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Research Article

## HAS TECHNO STRESS INCREASED IN THE EMPLOYEES OF COMPANIES THAT APPLIED DIGITAL STRATEGIES WITH THE PANDEMIC PROCESS?

Pandemi Süreci İle Dijitalleşme Stratejileri Uygulayan Firma Çalışanlarında Tekno Stres Arttı Mı?

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### ABSTRACT

The aim of this study is to examine the techno stress that the digital transformation, which accelerates with the pandemic process in the digitalizing business world, can create in employees. The relationship between the two variables was assumed to be positive and this relationship was confirmed by the study. Factor analysis was applied to the variables without examining the relationship between the variables, and factors were obtained both parallel to and different from the literature. Employee digitalization is one of these sub-factors that give meaningful results. Digitalization of employees rather than the organization raises the level of techno stress. Again, employee digitalization affects techno-development, which is included in techno stress and is only detected in this study.

Except for the hypothesis test, the differences of the variables in terms of demographic groups were examined. A significant difference was found between techno stress and techno-development in terms of age and seniority. Accordingly, as age and seniority progress, the level of these variables first decreases, and after a certain period of time, an increase is observed. In addition, the sector where digitalization is felt the most is food and the sector where techno insecurity is perceived at the highest level is banking.

The study was carried out by reaching a total of 300 white-collar employees through a digital research panel. The generalizability of the research results is valid, as the selected employees are randomly selected from a representative sample of Turkey. This study focuses on the impact of digitalization on employees with the effect of the pandemic. In future studies, it is thought to pay attention to the positive effects of digitalization as well as the negative effects.

**Key words:** Techno stress, digital strategies, digital transformation

### ÖZET

Bu çalışmanın amacı dijitalleşen iş dünyasında pandemi süreciyle birlikte hızlanan dijital dönüşümün çalışanlarda yaratabileceği teknostresi incelemektir. İki değişen arasındaki ilişki pozitif varsayılmış ve çalışma ile bu ilişki doğrulanmıştır. Değişkenler arası ilişki incelenmeden değişkenlere faktör analizi uygulanmış ve literatüre hem paralel hem de ondan farklı olarak faktörler elde edilmiştir. Bu alt faktörlerden anlamlı sonuç veren çalışan dijitalleşmesidir. Örgütten ziyade çalışanların dijitalleşmesi teknostres seviyesini yükseltmektedir. Yine çalışan dijitalleşmesi, teknostres içinde yer alan ve sadece bu çalışmada tespit edilen tekno gelişimi etkilemektedir.

Hipotez testi dışında değişkenlerin demografik gruplar açısından farkı incelenmiştir. Teknostresin ve tekno gelişimin yaş ve iş kıdemi açısından anlamlı bir farkı tespit edilmiştir. Buna göre yaş ve kıdem süresi ilerledikçe önce bu değişkenlerin seviyesi azalmakta, belli bir süreden sonra ise artışı gözlemlenmektedir. Ayrıca dijitalleşmenin en fazla hissedildiği sektör gıda ve tekno güvensizliğin en yüksek düzeyde algılandığı sektör ise bankacılıktır.

Çalışma dijital bir araştırma panel üzerinden toplamda 300 beyaz yakalı çalışana erişilerek gerçekleştirilmiştir. Seçilen çalışanlar Türkiye temsili bir örneklem üzerinden rassal olarak seçildiği için araştırma sonuçlarının genellenebilirliği geçerli düzeydedir. Bu çalışma pandemi etkisiyle dijitalleşmenin çalışanlarda yarattığı etkiye odaklanmaktadır. Gelecek çalışmalarda dijitalleşmenin olumsuz etkilerinin yanı sıra olumlu etkilerine dikkat verilmesi düşünülmektedir.

**Anahtar Kelimeler:** Tekno stres, dijitalleşme stratejileri, dijital dönüşüm.

### 1. INTRODUCTION

Due to the effect of COVID-19 pandemic there is a concept that business life gradually attaches more importance to: digitalization. When companies had to work remotely, they realized how important the steps towards digitalization were. Instead of seeing digitalization as a cost item, they started to consider it as an important investment that will increase their competitiveness in the future. In the pandemic, which suddenly

affected everyone's way of life, companies' needs to make a lot of effort not to lose their quantitative and qualitative resources. At the same time, it is not easy for employees to adapt to the new way of working. The digitalization strategy, which did not find much place among corporate strategies until this period, has become one of the critical strategies that should be planned for companies from this point on. The level of awareness, skills and competencies of employees about digitalization is the key factor in the implementation of these digital strategies in companies that have to rapidly transition to digitalization. However, there are many studies on the impact of digitalization on companies; working conditions with new technologies, including balancing work and family life, job stress interventions, or other aspects of the employees' well-being (Christensen, Finne, Garde, Nielsen, Sørensen, Vleeshouwes, 2020: 35). Hence, there is a need to clarify how digitalization influences employees.

The world's rapid change and transformation in the field of technology; organizations to show sustainability and development is trying to adapt to this movement. The most strategic for its employees, who are among its assets, to cope with this situation or to synchronize may have some consequences. Stress is a response to stimuli arising from internal and external environmental conditions in individuals. It is an adaptive response. Due to the double effect of stress; when the stress is at the appropriate level and intensity, it develops and experiences the individual. It is a stimulant that causes it to win. When anxieties turn into tension in the individual, stress causes negative consequences (Barutçugil, 2002: 144). Particularly with the perception of globalization, the concept of competitiveness, which has become even more important, emerges in the field and becomes an integral part of life (Ekrem and Köseoğlu, 2014: 52). With the rapid technological changes occurring today, to keep up with the developments in personal and organizational life and individuals trying to adapt to techno stress.

This study explores techno stress and its dimensions, examining the relationship with possible or negative effects on employees. Although there are many studies in the literature on the working styles that have developed with digitalization after covid-19, the studies on how the employees of the companies applying the digitalization strategy are affected by this variable are limited. This study will fill this gap in the literature, as well as draw attention to the impact of companies on employees when they switch to rapid digitalization in the post-pandemic period.

In the theoretical framework part, the variables that are the subject of the research are defined. In the subtitle of the first part of the study includes how digitalization has increased after the pandemic are, what are the effects in business life. In the second subtitle, the definition of the concept of "techno stress" and its subtitles. The hypotheses created to test the relationships between the variables are presented in the third sub-title. In the methodology part, the research sample and the measurement scales are explained. In the conclusion and discussion section, the relationship between the variables is interpreted in terms of findings as well as the limitations of the research and suggestions for the future study.

## **2. THEORETICAL FRAMEWORK**

### **2.1. Digital Strategies after Pandemic Covid-19**

Countries are extremely strict to prevent the spread of the COVID-19 Pandemic. They have to almost completely cease economic and social life. The emergence of the pandemic almost all over the world education, social activities in addition to areas such as working life, transportation and commerce, particularly health deeply affected the industry. The economic system has collapsed in many European countries, along with it; states must ensure the continuation of the economic and social life. Countries have closed borders, broke off the integration. Most countries have tried to take similar precautions within themselves, very common and restrictive in order to prevent physical contact and intimacy of people. Sectors that can continue their activities provided that they comply with the hygiene and social distance to a certain extent; production, transportation, and sales related to the supply of basic needs such as food, communication, electricity, water, natural gas and transportation, etc. In addition, with the help of digital technologies, remote services such as e-education, e-commerce continued in this period and even increased its economic activity. As it's clearly seen, the crisis caused by COVID-19 is completely different from other crises. It is people oriented. According to Table 1., Yükseler (2020) claims that pandemic negatively effects on the employment workforce.

Table 1. Forecast on the Employment Impact of Covid-19 Pandemic

Impact Category	The Number of Affected Workforce (.000)
Suspension of Business Operation	1.350
Limitation of Transport	450
Curfew applied to the 65+ age group	850
Curfew applied to the 20- age group	500
Job loss of other service sectors	1.900
Job loss in the private sector manufacturing industry	550

Source: Yükseler Z., (2020), The effect of the Covid-19 on employment and growth.

[https://www.researchgate.net/publication/340511319\\_KORONAVIRUS\\_COVID\\_19\\_SALGINININ\\_ISTIHDA\\_M\\_VE\\_BUYUMEYE\\_ETKISI](https://www.researchgate.net/publication/340511319_KORONAVIRUS_COVID_19_SALGINININ_ISTIHDA_M_VE_BUYUMEYE_ETKISI)

According to Twilio (2020) Covid-19 Digital Engagement Report; internationally, 97% of business executives believe that the digital transformation of their company is accelerated by pandemic, and one out of three companies started using online channels for the first time. According to McKinsey’s definition “digitalization as actions using digital technologies that aim to increase productivity and accelerate economic growth” ([http://spkurdyumov.ru/digital\\_economy](http://spkurdyumov.ru/digital_economy)). In McKinsey’s report, there are several ways to improve productivity in the enterprise as a result of the use of digital Technologies (Table 2.).

Table 2. Ways to Improve Productivity in the Enterprise as a Result of the Use of Digital Technologies

Direction of productivity improvement	Characteristic
Process optimization	Digital technologies increase the efficiency of enterprise value chain management
Access to new markets	Increase the ability to access and occupy individual niches. Possibility of global market coverage. Automation of research data on the needs of customers
Innovative product	Increase the efficiency of research processes in the field of marketing, advertising and product promotion. New models of process management. New methods of interaction with clients
The increase in professional activity	Development of remote work and employment. Specialization as part of the technological process

Source: Cyfrowa Polska (2016) McKinsey & Company, Forbes Polska Raport

As reported in Tübisad’s (Turkey Informatics Industry Association) current research; Turkey Digital Transformation Index 2019 and for 2020, respectively it was calculated as 2.94 and 3.06 out of 5. The smallest value is 1, the highest value is 5. Turkey's grade is average from 2019 to 2020 although there was an improvement of 4%, this average performance Turkey's digital in terms of adaptation to the transformation that there is a considerable distance. Turkey's digital transformation factors that reduce performance key component is “qualification” component. The Accenture Digitalization Index study also analyzed the impact of digitalization on the profitability of companies. Accordingly, every 10-point increase in the maximum Digitalization Index score of 100 points means an additional 1.5% profit before interest and taxes (EBIT) margin, on average, for a company in Turkey (<http://tbv.org.tr/en-dijital-100-endeks-calismasi/>). However, does digitalization, which contributes positively to the financial outputs of companies, also positively affects their work?

## 2.2. Techno Stress

Techno stress is defined as the type of stress (Chiappetta 2017: 2). Similarly, companies use techno stress due to their dependence on information and communication technology complexity and changes of the individual physical, behavioral, and psychological inability to adapt. According to Tarafdar, Pullins, and Ragu-Nathan (2011:3) techno stress is the result of individuals' use of information systems organizational identification. As a result of often new technologies are included in the system; it is thought that the stress level on the individual may increase in work environments. Although it makes it mandatory to do so (Laspinas, 2015: 205), it also requires users to causes anxiety and fear. According to researchers (Clark and Kalin 1996: 30, Weil and Rosen 1997: 180, Brillhart 2004: 302) this situation; expressed with the concept of techno stress. Techno stress consists of five dimensions: these are techno-workload, techno-uncertainty, techno-invasion, techno complexity and techno-insecurity (Tarafdar et all 2011:106).

### Techno Workload

Technological changes generally increase the work intensity, so the employee needs to increase mental effort per task, and unit time (Green and McIntosh, 2001: 291). Notably the employee at different levels of using

information and communication is trying to absorb a large amount of information. Growth of knowledge causes a decrease of attention. The misconception that too much information affects short-term memory. It emerges spontaneously when the limit of information it can hold in a unit of time is exceeded (Sunstein & Thaler, 2012: 32). Hence, some of the technologies acquired in order to increase the efficiency and productivity of the employee; situations cause individuals to be overwhelmed by excessive information flow and excessive workload (Cowan, Bulat and Rifka, 2011: 165).

### Techno Uncertainty

The individual tends to eliminate uncertainty to train and develop him/her in order to keep up with changing information technologies. No matter how perfectly this process is supported by the organization, to keep up with this endless change constantly keep the mind of the individual and gradually has become disturbing issue (Tarafdar, Tu, Ragu-nathan and Ragu-nathan, 2007: 301). Constantly changing and developing technologies, opportunity for users to specialize and dominate a system does not recognize. In this case, users can use a new system they have just met and the information constantly needs updates. Even if users are willing for this situation in the first period in the future, it loses its desires due to continuous updates.

### Techno-Invasion

Due to the opportunity provided by the digitalization of the employees and individuals of the organization, makes them accessible anywhere and anytime. Against this situation individuals are expanding to include their family life and social life. Therefore, individuals feel that technology occupies their personal time and brings about stress.

### Techno Complexity

Differentiating business methods with the help of digitalization causes changes in responsibilities and abilities, and as a result, the complexity of the environment is increasing. This complexity is more cognitive during work. Digital resources as well as time, effort and effort to learn to use new systems cause the consumption of cognitive resources (Lehto and Buck, 2008: 124). New technologies often increase complexity, both individually and organizationally.

### Techno-Insecurity

With the widespread and continuous development of digitalization in companies, the way of doing business is changing. Employees have to improve themselves against changing ways of doing business. Although digitalization provides convenience in the way of doing business, the pressure is increasing on the employees who are constantly adapting to new applications. The increasingly digitalized work environment makes the employee feel unnecessary.

## **2.3. Digitalization and Techno stress**

In business life, employees integrate advanced and innovative information technology in organizations. They are gradually exposed to institutional working conditions that are becoming more complex. Information technology on individuals causes techno stress (Sellberg and Susi, 2013: 187). In today's world, where information spreads rapidly, techno stress is a situation that arises in overloading the individual. Brod (1984: 24) stated that the most important symptom of techno stress in users is anxiety against computer technologies. Other symptoms by expressing anxiety towards technology; muscle cramps, headaches and insomnia. According to Champion (1988: 54), the main symptoms of techno stress are; panic, anxiety, resistance, intolerance, perfectionism, mental fatigue and physical. Techno stress created by new technologies has triggers dissatisfaction, mental fatigue, physical ailments and fear of losing a job; decrease in the commitment of individuals to the organization, decrease in job satisfaction and increase in work efficiency.

H1: The level of digitalization in an organization affects positively the level of techno stress that employees perceive.

Atanasoff and Venable (2017: 327) emphasized that the increasing dependence of organizations on information and communication technology causes techno stress. Wang, Shu, and Tu's (2008: 3004) study shows that directing the individual to learn and use computer technology psychologically and emotionally causes fear, anxiety and reluctance in the individual. Individuals in the face of these developing technologies and innovations, they have to add new competencies to themselves in understanding technology. The expansion of technological innovations and the positive increase in its sphere of influence. By internalizing this situation, users constantly feel themselves keeping up with technology. It has become a necessity to renew

them and keep them up to date. In this situation, individuals caused a negative pressure and effects on (Çetin and Bülbül, 2017: 23; Khan and Rehman, 2013: 9-13). Continuously developing and changing technology, trainings on this subject insufficient, increasing workload with the facilitation of technology. It is stated that problems and technical inadequacies cause technological stress (Ennis, 2005: 11).

H<sub>1a</sub>: Increasing digitalization affects techno workload in a positive way.

In today's information society, the technological increase beyond expectations. developments also cause us to live in a world full of ever-increasing demands. Although technology has been promoted and recognized as a time saver, this has led to an increase in the expectations that must be fulfilled in the workplace. According to Yener's study (2008: 85), the information load that comes with digitalization, the development of excessive dependence on technology, lack of motivation and work-related roles in the work environment cause ambiguity.

H<sub>2a</sub>: As digitalization increasing, employees are affected by it and their perception of techno invasion increases too.

H<sub>3a</sub>: Digitalization causes employees to perceive techno insecurity.

As a result of digitalization, individuals to continuously improve their technological skills and competencies (Laspinas, 2015: 207). In today's competitive society, information and communication intensive use of technologies; mental, psychological and interaction of social characteristics and users with information and communication technologies requires consideration of their compliance (Kalay, Şimşek, and Oğrak, 2009). In addition, information and communication technologies have a complex structure that is constantly changing and developing tasks that need to be done in the workplace in increasingly complex ways. Information used by techno complexity organizations is inadequate in terms of their technical skills due to the complexity of their technology (Ioannou, 2018: 19-20).

H<sub>4a</sub>: Digitalization of an organization contributes to techno complexity.

H<sub>5a</sub>: Digitalization of an organization contributes to techno uncertainty.

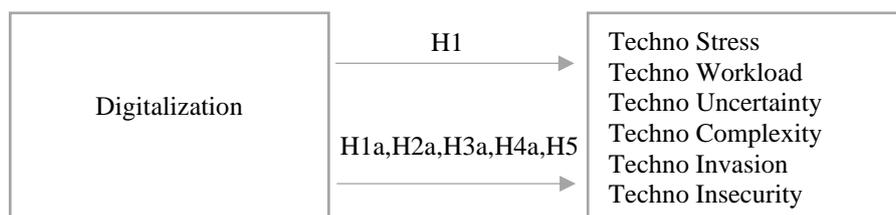


Figure 1. Research Model

### 3. METHODOLOGY

Since the purpose of the study is to test the effect of organization's digital maturity on techno stress that employees go through, the study was conducted on white collar employees. A total of 300 employees were reached via a private digital consumer panel. This panel consists of nearly 15.000 panelists whose 90% is full time employee distributed in 12 statistical regions of Turkey (NUTS 1). Accordingly the sample of the study consists of these employees from different regions and sectors in Turkey who were randomly selected. No quota was applied during data collection except the condition of working status. Since the research panel reflects representative demographic distributions of the country and the sample was randomly selected among the panelist, in this case the research results can be projected to Turkish business.

The sample contains 65% male and 35% female employees. The average age of the sample is 33. 65% of these employees are graduates, while 13% are post graduates and the rest is equally distributed as vocational and high school graduates. Averagely these employees have actively been in work life for 5-6 years. Lastly the top three sectors that participants join from are banking (%16), informatics (%13) and education (%12).

With the aim of meeting the codes of research ethic, the participants were asked to clarify their approval to attend to the study before answering the questionnaire. The survey contained three parts as demographics, digital maturity assessment and techno stress scale. The scales were taken as 5-point Likert scale.

For the digitalization, Fraunhofer Digital Transformation Assessment is used. Researchers at Fraunhofer IPK are currently conducting a study to support companies in determining their individual status of digital transformation. With this purpose, they have created this assessment tool where companies can use it as a tool to assess themselves to see to what extent they are digitally mature. The assessment contains factors as

corporate strategy, leadership and corporate culture, organization and processes, employees and competences, technology, products and services and supply chain and networks. For this study the survey contained only the first four factors (corporate strategy, leadership and corporate culture, organization and processes, employees and competences) because the rest of the questions could only be answered by managers who are only in charge with digitalization issues of company. Since the survey is conducted to employees regardless their managerial position, only the factors that could be answered by regular employees were included in the study survey.

Techno stress was assessed by the scale of Tarafdar and his colleagues (2007). In the original scale, techno stress is examined in five sub-dimensions. In the aforementioned study, a total of 23 expressions are used, with 5 for techno-workload, 4 for techno-invasion, 5 for techno complexity, 5 for techno-insecurity, and 4 for techno-uncertainty. In the original study, the Cronbach alpha coefficients were; It is 0.89 for techno-workload dimension, 0.81 for techno-violation, 0.84 for techno-complexity, 0.84 for techno-insecurity, and 0.82 for techno-uncertainty. The scale was used in various studies in Turkish literature (Türen, Haluk ve Kalkın, 2015: 17; Ilgaz, Bülbül ve Çuhadar, 2016: 13; Çetin and Bülbül, 2017: 1242; Çetin, 2017: 25).

#### 4. FINDINGS

In order to obtain meaningful findings from the collected data, first of all, the reliability and validity of the measurements of the variables were confirmed. For this purpose, the scales, whose validity was tested before, were reduced to sub-factors with Exploratory Factor Analysis (EFA) and made ready for other analyses. Afterwards, hypotheses were tested with regression analysis and significant differences in results were noted with non-parametric tests.

As a result of the factor analysis for the items of the digitalization scale, which is the independent variable of the research model, the KMO value was finally found to be 0.930 after some iteration. Three items were taken out because they were having similar factor loadings under different factors. In the final factor analysis, the measured variable revealed two meaningful factors: Employee digitalization and organizational digitalization. When the factor analysis was forced to four factors because only four original factors were involved in the study survey; the factors were not found to contain meaningful items gathered under them. Whereas in the last factor analysis the two factors contained items which were found convenient to be categorized as employee and organizational digitalization. Since the result of the Bartlett Sphericity test for the data group was found to be  $p < .001$ , it is understood that there is a significant relationship between the items of the scale. Thus, it shows that this scale is suitable for factor analysis and that the measured feature is multidimensional in the universe from which the sample was selected ( $X^2=4661.327$ ;  $sd=136$ ). These factors explain 71% of the variable variance in total. Considering that the variance rates ranging from 40–60% are considered ideal in social sciences (Erdoğan, Bayram and Deniz, 2008: 121; Çokluk, Şekercioğlu and Büyüköztürk, 2010: 36), it can be said that the 71% variance rate obtained as a result of this research is quite satisfactory. It shows that the reliability of the items constituting both factors is quite high ( $\alpha_{\text{employee digitalization}}=0.943$ ;  $\alpha_{\text{organizational digitalization}}=0.931$ ). Explained variance by employee digitalization is 36.948% variance of the scale and by organizational digitalization, it is 32.479% variance of the scale. In total, they explain 69.427% of the variance.

The dependent variable, Techno stress, was found to have a KMO value of 0.901 as a result of EFA after a few iterations. ( $X^2=3375.793$ ;  $sd=136$  ve  $p < .001$ ). When questions with similar factor weights in different factors were removed and factor analysis was applied again. Although in the original version of the scale, the variable was considered to have five factors (Techno- workload, invasion, complexity, insecurity and uncertainty), it was seen that the variable was significantly divided into three sub factors namely techno-insecurity, invasion and development. Techno development was named as it is because it contained items from mostly likely uncertainty and insecurity that were related with development. Accordingly, these three factors explain 67.14% of the total variance of the variable ( $S^2_{\text{techno insecurity}}=27.09\%$ ;  $S^2_{\text{techno invasion}}=25.4\%$ ;  $S^2_{\text{techno development}}=14.66\%$ ). Reliability analyzes of the three factors were performed and the internal consistency coefficients of all factors were found sufficient to continue the analysis ( $\alpha_{\text{techno insecurity}}=0.909$ ;  $\alpha_{\text{techno invasion}}=0.864$   $\alpha_{\text{techno development}}=0.773$ ).

Since the research hypotheses consisted of assumptions for testing causal relationships, regression analysis was applied. Since the independent variable consisted of two sub factors, multiple regression analysis was conducted. It is necessary to perform firstly correlation analysis between variables first to examine the relationships between variables and their sub-factors. Before performing the correlation analysis, whether the variables showed normal distribution was examined with the Kolmogorov-Smirnov test. Since the significance values for each group were less than 0.05 according to this test, the  $H_0$  hypothesis was rejected (Sipahi, Yurtkoru, & Çinko, 2010: 56), and it was determined that the data were not normally distributed with 95%

confidence. For this reason, the correlation coefficient used in the said correlation analysis is Spearman's rho coefficient. Since the correlation coefficient “r” varies between (-) 1 and (+)1 in the correlation analysis, 0.4 and below are known as weak or unrelated (Kılıç, 2012: 191); Moderate correlations ranging from 0.4 to 0.7 or good correlations between 0.8 and 0.9 were examined.

In non-parametric correlation analysis, the level of correlation between dependent and independent variable is found to be  $r=0.355$ , which is known as a weak relationship. Among the sub factors of techno stress, the strongest correlation with digitalization and its subfactors comes forth for techno development. The correlation coefficient for the relationship between techno development and digitalization is  $r=0.449$ . As for relationship of techno development with the sub factors of digitalization, the correlation is found to be higher ( $t_{\text{techno development \& employee digitalization}}=0.458$ ; ( $t_{\text{techno development \& org. digitalization}}=0.409$ ). These correlations are at moderate level. Accordingly it can be said that techno stress is correlated with digitalization most particularly through techno development.

For the hypothesis testing, both dependent and independent variable were entirely involved in the regression analysis. Since the first hypothesis mainly assumes the effect of digitalization on techno stress, simple regression analysis was conducted. As it is seen in the table below, the hypothesis that the idea of digitalization increases techno stress level was tested with simple linear regression and it was found that the hypothesis was significantly supported ( $\beta= 0.356$ ;  $p<0.05$ ); (Model 1). Accordingly, the power of digitalization to explain techno stress is  $R^2=0.126$ . This means that; digitalization explains 13% variance of techno stress.

For the sub hypotheses that assume the effect of the independent variable on the subfactors of dependent variable, simple regression model was conducted. The results supported  $H_{2a}$  and  $H_{3a}$  which assumed the effect of digitalization on techno invasion ( $R^2=0.08$ ;  $\beta= 0.336$ ;  $p<0.05$ ). and techno insecurity ( $R^2=0.023$ ;  $\beta= 0.188$ ;  $p<0,05$ ). As for  $H_{1a}$  it can also be said that the hypothesis is almost supported because techno invasion included most of the items from techno workload that were indicated in the original scale. On the other the rest of the hypotheses could not be tested since those factors did not reveal from the factor analysis in this study.

Besides the proof of the main hypothesis, the table below demonstrates the results of the multiple regression analysis that was separately conducted for each of techno stress factor and the techno stress overall. The table demonstrates only the significant results. In the second model, when both factors of digitalization are regressed together, only the employee digitalization significantly is seen to affect techno stress. In other words only employee digitalization can take place in the regression equation model to explain techno stress [Techno stress=  $1.819 + (0.232 \times \text{employee digitalization})$ ]. This regression equation means that a unit change in the level of employee digitalization makes a 0.23 unit change in his/her perception of techno stress. The model explains only 13% of the variation in techno stress ( $R^2=0.13$ ,  $p = 0.000 < 0.05$ ).

When both employee and organizational digitalization factors regressed to explain the factors of techno stress, the only significant result is found for techno development. The model 3 demonstrates only the significant result in the multiple regression analysis. It is proved that only employee digitalization in multiple regression model could contribute to techno development among techno stress factors [Techno development=  $1.548 + (0.479 \times \text{employee digitalization})$ ]. The explanatory power of this model is  $R^2=0.21$ ; that is, the variable of employee digitalization can explain the 21% variance of techno development.

Table 3. Regression Analyses

<b>Dependent variable: Techno stress</b>				
	<b>Variables</b>	<b>Beta</b>	<b>t</b>	<b>p</b>
Model 1	Digitalization (overall)	0.356	6.559	0.000
$R=0.355$ ; $R^2=0.126$ ; $F=43.016$ ; $p=0.000$				
Model 2	Employee digitalization	0.232	2.253	0.025
$R=0.356$ ; $R^2=0.127$ ; $F=21.602$ ; $p=0.000$				
<b>Dependent variable: Techno Development</b>				
	<b>Variables</b>	<b>Beta</b>	<b>t</b>	<b>p</b>
Model 3	Employee digitalization	0.479	4.059	0.000
$R=0.459$ ; $R^2=0.211$ ; $F=39.653$ ; $p=0.000$				

After testing the hypotheses it was examined whether the variables differed among the groups formed with demographic information such as gender, age, seniority, education. Among the demographic groups, it was determined that there were only differences according to age ( $p_{age} = 0.003 < 0.05$ ) work tenure ( $p_{work\ tenure} = 0.016 < 0.05$ ) and sector ( $p_{sector} = 0.000 < 0.05$ ).

Table 4. Non Parametric Difference Test

	Age	N	Mean	p value	Chi square
Techno stress	20-29	159	153.35	0.003	11.887
	30-39	123	137.81		
	40-49	18	212.06		
	Work tenure	N	Mean	p value	Chi square
Techno development	Less than a year	27	165.31	0.016	10.283
	2-5 years	149	138.04		
	6-10 years	77	150.18		
	10 years +	47	182.01		

In the Kruskal Wallis analysis (see Table 4), which is used to test the significance of the difference between the means of more than two groups that do not show normal distribution, it is seen that the change of techno stress in terms of age demonstrates u-shaped distribution. It means that as techno stress level decreases until the mid-age and it shows an increase as the age does ( $\mu Rank_{20-29} = 153.3$ ,  $\mu Rank_{30-39} = 137.81$ ;  $\mu Rank_{40-49} = 212.06$ ).

In terms of techno development work tenure shows the similar tendency. While techno development perception decreases from first year ( $\mu Rank_{less\ than\ a\ year} = 165.31$ ) to tenure between 2-5 years ( $\mu Rank_{2-5\ years} = 138.04$ ); as work tenure increases ( $\mu Rank_{6-10\ years} = 150.18$ ;  $\mu Rank_{10+} = 182.01$ ) techno development level increase too.

Lastly in terms of sector, digitalization demonstrated significant differences. Accordingly the highest level of digitalization among the study sectors is significantly seen in food sector, while it is seen the least in informatics sector ( $\mu Rank_{food} = 188.6$ ;  $\mu Rank_{informatics} = 109.91$ ). Another significant difference in terms of sector is found for banking and health sectors. Health sector is found to perceive the techno insecurity the least ( $\mu Rank_{health} = 125.91$ ), while banking sector perceives it the highest ( $\mu Rank_{banking} = 213.5$ ).

### 5. CONCLUSION

This study is conducted to test the relationship between digitalization and techno stress. For the advanced analyses the data collected was examined to compare the factors that are mentioned in the previous studies in literature and the ones revealed in the current one. By the factor analysis, the sub hypotheses thus could be tested. Finally the variables were analyzed in terms of any significant difference among sample groups.

The first result to be discussed is about the factors that are gained during factor analyses. Likewise the factors for both variables are not found to be the same as in literature. Starting with digitalization, this variable is found to be divided into two meaningful factors named as organizational and employee digitalization. Whereas the scale, which has adopted from Fraunhofer Digital Transformation Assessment ([www.ipk.fraunhofer.de](http://www.ipk.fraunhofer.de)) consists of corporate strategy, leadership and corporate culture, organization and processes, employees and competences, technology, products and services, supply chain and networks factors. When examining this assessment, it is thought that the items were measuring the digitalization of a company in the sense of employees and organizational dynamics. The factors that revealed so, found to be convenient to be named as organizational and employee digitalization. According to Sebastian, Ross, Beath, Mocker, Moloney, Fonstad (2017: 197) the concept of digital transformation stems from the mixing of personal and corporate settings and captures the transformative impact of new digital technologies. It highlights the changes that have occurred at the individual, organizational, and social levels that are relevant to the prior scenario and are occurring under the impact of digital technology, which in reality encompasses much more than the ultimate outcome (Kokolek, Jakovic & Curlin, 2019: 46).

Researchers have conducted studies on the dimensions and consequences of techno stress at different times. These studies revealed that techno stress has five dimensions (Tarafdar et al., 2007:306): Techno- invasion, workload, insecurity, complexity and uncertainty. In this study the factors emerged as techno- invasion, insecurity and development. The first are just found as it was in previous studies but the techno development came up as new sub factor in the study. When its items were compared with other factors, it is seen that it had mostly the items from uncertainty and insecurity. It was named as development because the items were concerned with improvements in technology in organization either in the view of employees or organization.

Arnetz and Wiholm (1997: 35) had considered the physiological arousal and mental state observed in some employees when technological developments directly affect the work done. In regards to such finding, technological development can be accepted as a sub factor of techno stress.

The main hypothesis of the study was supported at the end of regression analysis. In work life digitalization affects employees in a negative way and causes them to perceive high techno stress. The introduction of new technologies at work has long been recognized as a source of worry, uncertainty, and new work environment risks (Schabracq, Marc and Cooper, 2000: 227). Increased use of technology limits workers' contact with human peers and social support, which may be harmful to their mental health (European Agency for Safety and Health at Work, 2019). Although technology benefits people and organizations in general, it can also have negative aspects, such as techno stress.

The sub hypothesis that is proved about the impact of employee digitalization on techno development indicates that employees are the ones who partake of the negative outputs of technological developments. The increasing area of influence of technological developments has made it a necessity for individuals to constantly update themselves in terms of technology (Çetin, 2017:23; Khan, Rehman and Rehman, 2013:9-13). This situation; requires individuals to work and spend effort in order to gain new competencies in a continuum. According to Tarafdar et al. (2011), there is a "blurring between work-related and personal contexts" (p. 310). Furthermore, Ayyagari et al. (2011) explains the implications as the end-user with high connectivity has task interruptions, such as irregular e-mails, and feels spent (p. 841). In a circumstance where the user is unable to complete the previous work and hence feels strained, or "information fatigue" (Ragu-Nathan et al. 2008: 421)

Digitalization is a job resource in two ways: on the one hand, it allows employees more flexibility in work scheduling and location, giving them more control over when and where they work; on the other hand, it reduces physical and emotional demands by automating repetitive, un motivating, and physically demanding work processes (Larjovuori, Bordi, Mäkinemi and Heikkilä-Tammi, 2016: 1141). The authors also proposed a new concept of "techno-work engagement" as a measure of organizational subjective well-being.

With reference to difference tests, it is supported that the relationship between age and techno stress is a U shaped one which means that as age increases from a particular time, the level of techno stress of employee increases too. A similar relationship is also seen between techno development and work tenure. Most studies report that age is a significant positive predictor of how employees perceive the overall level of techno-stressors (Fuglseth & Sørebo, 2014: 161; Tu, Wang & Shu, 2005: 923; Shu, Tu & Wang, 2011: 77). However, one study reported that the experience of techno-stressors decreases as age increases (Ragu-Nathan et al. 2008).

In terms of sector, the study revealed that the level of digitalization is mostly felt high in food sector. When literature is examined, it is feasible to assert that the topic of digitalization in the food sector has begun to be explored in depth during the last two years, with the common keyword "Factory of the Future" and "Food" being related. Furthermore, "Sustainability," "Robotics," and "Internet of Things" are three contemporary digitalization developments that describe the food industry. Accordingly the current research supported the facts of digitalization in food sector (Demartini et al., 2018). The reason that informatics sector perceived digitalization the least is that this sector already does digital work, that is why they may be desensitized to digitalization.

In many industries, technological advancements have an impact on corporate operations (Benamati, 2001). Many shareholders are enticed to spend more money in technology because of the efficient usage of software applications by major corporations throughout the world. According to a research by Embi (2007), commercial banks have seen fast technological developments in recent years with the introduction of new computer programs, which has resulted in changes in the nature of work among workers. In the current study, another significant result was seen in terms of techno insecurity. Techno insecurity was found to be the highest in banking sector. True, all banks rely entirely on modern computer applications, particularly in the processing and transmission of massive volumes of data (Rosen and Weil, 1995). Accordingly it is expected to perceive techno insecurity by bank employees.

For future research different variables may be included in the relationship of techno stress and digitalization. Techno stress has a negative impact on productivity, performance, job dedication, and well-being among those who are impacted (Taraftdar, Tu, & Ragu-Nathan, 2011: 119). Accordingly consequences of this relationship may be examined. On the other hand digitalization has a number of good consequences, including improved intra organizational collaboration, improved cross-departmental communication, and higher productivity and happiness in teamwork situations. So this relationship may be interrogated through a positive aspect to see how digitalization affects organization against techno stress.

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