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Original Research

Investigating User Resistance of Employees Working at Technology Companies in Istanbul towards Digital Transformation[1]

İlknur Mete
M.A. in Business Administration, Graduate School
Bahçeşehir University, Istanbul, Turkey
meteilknur@gmail.com
ORCID iD: https://orcid.org/0000-0003-3980-0198

Cafer Şafak Eyel
Dr., Graduate School
Bahçeşehir University, Istanbul, Turkey
Corresponding Author:
cafersafak.eyel@ou.bau.edu.tr
ORCID iD: https://orcid.org/0000-0002-2391-6316

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Abstract

Technology companies in a continuous transformation process within the scope of Industry 4.0 practices have followed rapidly changing and developing technological advances closely and have made permanent and successful digital transformation efforts. However, there might be met with resistance of employees sometimes during the digital transformation process. This study examines the user resistance of the employees working at technology companies in Istanbul towards digital transformation and determining user resistance factors. A survey questionnaire was prepared to gather the data. In this regard, The Scale of User Resistance towards Information Systems Implementation developed by Kim & Kankanhalli (2009) with 24 statements was used. The scale has seven dimensions: user resistance, perceived value, switching benefits, switching costs, colleague opinion, self-efficacy for change, and organizational support. The target population of the study consists of the employees working at the technology companies in Istanbul. One of the pioneer companies of the information technology sector was selected as the sample group, and 220 employees attended the research based on voluntariness. SPSS 22.0 program was used for the analysis of the data. According to the results, it was found that the participants have low-level user resistance and adapt to the digital transformation at high-level generally. Furthermore, as the result of hypothesis tests, the findings indicate an effect of perceived value and switching benefits, self-efficacy on user resistance, self-efficacy and organizational support on switching costs, and colleague opinion on perceived value and switching benefits, were reached. At the end of the research, the findings were interpreted via previous research findings. Some recommendations were made for both future studies and the sector on adaptation to the digital transformation.

Keywords: Digital Transformation, Industry 4.0, User Resistance, Openness to Change, Technology Company.

Introduction

Since the 1st Industrial Revolution, the primary purpose of all industrial revolutions has been to decrease costs and increase efficiency. During this process, new tools, new ways of production, and new technologies have been sought, and in this respect, all industrial revolutions emerged in different ways (Drucker, 1999). From the beginning of the 1st Industrial Revolution, the human factor has been the main variable in the efficiency equations. In this regard, the researchers have sought ways to increase employee efficiency (Katz, 1964). Besides the human factor, the emergence of new technologies has been an essential element in the emergence of industrial revolutions. Likewise, new technologies have shaped these industrial revolutions. For example, the last industrial revolution was named the 4th Industrial Revolution. Cyber-physical systems are the driving force compared to the 3rd Industrial Revolution, in which the autonomous systems were in the center (Bartodziej, 2015).

Digital transformation can be seen as a key for the companies to maintain their existence in today's conditions in which the organizations need information and communication technologies. The main focal point of many companies is to benefit from digital technologies to increase their profitability, efficiency, and effectiveness. In this regard, the role and effect of digital transformation have been experienced more day by day. Today, companies' how to be managed, how to create value, and how to become more efficient and sustainable are related to their adaptation into digital transformation. Furthermore, it can be claimed that it is not very easy to adapt to the innovative changes for all companies and sectors. Likewise, managing digitalization and transformation brings new challenges for companies. Most of the employees, especially those working in the technology and informatics sector, meet with the technology and technological changes within their working life. They use these technologies while working. Therefore, the employees' adaptation to the technology and technological changes is seen as very important for companies. In this respect, the purpose of this study is determined as examining user resistance of the employees working at a technology company in Istanbul towards digital transformation and determining the factors affecting the user resistance. In recent years, the digital transformation process has begun worldwide due to the quick and essential advances in information and communication technologies. Thus, many business models and methods used in companies have changed. And many employees have started to resist these changes within the scope of digital transformation. In the context of this study, they are measuring the perceptions and user resistance of employees working at technology companies operating in Istanbul, Turkey, towards innovative changes. The changes that happened due to digital transformation constitute the importance of this study because there are so few studies in the literature about measuring the perceptions of employees towards digital transformation (Joshi, 1991; Venkatesh, 2000; Kim & Kankanhalli, 2009).

Industry 4.0 and Digital Transformation in the Companies

The evolution of information and communication technologies in the last 30 years led to radical changes in daily and business life. Rapidly growing digitalization of the economy and society became a vital indicator, especially for the manufacturing industry. Industrial digitalization emerged via the Industry 4.0 has radically changed the future of the business models of manufacturer companies (Schwab, 2016).

Industry 4.0, firstly mentioned in Hannover Trade Fair on 1st April 2011 as "Industrie 4.0" in German language (Vogel-Heuser & Hess, 2016; Sung, 2018). A project including the cyber-

physical systems to be developed and put into practice until 2020 for Germany's not to lose its feature to be a production base (Kagermann, Lukas & Wahlster, 2011). The theoretical basis of the 4th Industrial Revolution depends on the article written by Kagermann, Lukas & Wahlster (2011). It formed the basis of the report published by ACATECH in 2013 (Stock & Seliger, 2016). After Germany, also some other countries started to prepare their programs towards Industry 4.0. In this respect, China aimed to become the leader in innovation, technology and manufacturing with the "Made in China 2025" plan. Moreover, the U.S. government determined its roadmap for Industry 4.0 with the "Advanced Manufacturing Program" and "Smart Manufacturing Leadership Coalition Program" in 2016. Furthermore, Japan introduced its human-oriented plan named "Society 5.0" (Ślusarczyk, 2018). It might be seen that different countries have various approaches towards the Industry 4.0 process. In this regard, there were made different definitions of the Industry 4.0 concept. Kagermann, Wahlster & Helbig (2013) described Industry 4.0 as the new value chain organization and management throughout the product life cycle. Rüßmann et al. (2015) identified Industry 4.0 as creating the digital value chains for the production environment to digitalize and automate and communicate the product, environment, and business partners. Zhou, Liu & Zhou (2015) defined Industry 4.0 as a complex and flexible system including many fields such as digital production technology, network communication technology, computer technology, automation technology, etc. Hermann, Pentek & Otto (2016) claimed that Industry 4.0 is a common term for the value chain organization concept and technologies. Zezulka, Marcon, Vesely and Sajdl (2016) described Industry 4.0 as the digitalization and adaptation of basic technologies, completion of the complex economic relations, and digitalization of the products and services. Lu (2017) identified Industry 4.0 as an integrated, adapted, optimized, service-oriented, and interoperable production process related to algorithms, big data, and high technologies.

Industry 4.0 represents production systems bringing a series of technologies adding value to all product life cycles in a new industrial phase. This new industrial phase includes smart approaches based on communication and information technologies in all activities in the value chain (Frank, Dalenogare & Ayala, 2019). Transition to Industry 4.0 in the companies refers to job definitions and tasks, job requirements and competencies, and production processes. This situation affects the abilities and competencies that the employees need (WEF, 2016). The 4th Industrial Revolution provides much more information technology infrastructure and services via smart networks, and it brings the industry with high technology together. With the transition to the 4th Industrial Revolution, machines could communicate wirelessly through the Internet and autonomous microcomputer technologies (Kagermann, Wahlster & Helbig, 2013). Moreover, Industry 4.0 has the features of producing personal products, instant communication and data exchange, human-machine interaction, etc. (Lu, 2017).

The previous three industrial revolutions were described as mechanization, electrification, and automation (Snudden, 2019). In contrast, Industry 4.0 involves a range of new digital industrial technologies to emerge (Rüβmann et al., 2015), production system to be applicable and sustainable (Carvalho, Chaim, Cazarini & Gerolamo, 2018), Internet of things to be added into the production environment (Kagermann, Wahlster & Helbig, 2013). Moreover, Industry 4.0 emerged due to the globalizing world's political, social, economic, and technological changes. Therefore, all types of information and communication technologies used in daily life are the driving force of Industry 4.0 (Lu, 2017).

For employees to protect their positions in the company, adaptation to the Industry 4.0

process is very important. In this respect, the employees should learn about the new processes towards Industry 4.0 required for the adaptation (Sung, 2018). The labor force that the new technologies need is not based on physical power but smart power. These technologies need for the labor force requiring skill-orientation and reasoning. Therefore, the value of the individuals who have engineering, creativity, and design has started to increase. Thus, today, there is a need for the labor force to use these new technologies and work with them (Brynjolfsson & McAfee, 2015).

With Industry 4.0, new technologies have been integrated with the industrial processes to make much reliable production in high-performance and decrease the energy consumption and labor costs. In this regard, digital innovations that emerged in the industry in the 21st century have led to Industry 4.0. Furthermore, digital transformation concepts to be used together (Schulthess, 2018). Therefore, it can be argued that these new technologies emerging with the Industry 4.0 are related to digitalization, which means the transformations that would occur with the adoption of the information and communication technologies producing, processing, and transferring the information by decision-making mechanisms composing society. Furthermore, digitalization depends on the use of telecommunication networks, computer technologies, and software programs which are the basis of information technologies (IT) (Katz, 2017).

Digital transformation is described by Fitzgerald, Kruschwitz, Bonnet & Welch (2013) as using technology to improve companies' performance radically. However, different actors, every transformation is fulfilled, are directed by different motivations, revealing different solutions and outcomes. In this regard, digital transformation could not be seen as a specific goal but can be seen as a journey. In this respect, digital transformation requires new technologies such as social media, mobile access, analytical or embedded devices, etc. Moreover, it involves corporate-wide digital transformation strategies focusing on the corporate opportunities and risks arising from digital technologies (Singh & Hess, 2015).

Furthermore, Elnaghi, AlShawi, Weerakkody & Aziz (2009) identified digital transformation as the transition process for the companies from using old methods to new ones when carrying out their activities and processes. Moreover, Matt, Hess & Benlian (2015) defined digital transformation as an important change in the companies' commercial activities, products, processes, and organizational structure benefiting from digital technologies. Also, Brynjolfsson & McAfee (2015) claimed that digital transformation or the second machine age is based on information, access, interaction, cooperation, and creating added value rather than physical and industry-based production.

According to the World Economic Forum (WEF, 2016), the companies, individuals, and governments that cannot use the information and digital activities in the digitalization process would have difficulty transforming new ideas and technologies into job opportunities. Thus, it can be claimed that digital transformation is a catalyzer speeding up the existing social and economic dynamics. In this regard, the companies that can comply with the digital transformation and could use it effectively can preserve and even develop their competitive positions in the market and strengthen interaction in all value production processes (Hausmann & Hidalgo, 2013).

Digital transformation has changed the business models of all sectors and companies. On the one hand, new technologies and changing consumer behaviors compel companies to change their products and services radically. On the other hand, creating a huge value in terms of the

companies through developing internal processes increases transparency, providing all tools required to make many quick and effective decisions in all stages of the organization. Therefore, digital transformation is more effective than all other transformations requiring new business and operation models, organization structures, and competencies (Nettesheim, Faeste, Khanna, Waltermann & Ullrich, 2016). Furthermore, Channon & Caldart (2015) mentioned seven main components for the companies to adapt into digital transformation according to McKinsey's 7S model: strategy, structure, system, style, staff, and skills and shared values.

New technologies such as robots, machine learning, the Internet of things, cloud computing, artificial intelligence, etc. have made considerable changes in the business world. Lots of companies in different sizes might use these technologies to decrease costs. Industry 4.0 has created unlimited opportunities for companies with its numerous technology alternatives. In this regard, the companies should consider which technologies can meet their needs, which technologies they should invest in, and how they distribute their sources. Moreover, companies' corporate strategies, capabilities, business models, and organizational structures should be compatible with these decisions (Hanley, Daecher, Cotteleer & Sniderman, 2018).

The digital world changes so fast; therefore, companies should become flexible in organizational structure, technology, and personnel to comply with digitalization. In this regard, it is suggested to quickly establish agile organizations that can adapt to the new technologies. Moreover, companies should establish an organizational structure supporting independence and encouraging risk-taking for successful digitalization strategies. Therefore, it can be claimed that digital transformation requires taking the risk. Furthermore, companies should increase interdepartmental cooperation and decrease corporate resistance that could appear against the digital transformation (Gobble, 2018).

User Resistance to Change

Resistance to change is the structure staying against the power that emerged to change the existing situation (Zaltman & Duncan, 1977). Moreover, resistance to change can be seen as an attitude and can be described as the employees' not accepting the change desired by the organization's management (Dent & Goldberg, 1999). Furthermore, Chawla & Kelloway (2004) defined resistance to change as all behaviors and attitudes preventing the organization from reaching the change's goals. Resistance to change is the action made by individuals and groups when they perceive a change as a threat to themselves. Here, the keywords are perception and threat. It is not required that the threat is significant or natural for the resistance to occur. Thus, the resistance can be active or passive, open or secret, individual or organizational, aggressive or timid (Kanar, 2006).

It can be claimed that one of the most important aspects of the change is the resistance to change. In the companies, the employees can give the reaction by rejecting the changes directly or protesting them. In this respect, the companies should minimize the employees' resistance since the change is inevitable. The managers of the companies should realize and understand these problems and the reasons for the resistance and help the employees adopt these changes smoothly (Armenakis, Harris & Mossholder, 1993). Even if the change meets with the resistance mostly, it is possible to overcome the resistance situation. In this regard, the managers should make efforts for the employees to adapt to these changes. Because the managers' taking the lead for the change decreases the possibility of the employees resisting. Moreover, the education and training programs can help employees accept these changes trustfully (Dent &

Goldberg, 1999).

There are only a few studies on measuring the resistance to change or the user resistance of employees towards the digital transformation in the literature. In Kim & Kankanhalli (2009) study, the factors influencing the user resistance in the information systems implementations were investigated. According to the research results, perceived value, switching costs, and organizational support significantly affect user resistance. However, self-efficacy for change and colleague opinion does not have a significant effect on the user resistance. Furthermore, it was found that self-efficacy for change and colleague opinion significantly affect the switching costs. However, organizational support does not have a significant effect on switching costs. Moreover, it was determined that switching costs significantly affect the perceived value, and colleague opinion significantly affects the switching benefits.

Materials and Method

In this section, information about the universe and sample, measurement instruments, research model and hypothesis, and data analysis were expressed.

Universe and Sample

The universe of the study consisted of the technology companies' employees in Istanbul, Turkey. One of the leading companies in the informatics sector was selected as the sample group, and 220 employees attended the research survey based on voluntariness. In this regard, a convenience sampling technique was used to reach to the participants. The survey was conducted between 25th September, 2019 and 11th November 2019.

According to the gender of the participants, 139 of them are male, and 81 are female. In terms of the age group, 33 are between 18-25, 93 are between 26-34, 77 are between 35-44, and 17 are between 45 and above. For the education status, 140 have undergraduate, and 80 have a graduate degree. According to the marital status, 113 are single, and 107 are married. In terms of the total work experience, 18 have less than 1-year work experience, 28 have between 1-3 years, 20 have between 3-5 years, 48 have between 5-10 years, and 106 have more than 10-years work experience. In terms of the working duration in the same company, 52 work less than 1-year, 54 work between 1-3 years, 28 work between 3-5 years, 59 work between 5-10 years, and 27 work more than 10 years for the same company. For the position, 95 work as personnel, 81 work as mid-manager, 44 work as a manager, etc.

Measurement Instruments and Data Analysis

A quantitative research method was used in this study, and a survey technique was used as a quantitative data gathering method to collect the primary data. The prepared survey questionnaire was conducted on the employees of a technology company operating in Istanbul. The survey questionnaire consists of two parts. The first part is about determining the demographical features of the participants, and there are seven questions in this part. In the second part, The Scale of User Resistance towards Information Systems Implementation developed by Kim & Kankanhalli (2009) with 24 statements was used to measure the participants' user resistance towards the digital transformation and determine the factors influencing the user resistance. The scale has seven dimensions as user resistance (UR), perceived value (PV), switching benefits (SB), switching costs (SC), colleague opinion (CO), self-efficacy for change (SE), and organizational support (OS). PV means the perceived net

benefits of the innovative changes of the digital transformation. SC refers to the perceived disutility that an individual would incur in switching from old technology to a new one. SB means the perceived utility that an individual would enjoy switching from old technology to a new one. SE refers to the individuals' confidence in their ability to adapt to the changes. OS means the perceived facilitation provided by the organization to make individuals' adaptation to the changes easier. CO refers to the perception of the colleagues who are in favor of the changes. The statements of UR and SC are negative. Thus these statements transformed into positive during the analysis process.

SPSS-22.0 program was used to analyze the gathered data via the survey questionnaire. Below, the factor analysis and reliability analysis results for the scale were presented in Table 1. As the result of the factor analysis for the scale, there six factors were determined. Five factors and their statements are directly compatible with the original scale. However, two factors are the perceived value and switching benefits combined under one factor named Switching Benefits & Perceived Value (SB&PV). According to Table 1, the result of KMO measure of sampling adequacy (.822) indicates that the number of the sample group is adequate.

Furthermore, the scale is suitable to conduct the factor analysis according to Bartlett's Test of Sphericity (Chi-Square: 3053.975; df: 276; Sig.: .000). Moreover, the explained variance rates of the factors can be seen in Table 1. The total explained variance is adequate and high with %70.28. Also, the results of the reliability analysis were presented in Table 1. According to the reliability analysis results, SB&PV has a reliability of .907, UR has a reliability of .854, OS has a reliability of .924, SE has a reliability of .822, CO has a reliability of .828, and SC has a reliability of .665. Lastly, the reliability of the scale is .867. Therefore, according to the reliability results, it can be claimed that the reliability level of both the scale and factors is adequate and high.

Table 1
Factor and Reliability Analysis Results for the Scale

Code	SB&PV	UR	OS	SE	CO	SC	Reliability	Scale
SB2	.866						.907	.867
SB3	.865							
PV3	.807							
SB4	.796							
PV2	.758							
SB1	.742							
PV1	.613							
UR3rs		.837					.854	
UR2rs		.791						
UR1rs		.769						
UR4rs		.759						
OS3			.932				.924	
OS2			.896					
OS1			.868					
SE3				.856			.822	
SE2				.840				

Code	SB&PV	UR	OS	SE	CO	SC	Reliability	Scale
SE1				.650				
CO1					.895		.828	
CO2					.881			
CO3					.688			
SC2rs						.811	.665	
SC1rs						.719		
SC4rs						.640		
SC3rs						.585		
Explained Variance	19.48%	11.63%	11.35%	9.60%	9.60%	8.62%	Total %70.281	
KMO: .822; Chi-Square: 3053.975; df: 276; Sig.: .000								

In Table 2, the descriptive values of the factors that appeared after the factor and reliability analyses can be seen. According to the table, the factor that has the highest mean is UR with $\bar{x}$=4.3966. Thus, it can be claimed that the employees are highly compatible with the digital transformation and do not resist the changes brought by the digital transformation so much.

Table 2
Descriptive Values of Factors after Factor and Reliability Analyses

Factors	N	Min.	Max.	Mean	SD
User Resistance	220	1.00	5.00	4.3966	.61687
Switching Benefits & Perceived Value	220	1.00	5.00	4.2565	.58383
Switching Costs	220	1.00	5.00	3.2500	.68953
Colleague Opinion	220	1.00	5.00	3.5848	.74459
Self-Efficacy for Change	220	1.00	5.00	3.9833	.67890
Organizational Support	220	1.00	5.00	3.7106	.83468

Research Model and Hypothesis

The research model formed after the factor and reliability analyses made on the research scale can be seen in Figure 1. According to the model, these research hypotheses were developed:

H1: Switching Benefits & Perceived Value has a significant effect on User Resistance.
H2: Switching Costs have a significant effect on User Resistance.
H3: Switching Costs has a significant effect on Switching Benefits & Perceived Value.
H4: Self-Efficacy for Change has a significant effect on User Resistance.
H5: Self-Efficacy for Change has a significant effect on Switching Costs.
H6: Organizational Support has a significant effect on User Resistance.
H7: Organizational Support has a significant effect on Switching Costs.
H8: Colleague Opinion has a significant effect on User Resistance.
H9: Colleague Opinion has a significant effect on Switching Costs.
H10: Colleague Opinion has a significant effect on Switching Benefits & Perceived Value.

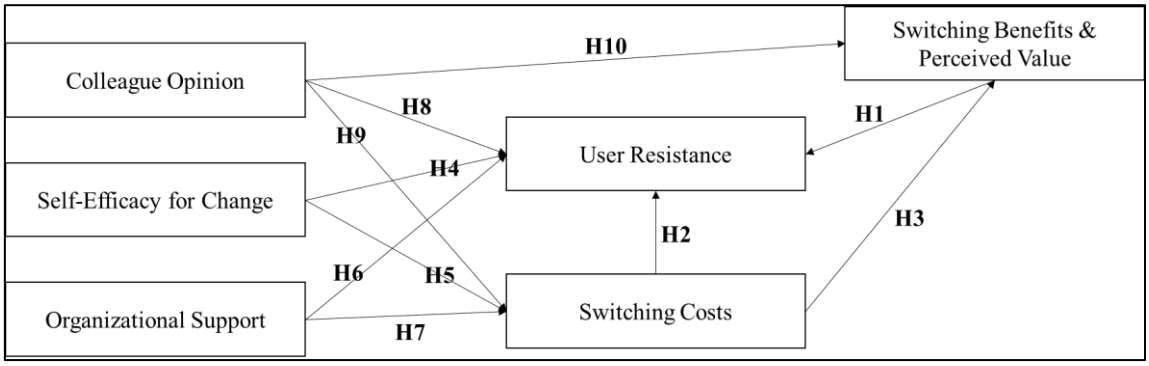

Figure 1: Research Model

Findings

In this section, the results of the multiple regression analyses for the research hypotheses were presented. In Table 3, the regression analysis results to find whether or not there is an effect of SB&PV, SC, SE, and CO on UR. According to the p-value of the model (.000) and the F-value (14.057), the model was found as significant. As the result of the regression analysis, SB&PV (β=.313) and SE (β=.236) have significant effects on UR, and these two factors explain %23.00 of UR. However, SC, OS, and CO do not have a significant effect on UR. Therefore, "H1: Switching Benefits & Perceived Value has a significant effect on User Resistance." and "H4: Self-Efficacy for Change has a significant effect on User Resistance." were accepted. However, "H2: Switching Costs has a significant effect on User Resistance.", "H6: Organizational Support has a significant effect on User Resistance." and "H8: Colleague Opinion has a significant effect on User Resistance." were rejected.

Table 3
Regression Analysis Results for User Resistance

Dependent Variable: User Resistance	Beta	t-value	p-value	Adj. R2	F-value	Model p-value
Constant		5.562	.000	23.00%	14.057	.000
Switching Benefits & Perceived Value	.313	4.819	.000			
Switching Costs	.111	1.754	.081			
Self-Efficacy for Change	.236	3.455	.001			
Organizational Support	-.055	-.829	.408			
Colleague Opinion	.031	.470	.639			

In Table 4, the result of the regression analysis to find whether or not there is an effect of SE, OS and CO on SC. According to the p-value of the model (.000) and the F-value (9.953), the model was found as significant. As the result of the regression analysis, SE (β=.290) and OS (β=.142) significantly affect SC, and these two factors explain %10.90 of SC. However, CO does not have a significant effect on SC. Therefore, "H5: Self-Efficacy for Change has a significant effect on Switching Costs." and "H7: Organizational Support has a significant effect on Switching Costs." were accepted. However, "H9: Colleague Opinion has a significant effect on Switching Costs." was rejected.

Table 4
Regression Analysis Results for Switching Costs

Dependent Variable: Switching Costs	Beta	t-value	p-value	Adj. R2	F-value	Model p-value
Constant		5.028	.000	10.90%	9.953	.000
Self-Efficacy for Change	.290	4.406	.000			
Organizational Support	.142	2.017	.045			
Colleague Opinion	.009	.129	.898			

Table 5 shows the result of the regression analysis to find whether or not there is an effect of SC and CO on SB&PV. According to the p-value of the model (.017) and the F-value (4.151), the model was found as significant. As the result of the regression analysis, only CO (β=.136) significantly affects SB&PV, which explains the %2.80 of SB&PV. However, SC does not have a significant effect on SB&PV. Therefore, "H10: Colleague Opinion has a significant effect on Switching Benefits & Perceived Value." was accepted. However, "H3: Switching Costs has a significant effect on Switching Benefits & Perceived Value." was rejected.

Table 5
Regression Analysis Results for Switching Benefits & Perceived Value

Dependent Variable: Switching Benefits & Perceived Value	Beta	t-value	p-value	Adj. R2	F-value	Model p-value
Constant		14.243	.000	2.80%	4.151	.017
Switching Costs	.118	1.759	.080			
Colleague Opinion	.136	2.025	.044			

Discussion

Companies desiring to respond to the changes and transformations effectively and reach their pre-determined goals cannot develop and grow via traditional methods and minor improvements. Thus these companies require to transform. Transformation means executing the radical changes in the strategies, business model, organizational structure, people, and processes. However, the human being resists imposing changes by its nature. In this regard, it aimed to measure the user resistance of the employees who work at a technology company towards the digital transformation and determine the factors that affect user resistance, switching costs, and switching benefits & perceived value within the scope of this study.

Multiple regression analyses were conducted to test the research hypotheses. All three models in which UR, SC, and SB&PA are dependent variables were significant. As the result of the multiple regression analysis conducted to find whether or not there is an effect of SB&PV, SC, SE, OS, and CO on UR, it was found that SB&PV and SE have significant effects on UR, but SC, OS, and CO do not have a significant effect on UR. According to these results, the perceptions of the employees working at the technology companies about the innovative changes made within the scope of digital transformation to bring benefits, increase their performances and efficiencies, and their easy adaptation to these changes influence their perceptions to resist changes negatively. However, the change would bring the organization's support for the employees on the innovative changes, and the colleagues' opinions about the changes do not influence the employees' perceptions of the resistance to change. In the study

made by Kim & Kankanhalli (2009), it was found that PV, SC, and OS have significant effects on UR, and SE and CO do not significantly affect UR. When comparing the findings of the two studies, it was determined that only the PV factor is the common predictor of UR in both studies. Moreover, the study's finding is parallel with the findings of the study made by Venkatesh (2000) about the effect of self-efficacy on the ease of use which can be evaluated as the reverse of user resistance. Furthermore, Joshi (1991) and Samuelson & Zeckhauser (1988) indicated that the perceived value is the predictor of the user resistance, and it is also parallel with the findings of this study.

As the result of multiple regression analyses conducted to find whether or not there is an effect of SE, OS and CO on SC, it was found that SE and OS have significant effects on SC, but CO does not have a significant effect on SC. According to these results, the employees can easily adapt to the innovative changes made in the technology companies within the scope of digital transformation. The organization's support on adapting to the changes influences the employees' perceptions about the costs that the employees have changed would bring negatively. However, the colleagues' opinions about the changes do not influence the employees' perceptions of the costs of the change. In the study made by Kim & Kankanhalli (2009), it was found that SE and CO have significant effects on SC, and OS does not significantly affect SC. When comparing the findings of the two studies, it was determined that only SE factor is the common predictor of SC in both of the studies.

As the result of multiple regression analyses conducted to find whether or not there is an effect of SC and CO on SB&PV, it was found that only CO has a significant effect on SB&PV, but SC does not have a significant effect on SB&PV. According to these results, the colleagues' opinions about the innovative changes made in the technology companies within the scope of digital transformation influence the benefits and advantages that the employees perceive about the innovative changes positively. However, the employees' perceptions about the costs of the changes do not influence the benefits and advantages of changes. In the study made by Kim & Kankanhalli (2009), it was found that SC has a significant effect on PV, and CO has a significant effect on SB. When comparing the findings of the two studies, it was determined that only CO factor is the common predictor of SB in both of the studies.

As the result of multiple regression analyses, it was found that there are similarities between the findings of this research and the study of Kim & Kankanhalli (2009). However, there are also some differences between the findings of the two studies. It can be claimed that the reasons for these differences could be a 10-year time difference between the two studies, the cultural differences of countries where these two studies were conducted, and the differences of sample groups' structures.

Conclusion

In conclusion, it can be claimed that the sample group has low-level user resistance to the innovative changes within the scope of digital transformation. Switching benefits & perceived value and self-efficacy for the change are the predictors of the user resistance; self-efficacy for the change and organizational support are the predictors of the switching costs, and colleague opinion is the predictor of the switching benefits & perceived value.

This research has some limitations. First, the study was limited to the Industry 4.0, digital transformation, and resistance to change in terms of the topic. The scope of the study was limited with the employees working at the technology companies which have R&D department. Because few technology companies are operating in other cities, Istanbul, which has many

technology companies, was selected as the research universe.

Recommendation

There can be made some recommendations for further studies. For example, similar studies can be made in some sectors such as health, education, and industry in which technology is highly used. Moreover, similar studies can be conducted in different countries to determine the differences in the employees' perceptions towards the innovative changes within the scope of digital transformation and compare these perceptions.

In terms of the managerial implications, it can be claimed that digital transformation is inevitable in all sectors; thus, all companies should take the required measures to adapt to the digital transformation in the globalizing world. Furthermore, technology companies should organize on-the-job training and corporate training to make their employees adapt to these changes and decrease the resistance to change to the minimum level. Moreover, the technology companies should emphasize the importance of the digital transformation in employment interviewing and select suitable candidates to employ who are eager and open to the change for the digital transformation.

Endnote

1. This article was derived from the master's study of "Digital Transformation and Resistance to Change in Technology Companies" prepared by İlknur METE under supervision of Dr.Cafer Şafak EYEL at Bahçeşehir University Graduate School of Social Sciences, and was presented as a verbal paper in 13th Istanbul Informatics Congress organized by Turkish Informatics Association at Bahçeşehir University on 5th of December, 2019.

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