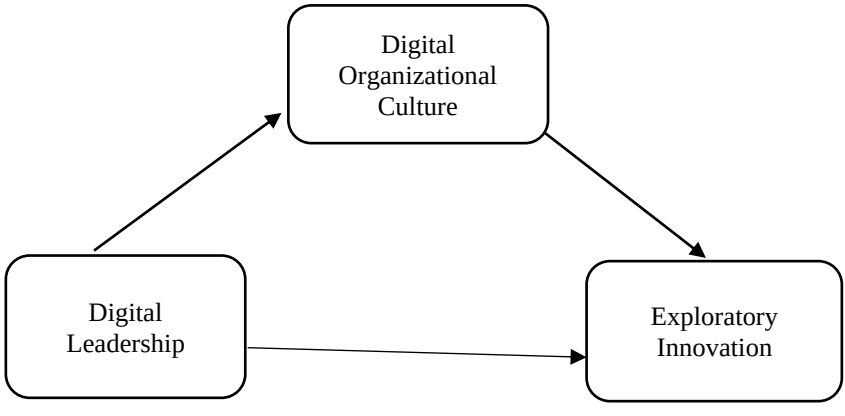


**Figure 1. Mediation Model**

The model in Figure 1 illustrates the mediating effect of digital organizational culture on the relationship between digital leadership perception and exploratory innovation behavior.

**Table 9. Testing the Effect of Digital Leadership Perception on Exploratory Innovation Behavior with Simple Regression Analysis**

| Dependent Variable | Independent Variable | B | Std. Error | β | t | p |
|---|---|---|---|---|---|---|
| Exploratory Innovation | Digital Leadership | 0,763 | 0,032 | 0,760 | 23,756 | 0,000 |
| $R^2$= 0,578 | F= 564,330 | Anova (p)=0,000 | Estimated Std. Error=0,67618 | Adjusted $R^2$=0,577 | | |

It was determined that 57,8% of the exploratory innovation behavior of employees registered in the Computer Engineers Chamber is explained by their perception of digital leadership. It was also found that the perception of digital leadership significantly and positively affects exploratory innovation behavior. Based on this result, hypothesis H1 is accepted. Additionally, when there is an increase of one unit in the standard deviation rate of employees' perception of digital leadership, there will be a 76% increase in the standard deviation of exploratory innovation behavior.

**Table 10. Testing the Effect of Digital Leadership Perception on Digital Organization Culture with Simple Regression Analysis**

| Dependent Variable | Independent Variable | B | Std. Error | β | t | p |
|---|---|---|---|---|---|---|
| Digital Organizational Culture | Digital Leadership | 0,793 | 0,029 | 0,799 | 26,954 | 0,000 |
| $R^2$= 0,638 | F= 726,510 | Anova (p)=0,000 | Estimated Std. Error=0,61899 | Adjusted $R^2$=0,637 | | |

It was found that 63,8% of the digital organization culture of employees registered in the Computer Engineers Chamber is explained by digital leadership. It was also determined that digital leadership significantly and positively affects digital organization culture. Therefore, hypothesis H2 is accepted. Additionally, when there is an increase of one unit in the standard deviation rate of employees' perception of digital leadership, there will be a 79,9% increase in the standard deviation of digital organization culture.

**Table 11. Testing the Effect of Digital Organizational Culture on Exploratory Innovation Behavior with Simple Regression Analysis**

| Dependent Variable | Independent Variable | B | Std. Error | β | t | p |
|---|---|---|---|---|---|---|
| Exploratory Innovation | Digital Organizational Culture | 0,897 | 0,023 | 0,887 | 39,002 | 0,000 |
| $R^2$= 0,787 | F= 1521,137 | Anova (p)= 0,000 | Estimated Std.Error=0,48054 | Adjusted $R^2$=0,786 | | |

It was found that 78.7% of the innovative behavior of employees registered in the Computer Engineers Chamber is explained by digital organizational culture. It was determined that digital organizational culture has a significant and positive effect on innovative behavior. As a result of the analysis, hypothesis H3 is supported. Additionally, when there is an increase of one unit in the standard deviation rate of employees' innovative behavior, there will be an 88.7% increase in the standard deviation of digital organizational culture.

**Table 12. Mediation Test**

| Dependent Variable | Independent Variable | B | Std. Error | β | t | p |
|---|---|---|---|---|---|---|
| Exploratory Innovation | Digital Leadership | 0,143 | 0,037 | 0,143 | 3,838 | 0,000 |
| | Digital Organizational Culture | 0,782 | 0,038 | 0,773 | 20,784 | 0,000 |
| $R^2$= 0,794 | F= 793,289 | Anova (p)=0,000 | Estimated Std.Error=0,47272 | Adjusted $R^2$=0,793 | | |

It was found that 79,4% of the innovative behavior of employees registered in the Computer Engineers Chamber is explained by digital leadership and digital organizational culture. In the model, it was determined that 14,3% of employees' innovative behavior is explained by digital leadership, and 77,3% of employees' innovative behavior is explained by digital organizational culture. The expressed $R^2$ values increased to 79%, therefore it was determined that there is a partial mediation role of digital organizational culture in the effect of employees' digital leadership perception on innovative behavior, and hypothesis H4 is accepted.

## 3. RESULTS

Regarding potential changes in the current environment, a global perspective, digital literacy, ongoing self-improvement, teamwork, participative leadership, and resolve are critical attributes for many organisations. Education is the main prerequisite for

capturing digital leadership in organisations and ensuring the environment for digital transformation. Therefore, a thorough understanding of both technology and organisational operations is required for an organisation and an information technology specialist to realise digital transformation. To achieve a successful digital transformation in their organisations, successful digital leaders must first be able to bring all of the staff members together. The willingness to make the required adjustments is a prerequisite for successful digital executives who want to realise their organization's future vision.

Effective leaders must first adjust to these changes in order to be able to convince their staff members about potential adjustments. Leaders who avoid taking chances, stick to the tried-and-true methods of doing business, and are reluctant to adopt new technologies are unlikely to succeed. Therefore, organisations must showcase creative and proactive digital leaders in order to demonstrate a successful performance of digital transformation in demanding competitive conditions. Enhancing the digital experience and building a solid digital culture are critical tasks for organisations. In order to foster a digital culture, it is necessary to guarantee effective communication and collaboration. Employees can interact and work together more productively for their teams and companies when they use digital platforms and tools. Better decision-making and higher output may result from this.

A crucial component of the digital transformation process is digital culture. Although resistance to change is common, when it is handled incorrectly, it can cause a lot of issues. Maintaining established values that benefit the organisation is crucial. In this approach, established values will be upheld in addition to the acquisition of new, more contemporary ones. Consequently, it's critical to promote innovative practices by utilising a variety of instruments to establish a digital culture. In order for them to question the status quo and aid in the development of new ideas, employees must feel empowered to generate their own ideas. Customer-focused ideas should be rewarded, data should be used to inform internal choices, management should be trusted more, and an environment conducive to a digital organisational culture should be established. When establishing a digital organisational culture, it's crucial to find individuals or groups of individuals who are passionate about utilising digital tools. It is important to take into account not only the duties and talents of employees, but also their personal qualities. Teams that are more inventive, flexible, and self-organizing typically perform better. Building a digital organisational culture requires providing sufficient digital tools, tracking advancements made inside the company, and evaluating accomplishments.

A digital organisational culture must be established by integrating the digital business processes and technologies of an organisation with its service activities. This is a significant indication that the direction of the future will be towards digitization. Organisations need to be able to take the lead in change, view every person as a stakeholder, and aim to move away from traditional techniques in order to survive in the digital world of technology. Thus, fostering exploratory innovation in conjunction

with digital leadership will facilitate the development of a digital organisational culture environment and present chances for significant transformations. Digital leadership is crucial for both exploratory innovation and the environment of digital organisational culture, according to this study, which examined the mediating function of digital organisational culture in the relationship between digital leadership and exploratory innovation. As a result, suggestions regarding the significance of digital leadership have been provided for future researchers based on the literature and analytical results. One of the research's primary limitations is that it was carried out on a limited number of computer engineers chamber employees. By conducting the research again in various industries, places, and with various factors, it will be possible to generalise the impact of digital leadership on exploratory innovation in subsequent studies. Qualitative approaches can also help future research.

## 4. DISCUSSION

The study sought to determine the associations among personnel enrolled with the Computer Engineers Chamber in terms of their perceptions of digital leadership, attitudes towards digital organisational culture, and exploratory innovation behaviour. It was found that digital leadership significantly influences exploratory innovation as a consequence of the hierarchical regression analysis carried out in this particular situation. Similar outcomes were seen in Wang et al.'s (2022) study, which included 489 workers from a Chinese company. Additionally, Benitez et al. (2022) discovered that digital leadership has a significant impact on exploratory innovation. Digital organisational culture is significantly impacted by digital leadership, according to the results of the second step of hierarchical regression analysis. Likewise, Shin et al.'s study from 2023, which involved 149 workers from a South Korean company, found that digital leadership has an impact on digital organisational culture. In a study by Puliwarna et al. (2023) with 445 employees of 11 maritime companies in Indonesia and in a study by Muniroh et al. (2022) with 306 employees of a firm in Indonesia, it was also concluded that digital leadership affects digital organisational culture. These findings are consistent with the findings of Wang et al. (2022). Exploratory innovation is significantly impacted by digital organisational culture, according to the results of the third level of hierarchical regression analysis. Studies by Wang et al. (2022), Scaliza et al. (2022), Imron et al. (2021), and Velyako et al. (2023) produced findings that were similar to this one. The effect of digital leadership on exploratory innovation is mediated by digital organisational culture, according to the findings of the last stage of hierarchical regression analysis. This outcome is in line with the research findings of Wang et al. (2022).

In today's fast-paced corporate climate, organisations must maintain a digital culture in order to stay inventive, competitive, and adaptive. For organisations, maintaining this culture and seeing to it that it evolves over time is an important accomplishment. A digital culture can be preserved and improved with the aid of a few essential tactics and procedures. Digital cultures support exceptional internal and external collaboration. As a result, in order to collaborate on crucial strategic projects, organisations must do away with functional divisions and form cross-functional teams

comprising members of all organisational functions. An integrated perspective facilitates quicker marketing implementation and lessens misunderstandings and internal disagreements. Virtual environments should be promoted to foster collaboration in addition to office spaces. In order to foster ground-breaking innovations, it is critical for organisations to respond swiftly and nimbly, assembling teams nearer to their customers. Additionally, it is crucial to hunt for partners or recently created enterprises in order to gain faster market access, as well as to work with customers to co-create products or services. The formation of a digital organisational culture requires a number of strategies, including soliciting employee feedback, facilitating employee contributions that address customer or internal organisational issues, rewarding employees for their creative ideas, emphasising the digital skills the organisation needs in hiring and interviewing, examining organisations that excel in digital innovation, and decentralising decision-making to lower levels of the organisation to allow managers and staff to react to change more quickly. Establishing a digital organisational culture and learning the best leadership style are also critical in order to facilitate this shift. It's critical to find staff members who are passionate about utilising digital tools. It is imperative to take into account the personal traits of employees in addition to their positions and competencies. When an organisation wants to adopt a digital organisational culture, it should take into account that employees should be able to utilise and create digital tools that complement and improve their abilities. A digital organisational culture will probably take time to implement, requiring commitment and thoughtful consideration of all options. Nonetheless, an empowered workforce that takes personal accountability for the success of the group as a whole will result in a more successful and productive company when implemented properly.

## GENİŞLETİLMİŞ ÖZET
## DİJİTAL LİDERLİĞİN KEŞFEDİCİ İNOVASYON ÜZERİNDEKİ ETKİSİNDE DİJİTAL ÖRGÜT KÜLTÜRÜNÜN ARACILIK ROLÜ

### 1. GİRİŞ

Çalışmada, bilgisayar mühendisleri odasına bağlı çalışanların dijital liderliğin müşteri ve pazar ihtiyaçlarını karşılamak için yenilikçi tasarımlar ve yaratıcı yollara ihtiyaç duyulduğunu belirten keşfedici inovasyon üzerindeki etkisinde dijital örgüt kültürünün aracılık rolü değerlendirilmiştir. Bu kapsamda çağa ayak uyduran yeni kavramlardan olan dijital liderlik, "liderlerin dijitalleşme süreci için açık ve anlamlı bir vizyon oluşturma yeteneği ve bunu gerçekleştirmek için stratejiler uygulama yeteneği" olarak açıklanmıştır (Larjovuori, R.L. vd., 2016). Çalışmada ele alınan örgüt kültürü ise bir örgütün işini yürütme biçimini tanımlayan karmaşık değerler, inançlar, varsayımlar ve semboller dizisi şeklinde ifade edilebilir (Barney, 1986). vurgulamaktadır. Örgütlerde yeni ürünlerin ve/veya hizmetlerin yaratılması ve yeni bilgilerin sunulması, bilgi öğelerinin yeni kombinasyonlarının ortaya konulması konusundaki dinamik yetenek keşfedici inovasyonu açıklamaktadır. Bu değişkenler

arasındaki ilişkilerin incelenmesi ile literatürdeki boşluğa ışık tutulacağı düşünülmektedir.

## 2. YÖNTEM

Araştırmanın evrenini, 2022 yılı itibari ile bilgisayar mühendisleri odasına kayıtlı olan 7.023 çalışan oluşturmaktadır. Araştırmanın örneklemini bilgisayar mühendisleri odasına kayıtlı olan 414 çalışan oluşturmaktadır. Bu çalışmada basit tesadüfi örnekleme yöntemi kullanılarak anket çalışması yapılmıştır. Araştırmada kullanılan dijital liderlik ölçeği için Zhu (2015) tarafından geliştirilen ve ampirik çalışmalarda birkaç kez kullanılan yaratıcılık, düşünme ve sorgulama, merak, derin bilgi ve küresel vizyon ve iş birliği olmak üzere beş boyutu içeren ve on yedi maddeden oluşan ölçek kullanılmıştır. Dijital örgüt kültürünü değerlendirmek için Martínez-Caro vd. (2020) çalışmasındaki ölçekten faydalanılmıştır ve bu ölçek dört maddeden oluşur. Keşfedici inovasyon ölçeği, Zhou ve Wu (2010)'nun çalışmalarından ve Tunçdoğan vd. (2017)'nin çalışmalarından uyarlanmıştır ve bu ölçek altı maddeden oluşur. Araştırmada elde edilen veriler paket programlar yardımıyla analiz edilmiştir. Araştırma kapsamında test edilen hipotezlere aşağıda yer verilmiştir.

H1: Çalışanların dijital liderliği keşfedici inovasyonu pozitif ve anlamlı yönde etkilemektedir.

H2: Çalışanların dijital liderliği dijital organizasyon kültürünü pozitif ve anlamlı yönde etkilemektedir.

H3: Çalışanların dijital organizasyon kültürü keşfedici inovasyonu pozitif ve anlamlı yönde etkilemektedir.

H4: Çalışanların dijital liderliğin keşfedici inovasyon üzerindeki etkisinde dijital organizasyon kültürünün aracılık etkisi vardır.

## 3. BULGULAR

Araştırmaya katılan bilgisayar mühendisleri odasına kayıtlı olan çalışanlardan; kadın sayısının 148 (%35.7) ve erkek sayısının 266 (%64.3) olduğu; çalışanların %53.1'inin 26-33 yaş arasında olduğu, %60.8'inin lisans mezunu, %22.5'inin yüksek lisans mezunu, %16.7'sinin doktora mezunu, %65.5'inin evli olduğu, %47.8'inin 43.001-56.000TL aylık gelirinin olduğu belirlenmiştir. Araştırmaya katılanların dijital liderlik, dijital organizasyon kültürü ve keşfedici inovasyon düzeylerinin ortalamanın üzerinde olduğu saptanmıştır. Elde edilen verilerin normal dağılım gösterdiği tespit edilmiştir. Çalışmadaki ölçeklerin güvenirliğinin yüksek olduğu belirlenmiştir. Ölçeklerin geçerliliğinin test edilmesi için keşfedici faktör analizi uygulanmıştır ve elde edilen sonuçlara göre; dijital liderlik ölçeğinin örneklem yeterliliği 0.979, dijital organizasyon kültürünün örneklem yeterliliği 0.845 ve keşfedici inovasyonun örneklem yeterliliği 0.938 olarak belirlenmiştir. Bununla birlikte Bartlett's küresellik testlerinin sonuçlarının da $p = 0,000$ ve anlamlıdır ($p<0,05$). Bu test sonuçları faktör analizi için örneklem büyüklüğünün yeterli sayıda ve ölçeklerin faktör yükleri açısından kabul edilebilir olduğu söylenebilir. Araştırmaya katılan bilgisayar mühendisleri odasına kayıtlı olan çalışanların dijital liderlik algısı, dijital

organizasyon kültürü ve keşfedici inovasyonu arasındaki ilişkiyi ele alan korelasyon analizi sonucunda; katılımcıların dijital liderlik algısı ile dijital liderlik algısı arasında %79.9 düzeyinde anlamlı ve pozitif yönlü ilişkinin olduğu ($r(414)= 0.799$, $p< 0.01$), katılımcıların dijital liderlik algısı ile keşfedici inovasyonu arasında %76 düzeyinde anlamlı ve pozitif yönlü ilişkinin olduğu ($r(414)= 0.760$, $p< 0.01$), katılımcıların dijital organizasyon kültürü ile ve keşfedici inovasyonu arasında %88.7 düzeyinde anlamlı ve pozitif yönde ilişkinin olduğu ($r(414)= 0.887$, $p< 0.01$) belirlenmiştir.

## 4. TARTIŞMA

Araştırma, bilgisayar mühendisleri odası'na kayıtlı çalışanların dijital liderlik algıları, dijital organizasyon kültürüne yönelik tutumları ve keşfedici yenilik davranışları arasındaki ilişkilerin belirlenmesi amaçlanmıştır. Bu kapsamda gerçekleştirilen hiyerarşik regresyon analizi sonucunda, dijital liderliğin keşfedici yeniliği önemli ölçüde etkilediği bulunmuştur. Benzer sonuçlar Wang ve arkadaşlarının (2022) Çinli bir şirkette çalışan 489 işçiyi kapsayan çalışmasında da görüldü. Ayrıca Benitez ve arkadaşları (2022), dijital liderliğin keşifsel inovasyon üzerinde önemli bir etkiye sahip olduğunu belirlemiştir. Hiyerarşik regresyon analizinin ikinci adımının sonuçlarına göre, dijital organizasyon kültürü dijital liderlikten önemli ölçüde etkilenmektedir. Benzer şekilde Shin ve arkadaşlarının Güney Koreli bir şirketten 149 çalışanın katıldığı 2023 tarihli araştırması, dijital liderliğin dijital organizasyon kültürü üzerinde etkisi olduğunu tespit etmiştir. Muniroh ve arkadaşlarının (2022) yürüttükleri Endonezya'daki bir firmanın 306 çalışanıyla yaptıkları çalışmada dijital liderliğin dijital örgüt kültürünü etkilediği sonucuna ulaşılmıştır. Bu bulgular Wang ve arkadaşlarının bulgularıyla da tutarlıdır (2022). Hiyerarşik regresyon analizinin üçüncü düzeyinin sonuçlarına göre, keşifsel inovasyon dijital organizasyon kültüründen önemli ölçüde etkilenmektedir. Wang ve arkadaşlarının çalışmaları (2022), Scaliza ve ve arkadaşları (2022), Imron ve ve arkadaşları (2021), Velyako ve arkadaşları (2023) da buna benzer bulgular üretmiştir. Hiyerarşik regresyon analizinin son aşamasının bulgularına göre, dijital liderliğin keşifsel inovasyon üzerindeki etkisinde dijital organizasyon kültürünün aracılık ettiği belirlenmiştir. Bu sonuç, Wang ve arkadaşları (2022)'nın araştırma bulgularıyla uyumluluk gösterir.

## SONUÇ

Araştırmanın sonucunda; bilgisayar mühendisleri odasına kayıtlı olan çalışanların keşfedici inovasyon davranışının %57.8'inin dijital liderlik algısı ile açıklandığı belirlenmiştir. Dijital liderlik algısının keşfedici inovasyon davranışını anlamlı ve olumlu yönde etkilediği belirlenmiştir. Bu sonuca göre, H1 hipotezi kabul edilmiştir. Ayrıca çalışanların dijital liderlik algısında bir birim standart sapma oranında artış olduğunda keşfedici inovasyon davranışının standart sapmasında %76'lık artış görülecektir. Bilgisayar mühendisleri odasına kayıtlı olan çalışanların dijital organizasyon kültürünün %63.8'inin dijital liderlik ile açıklandığı saptanmıştır. Dijital liderliğin dijital organizasyon kültürünü anlamlı ve olumlu yönde etkilediği tespit edilmiştir. Bu sonuca göre, H2 hipotezi kabul edilmiştir. Bununla birlikte,

çalışanların dijital liderlik algısında bir birim standart sapma oranında artış olduğunda dijital organizasyon kültürünün standart sapmasında %79.9'luk artış görülecektir. Dijital organizasyon kültürünün keşfedici inovasyon davranışı üzerinde anlamlı ve pozitif yönlü bir etkisinin olduğu saptanmıştır. Analiz neticesinde H3 hipotezi desteklenmiştir. Bilgisayar mühendisleri odasına kayıtlı olan çalışanların keşfedici inovasyonunun %79.4'ünün dijital liderlik ve dijital organizasyon kültürü ile açıklandığı belirlenmiştir. Modeldeki çalışanların keşfedici inovasyonun %14.3'ünün dijital liderlik ile açıklandığı ve çalışanların keşfedici inovasyonun %77.3'ünün dijital organizasyon kültürü ile açıklandığı sonucuna varılmıştır. İfade edilen $R^2$ değerleri %79'a yükseldiği için çalışanların dijital liderlik algısının keşfedici inovasyon üzerindeki etkisinde dijital organizasyon kültürünün kısmi aracılık rolünün olduğu belirlenmiş ve H4 hipotezi kabul edilmiştir. Bu kapsamda test edilen bütün hipotezlerin desteklendiği sonucuna varılmıştır.

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