Bilgiçli, İ. (2021). Evaluatıon of Manager Vıews Concernıng the Effect of Dıgıtal Transformatıon in Hospıtalıty Establıshments: Sakarya Example, *International Journal of Eurasia Social Sciences (IJOESS)*, 12(46), 900-921.

DOI: http://dx.doi.org/10.35826/ijoess.3016

ISSN: 2146-1961 ***ArticleType:*** *Research Article*

EVALUATION OF MANAGER VIEWS CONCERNING THE EFFECT OF DIGITAL TRANSFORMATION IN HOSPITALITY ESTABLISHMENTS: SAKARYA EXAMPLE

İsmail BİLGİÇLİ

Assistant Professor Dr, Sakarya Uygulamalı Bilimler Üniversitesi, Sakarya, Türkiye, bilgicli@subu.edu.tr

ORCID:0000-0003-1697-032X

Gönderim tarihi: 07.08.2021 *Kabul tarihi: 16.11.2021* *Yayım tarihi: 15.12.2021*

ABSTRACT

In this study, based on the evaluations of the managers of hospitality establishments in Sakarya, the aim was to determine which digital transformation activities are implemented in their establishments and to investigate personal views of the managers on the effect of digital applications on productivity. The study was conducted face to face between 1 March 2021 and 1 June 2021. The qualitative research method was used in the study. In this context, questionnaire and interview questions were generated in order to determine the demographic information of the participants, their personal evaluations on digital applications, and the digital applications used in the establishments. For the study sample; face-to-face interviews were conducted with on managers from the hospitality establishments at the centre and districts of Sakarya. In these interviews, managers stated that digital transformation is an important practice and that it contributed to personnel performance and consequently to the efficiency of production of service. Managers stated that they follow the digital applications of competing establishments very closely. Managers stated that the personnel may have a lack of training regarding the use of digital applications in their establishments and there may be a security vulnerability in terms of data protection against cyber-attacks, as well as high costs. Digital technology will accelerate the hospitality establishments operating in Sakarya. The implementation of digitalization will benefit the development of establishments and the development of their economies. Establishments that follow digital developments, have a vision of innovation in terms of science and technology and transform the service production into a way that will adapt to innovations, will be able to continue their existence. It can be said that the use of rapidly developing information and communication technologies in the tourism industry will be effective in increasing the quality of service production and personnel performance.

Keywords: Digitalization, digital tourism, efficiency

KONAKLAMA İŞLETMELERİNDE DİJİTAL DÖNÜŞÜMÜN VERİMLİLİĞE ETKİSİ KONUSUNDA YÖNETİCİ GÖRÜŞLERİNİN DEĞERLENDİRİLMESİ; SAKARYA ÖRNEĞİ

ÖZ

Bu çalışmada, Sakarya'daki konaklama işletmeleri yöneticilerinin değerlendirmelerine dayalı olarak, işletmelerinde hangi dijital dönüşüm faaliyetlerinin yürütüldüğünü belirlemek ve yöneticilerin dijital uygulamaların verimliliğe etkisine ilişkin kişisel görüşlerini araştırmak amaçlanmıştır. Araştırma 1 Mart 2021 ile 1 Haziran 2021 tarihleri arasında yüz yüze gerçekleştirilmiştir. Araştırmada nitel araştırma yöntemi kullanılmıştır. Bu kapsamda katılımcıların demografik bilgilerini, dijital uygulamalara ilişkin kişisel değerlendirmelerini ve işletmelerde kullanılan dijital uygulamaları belirlemek amacıyla anket ve görüşme soruları oluşturulmuştur. Çalışma örneği için; Sakarya merkez ve ilçelerindeki konaklama işletmelerinin yöneticileri ile yüz yüze görüşmeler yapılmıştır. Bu görüşmelerde yöneticiler, dijital dönüşümün önemli bir uygulama olduğunu, personel performansına ve dolayısıyla hizmet üretiminin verimliliğine katkı sağladığını belirtmişlerdir. Yöneticiler, rakip kuruluşların dijital uygulamalarını çok yakından takip ettiklerini belirtmişlerdir. Yöneticiler, personelin işletmelerinde dijital uygulamaların kullanımına ilişkin eğitim eksikliğinin olabileceğini, siber saldırılara karşı veri koruması açısından güvenlik zafiyeti olabileceği gibi yüksek maliyetlerin de olabileceğini ifade etmişlerdir. Dijital teknolojinin kullanılması Sakarya'da faaliyet gösteren konaklama işletmelerini üretimde hızlandırarak, gelişmelerine ve ekonomilerinin olumlu etkilenmesine fayda sağlayacaktır. Dijital gelişmeleri takip eden, bilim ve teknoloji açısından yenilikçi bir vizyona sahip olan ve hizmet üretimini yeniliklere uyum sağlayacak şekilde dönüştüren kuruluşlar varlıklarını sürdürebileceklerdir. Hızla gelişen bilgi ve iletişim teknolojilerinin turizm sektöründe kullanılmasının hizmet üretim kalitesinin ve personel performansının artırılmasında etkili olacağı söylenebilir.

Anahtar Kelimeler: Dijitalleşme, dijital turizm, verimlilik

INTRODUCTION

Nowadays, digital technology is used in all areas of the industry as well as in service production establishments. Due to the developments in technology, all industries have felt the need to update and adapt their practices. These updates have led to the formation of new lifestyle habits. In tough competitive conditions, it is only possible for establishments to maintain their position or to get ahead by realizing digital transformation. Tourism establishments have also started to follow Industry 4.0 and implement it mandatorily. With globalization, the acceleration of change and changing customer demands and needs have motivated establishments to implement technological developments. As a result of the intensive use of information in the tourism industry, the use of digital technologies has become inevitable. In line with the changes occurring in all industries and the world of technology today, Industry 4.0 has become important for global businesses to make profit and to maintain their existence in commercial life, within in an intensely competitive environment. İt is necessary to understand the Industry 4.0 process well, adopt it and use it in the business process.

When the world is rapidly moving towards a digital future, everything we see around us is rapidly changing and developing toward the path to digitalization. Changing digital trends and customer demands cause changes in technology to spread to all industries. Digitalization is a process carried out by establishments and institutions to increase their income, grow and increase business value by taking advantage of the environment and opportunities created by digital technologies (Konstantinou, 2016). The use of digital technologies is the most important interaction factor in the human-oriented tourism industry. Service quality in tourism is related to the appropriate and correct use of information technologies as the most important practice of the industry. The use of digital technologies can increase the performance of tourism enterprises. With digital technologies, web-based applications in tourism (social media, internet, etc.) affect the preferences of customers. In addition, it is possible that the use of developments within the scope of Industry 4.0 will have positive effects on the profitability of tourism enterprises. It is the result of the developments in technology that tourists share the historical and natural beauties in the destinations they went, their experiences during their vacation, and various activities they participated in via videos and photos, and make positive or negative comments on social media platforms, and that these are followed by potential tourists and influence their choices.

The aim of the study was to find out what technological applications the tourism establishments in Sakarya have experienced in their organizations, what changes have occurred in their strategies and to determine how much importance they attach to technological developments and the effects of technological applications on productivity. In addition, the aim was also to determine the perspectives of the managers participating in this study and to determine which applications their establishments use in digital transformation. In this study, based on the participants' opinions, it is foreseen that a consensus can be reached on which technological applications will be more useful in tourism establishments. In line with the aims of the study; along with a literature review covering digital transformation practices, the opinions of middle and senior managers of establishments operating in the field of tourism in all districts of Sakarya especially the districts such as Sapanca, Karasu, Adapazarı, Akyazı and Erenler were taken the reaction of the industry to technological

changes was determined, the effect of practicing digital technology on productivity and the positive or negative situations it has caused were evaluated. In the study, it is aimed to get the opinions of the managers about the use of digital technology and the effects on productivity of the tourism enterprises in Sakarya. It is predicted that the results of the study will make positive contributions to tourism businesses and managers in Sakarya. It is thought that the study will guide the tourism stakeholders of the Sakarya destination within the scope of creating medium and long-term management strategies.

CONCEPTUAL FRAMEWORK

Industry 4.0

Drath and Horch (2014) state that three industrial revolutions took place until Industry 4.0; state that Industry 1.0, which began in England, was effective until the mid-19th century, and Industry 2.0, as a technological revolution, covers the period up to the mid-20th century. Pamuk and Soysal (2018) state that Industry 3.0 is a technological entity that was built up starting from the 1970s by the relief of the wounds of the Second World War and elimination of the problems. Today, all industries are included in the fourth industrial revolution triggered by the development of Information and Communication Technologies (ICT). Industry 4.0 can be referred to as the intelligent automation of technology-based and cyber-physical systems (Topsakal et al. 2018). The concept of encouraging the traditional industry towards computerization and equipping it with high technology, which brings together information technologies and industry activities that will allow the industry to gain a new dimension, is called industry 4.0. Industry 4.0 is a three-legged organization that aims to bring together all vital mechanisms with information technologies. These are “internet of things, internet of services and cyber-physical systems” (Kürşat & Sayın, 2019:13-14).

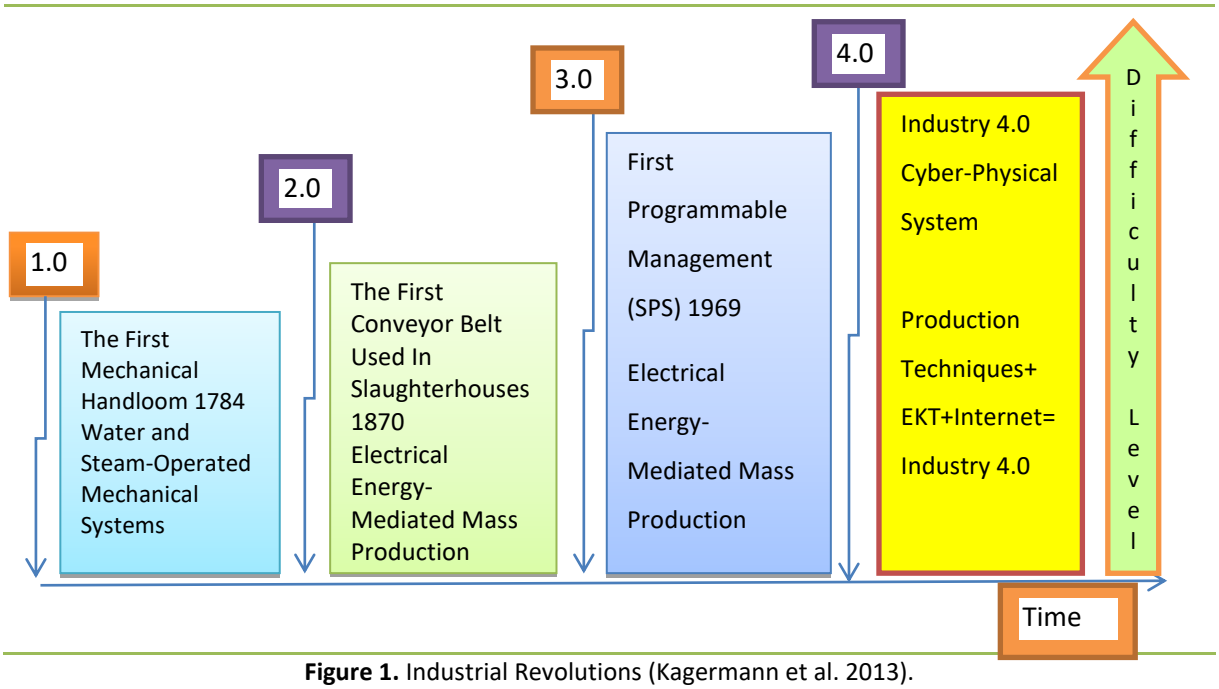


Figure 1. Industrial Revolutions (Kagermann et al. 2013).

Fleischman et al. (2020) state that Industry 4.0 means the digitalization of industry value-chains with intelligent combinations of hardware, software, data, socio-technical systems including people. Industry 4.0 includes people, physical devices and hardware software systems as a value-chain. According to Gider (2020), all developments in information technology play a large or small role in the development process of the internet. Thanks to many innovations from the past to the present, the internet has continued to develop and change. The periods called Web 1.0, 2.0, 3.0 and 4.0 showed great or small developments when they were implemented. In the light of the evolution process of the internet, which is divided into four main periods from the past to the present, and the developments along the stages of this process, predictions can also be made about the future of the internet environment. The changes that occurred in the development periods of the internet, internet producers and internet users, which have their own characteristics, are shown in Figure 1 below.

In a rapidly digitalizing world, it can be seen that screens take up more time in daily life. Data is generated continuously at different sources. Via the presentation of the produced information on different platforms, a fierce competition in order to attract the attention of consumers is established (Arıkan et al. 2021). Industry 4.0, also referred to as digital transformation, dominates the current century regardless of the industry with its innovative revolutions such as the internet of things, virtual reality applications, use of artificial intelligence, smart sensors, nanotechnology, augmented reality, 3D, smart hotels/robots, wearable technology, and quantum computing (Atar, 2020). Industry 4.0 is very flexible and durable in terms of quality standards in engineering, planning, production, operational and logistics processes as well as the physical processes of computer-driven systems. Industry 4.0 can also be defined as the creation of dynamic, simultaneously optimized, self-executing value-chains that can be applied to various metrics such as cost, availability and resource consumption (Yavuz, 2020).

Davutoğlu et al. (2017), Özkan et al. (2018), Serinikli, (2018), Atar, (2020) stated that the internet-based applications, the use of computers, the developments in the field of communication, and the speed of transportation that emerged with the development of technologies became stronger with the third industrial revolution. The rapid progress of technology after the third industrial revolution has led to today's digital transformation, the digital age, industry 4.0, that is, the fourth industrial revolution. Soylu (2018) stated that the developments in the field of informatics and communication in the early 21st century, the widespread use of the internet, and the advances in the field of programming contributed to the development of smart systems. Acatech (2013) states that Industry 4.0 systems are very flexible and durable in terms of quality standards as well as their physical processes. According to Reino et al. (2020), as an inevitable process that takes place all over the world, digital transformation is used in various fields of human activity which lead people to new developments and develop their knowledge, skills and competencies.

Industry 4.0 can also be referred to as cyber-physical systems which are defined as smart electronic systems with internet connection. The features of Industry 4.0, which symbolizes development and innovation, can be listed as the rapid launch of products and services, working in coordination, putting emphasis on on-site

management, being customer-oriented, creation of virtual environments, efficiency, and profitability. According to Öztürk et al. (2019), almost all industries are experiencing serious changes due to rapidly developing technology. Particularly, very rapid technological developments in the informatics industry also manifest themselves in manufacturing. Rapidly developing digital transformation practices all over the world are now used in production lines. As the main components of Industry 4.0, autonomous robots, IoT (İnternet of things), big data, system integration, cyber security and augmented reality (AR) applications are being implemented as advanced production techniques with the help of digital transformation and the implementation of advanced production techniques in manufacturing companies. Digitalization refers to using digital technology, and possibly digitized information, to create and collect value in new ways (Mary Anne, 2018). The term digitalization is often put to use differently, and is sometimes even used as a synonym for digitization or digital transformation (Berlak et al. 2020). Digitalization is the use of raw and unused materials related to intangible heritage in digital media by the stakeholders to create a public resource (Alivizatou, 2021).

Digital Tourism

The concept of digital tourism involves the practices that permeate and are used in many of the online activities that people do today through trip planning (Benyon et al. 2014). Digital tourism focuses on a wide range of destinations and elements such as museums, rallies, countryside, zoos and amusement parks (Durrant et al. 2011). Designers and researchers use a range of different tools and solutions to accommodate tourists, including interactive maps, tourism assistants, point-of-interest identification, and souvenir production (De Carolis et al. 2009; Schering et al. 2009; Durrant et al. 2011). These tools and approaches are design techniques in the field of digital tourism. Considering the characteristics of tourism as an industry, it can be seen that it is affected by technological and digital transformation like other industries. The tourism industry is becoming increasingly dependent on web-based technologies for regional competitiveness, largely due to consumer adoption of technology.

The digitalization of tourism is also very important in terms of effective use of already scarce resources and securing the future (Erkmen & Güler, 2020). Digital tourism is the use of digital technologies to enhance the tourist experience. It is also the blending of the real world with digital content to enhance the tourist experience (Adeola & Evans, 2019). Mobile phones and the internet have been driving the digital travel revolution and transforming the tourism industry in many developed countries in recent years (Law et al. 2018; Reino et al. 2013; Wang et al. 2018), and especially ensuring the direct interaction of consumers with the supply chain (Reino et al. 2013).

Mobile phones and the internet enable tourism destinations to increase the online presence and offline connectivity that is necessary to compete. While digital transformation provides the necessary tools and practices to make tourism management more efficient, it provides cheap access and multiple distribution channels to existing and potential customers (Law et al. 2018). Digitalization transforms existing jobs, requiring new skills to do new jobs, which may mean that the existing workforce must be re-trained or replaced by

workers who already have these skills (Yetkin, 2019). Tourism, like many other industries, undergoes digital transformation by restructuring certain traditional business models (Al Ford, 2020).

Table 1. Industrial Periods and Technology Phases in Tourism

	Industry 1.0	**Tourism 1.0**
Definition	The period that started with the invention of the steam engine in 1712 and was shaped by the formation of mechanical production facilities powered by steam.	The period that started with the acceleration of the transition to urban life, and families traveling outside of their birthplace
Characteristics	Mechanical Manufacturing	The emergence and development of the concept of tourism for all.
	Industry 2.0	**Tourism 2.0**
Definition	The period when mass production was possible with the use of electricity and electricity began to be widely used in manufacturing.	With the development of petroleum-based internal combustion engines, the period in which tourism activities were carried out in the form of tours, individually or in groups, with technological vehicles other than personal vehicles.
Characteristics	Division of labour and mass production	The facilitation and spread of transportation in tourism, the development of communication network.
	Industry 3.0	**Tourism 3.0**
Definition	Starting from 1970, the period of development in information technologies in which computers became widespread and automation systems were widely used in production.	After the rapid advancement of telecommunication, the period in which the communication network in tourism was faster and more accessible, automation and innovation developed to facilitate the life of tourists and tourism personnel
Characteristics	Automation of Manufacturing Processes	The phenomenon of sustainable tourism, development of internet and communication network, formation of the concepts of innovation and automation in tourism, green hotels.
	Industry 4.0	**Tourism 4.0**
Definition	The period based on dynamic data processing with the establishment of the connection between physical and digital systems	Tourism supported by initiatives provided at the destination to gather “data collected from human minds” on physical infrastructure, social connections, government agencies and establishments
Characteristics	Artificial intelligence, Internet of Things, Cloud Technology, Big Data, Simulation, Cyber Security, 3D Manufacturing, Augmented Reality	Virtual Reality, smart hotel management system, smart ticket (card) system, smart remote video monitoring system, smart tour guide system, smart travel agency system

Reference: (Atar, 220)

Related Research

Summaries of previous research and findings on digitalization, digital transformation and efficiency are given in the table below. The studies were listed in a chronological order starting from the oldest.

Table 2. Research on Digitalization, Digital Transformation, and Efficiency

Researcher/s	Year	Summary of Findings
Ülger, K, D/Külcü, Ö	2016	In the study, it was determined that the digitalization and digitalization efforts emerging with the developing technology play an important role in transmitting the common heritage of a country to future generations.
Atay, L/ Yalçınkaya, P/ Bahar, F	2019	In the study, it was concluded that the concept of the smart hotel was implemented within the scope of two themes; mobile applications, and personalized services. It was determined that 'one touch application', online check-in and online check-out services are used within the scope of mobile applications, and 'user profile note' and personalized room service applications are used within the scope of personalized services.
Aktaş, M	2019	In the study, 158 articles published between 2015-2018 in the related journals were analyzed in terms of research topic, research focus, theoretical perspective, and research orientation; the findings of the study were evaluated together with the findings of previous studies on the same subject, and current trends in the articles were discussed.
İbiş, S	2019	Within the scope of the study covering the tourism industry, the current use of robot technology in hotel management, travel establishments, restaurant establishments, airports, museums, and the tour guiding profession was analyzed, and future trends were identified.
Serin, D/ İşcan, E	2019	As a result of the study, it has been proven that there is a long-term relationship between information and communication technologies and productivity, which is in line with the literature.
Çakmak, K D/ Öcal, D	2020	It has been determined that Industry 4.0 is expected to provide advantages in terms of production, cost, competition, price and quality to establishments that successfully applied Industry 4.0 components to their systems and managed this transformation.
Yavuz A	2020	In the research, the managers expressed their views that digital will make significant contributions to the tourism industry and offer new alternatives and that it should be considered important as it supports the tourism industry.
Atar, A	2020	In the study, it has been concluded that the technological applications that enable the development of the tourism industry over time reduce the promotional costs of tourism establishments and increase customer potential thanks to the promotions made through social media.
Dönmez, İ/ Yurdakul, H/Taşmurat, T	2020	As a result of the study, it was found that the number of articles in the journals increased in parallel with the transition to the e-journal, and the subject of "new media" was increasingly discussed in these articles. In addition, it was found that the number of articles with multiple authors increased over the years.
Mesci, G/ Sağlık, E	2020	In the study, it has been determined that hospitals use digital communication resources effectively on their corporate websites and they have improved compared to their previous studies. However, it has been found that institutions do not perform well in social media accounts that they used as their other digital communication tool.
Bozkurt, V	2020	The possibility of digitalization of employees' jobs leads to significant alleviation in economic concerns. Although working online is a lifeline during the pandemic, it does not operate efficiently enough. The data shows that a significant part of the society has become more anxious and depressed.
Halaç, H, H/ Öğülmüş, V	2021	In the study, as a result of the statistical evaluations, whether the associations of the parameters on Openheritage3D were significant or not was demonstrated, and thus whether they had the parameters that should be in a sample open access cultural heritage application was evaluated.
Sucu, M	2021	In line with the findings of the study, a suitable organizational climate should be established in order to facilitate the adaptation of employees to digitalization activities and to ensure that they do not resist this change. In this context, it is expected that the study will be beneficial for establishments that are trying to digitize and for managers who carry out these processes.

METHOD

Data Collection Tool

The main purpose of this study is to collect information from managers of accommodation enterprises located within the borders of Sakarya province in the Marmara Region of Turkey about which digital tourism applications are being used in these enterprises and to evaluate their views on the effect of digitalization on

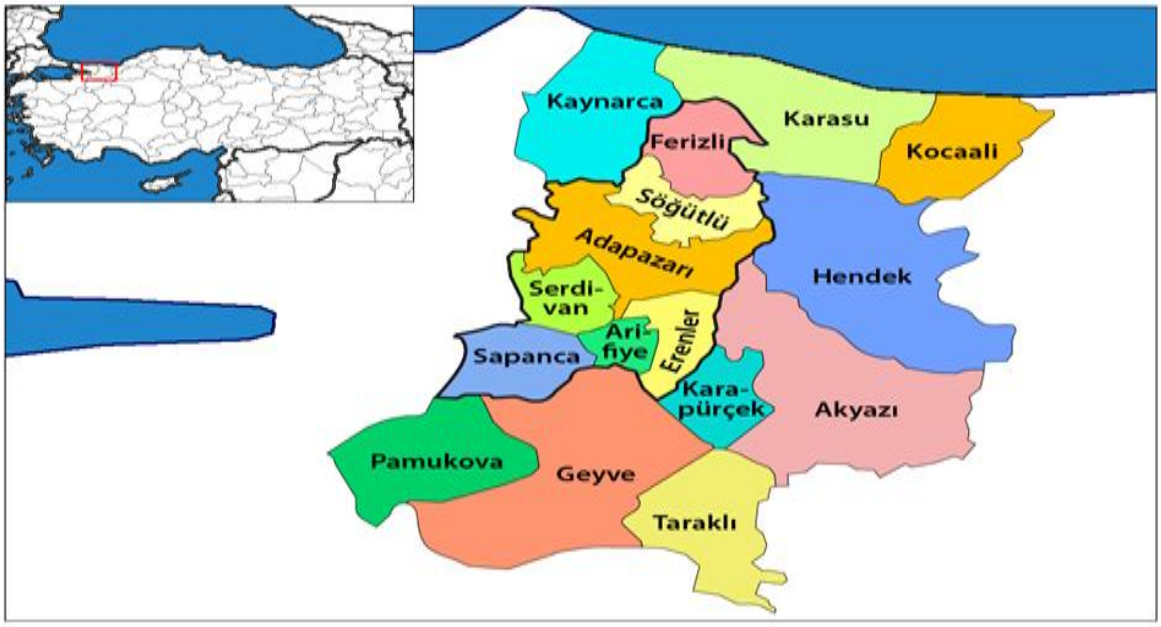
efficiency. There are studies in the literature that examine the developments and changes in digital tourism, which constitute the scope of this research (Ülger et al. 2016; Atay et al. 2019; Aktaş, 2019; İbiş, 2019; Serin & İşcan, 2019; Çakmak & Öcal, 2020; Yavuz, 2020; Atar, 2020; Dönmez et al. 2020; Mesci & Sağlık, 2020; Bozkurt, 2020; Halaç & Öğülmüş, 2021; Sucu, 2021). However, there is no research on the effect of digitalization on efficiency in the enterprises in Sakarya, which has been chosen as the area of this research. In the study, the following questions were asked in order to determine the digital applications used by the hospitality establishments and the perspectives of the managers on the impact of these applications on digital transformation and productivity;

- Is it important to use digital technology applications for your establishment?
- Have you had any problems with your establishment using digital applications?
- Does your establishment follow the digital applications of other tourism establishments?
- Are there any new digital technologies your establishment is considering implementing?
- Did the digital applications your establishment uses provide benefit in terms of efficiency and service quality?
- Does the use of digital applications by the personnel of your establishment have a positive effect on performance efficiency?
- Are there any security vulnerabilities (Cyber-attacks, etc.) in the protection of data obtained from digital applications in your establishment?

The research was carried out by the author. In order to evaluate the research in an unbiased manner, flexible interviews were used, and a natural interview was conducted by asking questions without guidance in order to gather detailed and in-depth information. In terms of the reliability of the research, the process of the analysis was concluded by explaining in detail when, where, and how many people it was conducted with.

Universe and Sample

The research covers the managers of hospitality establishments operating in Sakarya, which is the twentieth most populated province among the 81 provinces of Turkey and has important values in terms of the elements of tourism supply. Sakarya is surrounded by the Black Sea in the north, Kocaeli and Bursa in the west, Düzce in the east and Bolu and Bilecik in the south. It is the fifth largest city of the Marmara region. There are elements of tourism supply in Sakarya that can be used in various tourism activities. In terms of accommodation facilities, there is a bed capacity of 3402 in 23 touristic establishments (Sakarya Valiliği, 2021).



F

Figure 2: Map of Sakarya Districts (www.wikipedia.org).

In the research, the priority has been collecting the required amount of information rather than the sample size. For a purpose-oriented study, the necessary sample size was considered to be the sufficient number of managers in decision-making positions or in positions that affect decision-making processes. The study plan was to interview six five-star and eight four-star hospitality establishment managers in Sakarya. Establishments with four or more stars have been evaluated due to their financial status and their target customers in terms of using digital technology. For the study sample, interviews were conducted with 10 hospitality establishment managers. Four managers responded negatively to our interview request. The study was conducted face to face between 1 March 2021 and 1 June 2021.

Analysis of Data

The information obtained at the end of the study was organized by descriptive analysis method, analysed, and summarized. Qualitative research method was used in the study. With the aim of trying to reach a deep understanding with the analysis of the evaluations of the participants, the identification of subjective perspectives was adopted as a method (Baltacı, 2019). The reason why the research was conducted with qualitative methods is that the research area is suitable in terms of subject and scope and the subject of digital tourism can be investigated in more detail by face-to-face interview method. Qualitative research is important and valuable because it relies on the expression of subjective information such as interpretation and experience.

Ethics Committee Approval

In the research, permission was obtained from the Scientific Research and Publication Ethics Committee of Sakarya University of Applied Sciences, dated 31.05.2021 and numbered E-26428519-044-12657.

RESULTS

Demographic information in the study included statuses such as the gender, age, and education level of the participants. As indicated in the table below showing the demographic characteristics of the participants included in the study, seven of the managers were male and three were female. According to the data regarding the gender of the managers, it can be assumed that managers in the establishments are a male-dominated group.

Table 3. Demographic Characteristics of the Participants

Number	Gender	Age	Education
Manager No. 1	Male	41 years	Associate Degree
Manager No. 2	Female	35 years	Master's Degree
Manager No. 3	Male	44 years	Undergraduate
Manager No. 4	Female	56 years	High School
Manager No. 5	Male	51 years	Undergraduate
Manager No. 6	Male	45 years	Undergraduate
Manager No. 7	Male	48 years	Undergraduate
Manager No. 8	Male	53 years	Associate Degree
Manager No. 9	Male	55 years	Undergraduate
Manager No. 10	Female	52 years	Undergraduate

It can be understood from the table that the participants consist of managers between the ages of 35-56 years. It was determined that two of the managers had an associate degree, one had a graduate degree, one had a high school degree, and six had an undergraduate degree. The presence of managers with a high education level can be considered positive in terms of facilitating, encouraging, and leading the adoption and implementation of digital applications in the establishments. In the study, participating managers were represented as M1, M2, M3, M4, M5, M6, M7, M8, M9, M10 interview examples;

Table 4. Managers' Views on the Importance of Digital Applications

Theme	Categories and Codes	Participants
Importance of Digitalization	Yes	M1,M2,M3,M4,M5,M6,M7,M8,M10
	No	
	Neutral	M9

While 90% of the managers emphasized that the use of digital applications in establishments is important, one manager stated that he was neutral. The statements of some of the managers on this subject were as follows.

M4: *"Without technology, it is not possible for hotel management to be in current conditions. In terms of hotel management systems, digital applications are vital in issues such as accounting, cost, stock control, order, reservation, and follow-up of guests."*

M6: *"Today, we live in the age of technology. Therefore, as is the case in all areas of our lives, it is impossible not to benefit from technology in hospitality establishments."*

M10: *"Technology is a very important issue for tourism establishments. The ability of establishments to compete and develop depends on using and following technology."*

Three of the participating managers made detailed explanations about the importance of using digital applications in tourism establishments, while six managers only answered yes and one manager stated that he was neutral.

Table 5. Managers' Views on the Problems Experienced When Using Digital Applications

Theme	Categories and Codes	Participants
Problems in Digitalization	Yes	M5,M6
	No	M1,M2,M3,M4,M7,M8,M9,M10
	Neutral	

While two of the managers stated that they had difficulties in using digital technology, eight managers stated that they did not experience any difficulties. The common point emphasized by the managers who did and did not experience difficulties is that there are minor service disruptions caused by inexperience when using new applications after the training. All managers considered it a problem that digital applications impose a significant cost expense on establishments despite their importance. The statements of some of the managers on this subject were as follows.

M5: *"The most important problem was in terms of cost. Digital technology is useful but very expensive. Since digital technology is imported, paying in foreign currency increases the cost."*

M6: *"As managers, we don't want to spend too much money on technology. In addition, I think that one of the problems experienced is the cost of the qualified personnel who will use the technology."*

M2:*"We completed the training of the personnel on usage without much trouble. Although it caused some problems for our establishment in terms of cost, we managed to overcome the process without much difficulty."*
While three of the managers detailed their statements about whether there are problems in the use of digital applications, eight managers stated that they did not experience any problems.

Table 6. Managers' Views on Monitoring Other Establishments' Digital Applications

Theme	Categories and Codes	Participants
Follow-up of competitors	Yes	M1,M2,M3,M4,M5,M6,M7,M8,M9,M10
	No	
	Neutral	

All of the participants stated that they follow the digital applications of other establishments. In the question on this subject, the managers clearly responded yes, and none of them responded no or stated that they were neutral. The views of the managers who preferred to give detailed answers are as follows.

M3: *"As a hotel establishment, we use the latest technology used by the establishment we are affiliated with. We are following up other establishments too."*

M8: *"We are somewhat trying to follow up. Of course, this follow-up is also related to the demand of the*

customer profile we serve. Especially during the pandemic, I approve of the services toward digitalization that will provide less contact."

M9: *"I do follow up. We try our best to follow up competitors who implement global practices and changes."*

Table 7. Managers' Views on the Existence of New Digital Applications They Consider Implementing

Theme	Categories and Codes	Participants
New Digital applications	Yes	M1,M2,M4,M7
	No	M3,M5,M6,M9,M10
	Neutral	M8

According to the managers' responses to the question about the existence of new digital applications that they intend to use in their establishments, four managers stated that they are considering using new digital applications, five managers stated they are not, and one manager stated that he was neutral on this subject. The views of some of the managers who needed make a detailed explanation are as follows:

M3: *"For now, I am not considering any new digital applications."*

M4: *"We are using Opera and Alice software. We are making plans to develop the CRM module and integrate it into the system. We want to get up-to-date versions of the systems we currently use."*

M7: *"We would like to use more developed versions of Planet21, attendify, auditor, yammer, boxer applications."*

M9: *"I think that the digital applications that our establishment has are sufficient for now."*

Table 8. Managers' Views on the Benefit of Digital Applications in Terms of Efficiency and Service Quality

Theme	Categories and Codes	Participants
Efficiency of Digitalization	Yes	M1,M2,M3,M4,M5,M6,M7,M9,M10
	No	
	Neutral	M9

According to the views of the participating managers about the benefits of using digital applications in their establishments in terms of efficiency and service quality; nine managers said yes and declared that 90% of digitalization had a positive impact on productivity and service quality, while one manager said he was neutral. Some managers made detailed explanations on this subject, which are provided below.

M1: "Digitalization provides benefits in terms of customer satisfaction, getting ahead of competitors, and creating brand value."

M2: "I think our personnel have contributed to their personal development thanks to digital applications. I can say that while they do their work more easily with digital applications, it contributed to their motivation."

M9: *"I am neutral on this subject. In fact I did not think about that in detail."*

M7: *"It reduces the workload and we can do more with fewer personnel. It increases the quality of our work."*

M5: *"While digital applications seem to increase costs in the short term, they have cost-reducing effects in the long term. The greatest benefit is that you save time."*

M4: *"It is significantly labour-saving. It is useful in terms of speed and quality service. It increases the efficiency of personnel. It partially decreases employment."*

Table 9. Managers' Views on the Effect of Digital Applications on Performance Efficiency

Theme	Categories and Codes	Participants
The Effect of Digitalization	Yes	M1,M2,M3,M4,M5,M6,M7,M8,M10
	No	
	Neutral	M9

To the question asked to the managers about whether the use of digital applications by the personnel in the establishment has a positive contribution to the performance efficiency, nine managers responded yes, and one manager said that he was neutral. Some of the managers made detailed explanations on this subject.

M2: *"While our personnel offered better quality service by learning new information, their performance was positively affected."*

M4: "Accounting control, which was performed by three people before starting to use digital applications, is now performed by one person in a shorter time and with less error. I will raise this point in the coming executive board meetings. It is necessary to make a comparison of our personnel expenses before digital applications and our personnel expenses after digital applications. I am also curious to know."

M5: "Within the scope of digital applications, we perform both reservation, check-in and check-out processes in the front office in a shorter time with a high level of customer satisfaction."

M6: *"It contributes positively to performance efficiency by reducing the stress intensity of our personnel who provide service in a shorter time."*

M8: *"Our staff acquired awareness of new technologies. When they become managers themselves, they can follow the usage of their personnel by easily using the technologies they already know."*

M9: "I am neutral on this subject. I think things are going just fine."

M10: *"Thanks to digital technology, we can reach the documents we want in a short time, unnecessary workload decreases and performance efficiency increases. It contributes to performance efficiency by reducing physical fatigue."*

Table 10. Managers' Views on Whether Digital Applications Will Cause Security Vulnerabilities

Theme	Categories and Codes	Participants
The Vulnerability of Digitalization	Yes	M1,M2,M3,M6,M9,
	No	M4,M5,M8,M7,M10
	Neutral	

According to the opinions of the managers on whether there is a security vulnerability in the protection of the data obtained by the use of digital applications; it can be seen that five managers said that security vulnerabilities will occur, while five managers stated that security vulnerabilities will not occur. None of the managers were neutral on this subject. Some of the managers made detailed explanations on this subject. These explanations are as follows:

M2: *"As a threat, it is necessary to pay attention to the human factor responsible for the data storage part of digital applications. If the wrong human factor is used, there can be problems."*

M3: *"I think that establishments should not outsource the supply of digital applications. In our establishment, we control and monitor these applications with our own IT department. There may be a risk that crashing of the*

application will negatively impact the service."

M5: *"I don't think it will be a problem because our infrastructure is solid. I think every threat has a defence system. I don't think there will be a problem after taking the necessary security measures."*

M8: *"I think if there is a threat, there is a precaution. I trust in cyber security systems. We take the necessary measures to ensure digital media security in our establishment. Therefore, I do not think that a security vulnerability will occur."*

M9: "İf you do not have enough qualified personnel to manage and control digital platforms, a security vulnerability will occur. Personnel recruitment should be done after including this subject in the strategy and planning by the human resources management. The young age of our hotel personnel gives us an advantage, as they are more tech-savvy. It is possible for them to learn and use new applications in a shorter time and with shorter training."

M10: "In our establishment, our digital applications are managed and controlled by the central unit, as we are affiliated with the brand chain. Security is taken very seriously and our customers' information is protected against cyber-attacks with the highest level of cyber security practices."

Table 11. Managers' Views on the Presence of Digital Applications in Their Establishments

Digital Applications	We have them in our hotel.	We do not have them in our hotel.
Personalized Services (Recording customers' used or past preferences in the database)	M1,M2,M3,M6,M7 M4,M5,M8,M9,M10	
Kiosk (Access to all services with mobile application)	M1,M2,M3,M6,M7 M4,M5,M8,M9,M10	
Smart Cards Used Inside the Hotel	M1,M2,M3,M6,M7 M4,M5,M8,M9,M10	
Child Tracker Bracelets		M1,M2,M3,M6,M7 M4,M5,M8,M9,M10
Pay-Tv channels / Pay and View	M3,M7,M5,M9,M10	M1,M2,M4,M6,M8
In-Room Music Systems	M1,M3,M4,M5,M6,M7,M9,M10	M2,M8
In-Room Video Gaming Systems		M1,M2,M3,M4,M5,M6,M7,M8,M9, M10
In-Room Guest Control Panel	M5,M6	M1,M2,M3,M4,M7,M8,M9,M10
Digital Welcome Systems	M6	M1,M2,M3,M4,M5,M7,M8,M9,M10
In-Room Motion Sensor / Detector		M1,M2,M3,M4,M5,M7,M8,M9,M10
International Battery Charger	M3,M4,M5,M6,M7,M8,M10	M1,M2,M9
Websites for Digital Reservation and Information (TripAdvisor, Review pro, etc.)	M1,M2,M3,M6,M7 M4,M5,M8,M9,M10	
Plate Reader Systems for Security		M1,M2,M3,M6,M7 M4,M5,M8,M9,M10
Smart Building Systems	M5	M1,M2,M3,M6,M7 M4,M8,M9,M10
Hotel Applications Downloadable to Smartphones	M1,M2,M3,M6,M7 M4,M5,M8,M9,M10	
Smart Waiter (Customer information/the ability to offer customer-specific menu recommendations)	M3,M6,M7,M8	M1,M2,M4,M9 M10,M5
Personnel Performance Management System	M1,M2,M3,M6,M7, M4,M5,M8,M9,M10	
Smart Hotel Resources Management (Keeping real-time data on stock status)	M1,M2,M3,M6,M7,M10	M4,M5,M8,M9
If there are other objects/applications, please specify.	M3: We have a thermal camera at the hotel entrance to measure body temperature.	

According to the table above, all managers (10 Managers) responded yes to the question of whether their establishment had and used personalized services (Recording customers' used or past preferences in the database). Again, all ten managers responded yes to the question of whether their establishment had and used the Kiosk service (Access to all services with mobile application). All participants stated that their establishment had and used in-hotel smart cards. None of the establishments had child tracker bracelets. According to the information obtained from the participants, five establishments had pay-TV channels and five did not.

While in-room music systems were used in eight of the establishments that were the subject of the study, these systems were not available in two establishments. It was found that none of the establishments had in-room video gaming systems. While eight hotel establishments did not have an in-room guest control panel, two establishments had it. It was found that digital welcome systems were not available in nine establishments. Digital welcome systems were used in only one of the establishments. It was found that none of the establishments had in-room motion sensor. International battery charger was found in seven establishments and was not found in three establishments. All of the establishments used digital reservation information system. It was found that none of the establishments had plate reader systems for security and smart building systems. Hotel applications downloadable to smartphones were available in all establishments. Smart waiter application was found in four establishments whereas it was not available in six establishments. Managers stated that personnel performance management systems were used by all establishments. While the smart hotel resources management application was used by six hotels, it is not used by four establishments. As a practice not included in the questions, one establishment stated that they had thermal cameras measuring body temperature at the entrance.

DISCUSSION AND CONCLUSION

Due to the structure of the tourism industry, which is formed by the combination of many different products, it is important to properly manage the business intelligence and technology behind these. The tourism industry should read the digital transformation practices in other industries it works with, and make investment plans that will transform it into its own service production. It is not possible for the Industry 4.0 movement, which is effective in all industries in the world, not to be effective in tourism. Digital transformation is not limited to tourism establishments to design the most beautiful websites or mobile applications. The tourism industry, as an industry in which human and individual relations are at the forefront, should determine with good strategies in its current environment how it will adapt to technological change and where it will invest.

Comparing traditional holiday practices with current practices will be useful in observing the change as evidence of the tourism industry's adaptation to digital transformation. In traditional holiday practices, situations such as high costs, unsafety, difficulties in transportation, and long travel durations result in not everyone being able to go on vacation. With the development of information technologies, going on vacation has become an organization that is more economic, safer, with shorter travel time, and easily accessible to everyone. All kinds of travel planning can be done easily through smartphone applications and computers.

Thanks to digitalization, tourists make their choices by taking into account the comments of people who have had a holiday experience before. While tourists benefit from tourism and travel blogs on the internet as a guide, they can make payment transactions with online banking. Augmented reality application, which is one of the digital tourism applications, is a system that provides experience of touristic places. Digital menu, smart table, smart plate applications in food and beverage establishments, and e-guidance services in museums and archaeological sites are applications that provide convenience.

Today, the communication opportunities provided by social media and mobile technologies have caused all industries to need to implement innovations in order to communicate more effectively and powerfully to monopolize and develop potential markets. The development of internet technologies and power of communication has attracted the attention of all industry companies to this field. While the dynamic structure of new communication tools provides useful areas of use, it can also create various difficulties in terms of management. It will not be correct and sufficient to consider digital transformation only as technological transformation. The success of digital transformation is possible with a leadership approach that defines business processes digitally, creates a talented and innovative staff, takes risks for organizational culture, and integrates technology with all elements. In establishments, transferring business processes to automation systems, defining the changing roles and responsibilities of employees according to digital systems is an important process in terms of increasing productivity.

The success of the digital transformation goals of the establishments is directly proportional to the increase in service production efficiency, depending on the use of the human factor in the right position. The use of the human factor in the right position will contribute significantly to the establishments in terms of efficiency. Success of digitalization practices in Turkish tourism is possible with education. It is important that the unqualified workforce in tourism transform into a more skilled workforce that can use digital technologies in tourism. For this reason, it is imperative to make changes in education before encountering the problem of training manpower compatible with Industry 4.0 technologies that will work in tourism. In Turkey, which is a country of tourism with a young population, raising students who cannot use digital applications will not contribute to tourism. Apart from this, the workforce that cannot use smart hotel, smart destination, smart tourism applications may turn to other industries.

Establishments have a desire to realize and sustain digital transformation. The important thing is that the adaptation process in digital transformation is carried out flawlessly and completely. It is important for establishments to have sufficient and strong infrastructure to succeed in digital transformation. While digital change applications create a need for qualified personnel, it also causes a decrease in the number of employed personnel as a positive effect in service production. Future digital transformation strategies should be determined by identifying the strengths and weaknesses that digital transformation will generate in establishments. In addition to the positive aspects of digital transformation, taking necessary precautions concerning cyber-attacks is of vital importance in terms of protecting customer information.

According to study data; managers stated that it is important to use digital technology applications in their establishments. In their answer to the question of whether there are problems in the use of digital technology, the managers said that they did not experience any problems, but that the personnel may have training deficiencies regarding digital applications. Managers stated that they follow the digital technology applications of competitor establishments in order not to lose their competitive advantage and to ensure service quality. While four of the managers stated that they are considering using new digital applications, five of them stated that they are not considering it for the time being, and only one manager stated their neutrality on the subject. Nine of the managers stated that the digital applications used in their establishments provided positive benefits to their productivity and service quality. Likewise, according to the statements of the managers, it was understood that the use of digital applications by the personnel working in the establishments contributed positively to their performance efficiency. While half of the managers stated their view that digital applications would create security vulnerabilities, the other half thought that if necessary precautions are taken, they will not cause any problems in terms of security.

Digitalization, which is the lifeblood of tourism marketing today, enables hotel establishments to be preferred due to their good infrastructure. It is not possible for hotel establishments to stay out of the digital transformation process. The difficulty created by the continuous digital change requires that this process be carried out with patience and determination. Establishments that understand the importance of digitalization get important results in terms of service quality and efficiency with the investments they make. The important thing is to get a transformation package suitable for the structure of the establishment. In the near future, applications such as 5G, instantaneous personalized suggestions, full use of mobile applications, robot assistants, hotels that transform according to demand, the presence of 3D printers in the rooms, and augmented reality hotels await hotel establishments. Again, in the near future, as digital applications in hotel establishments, customers can be provided with opportunities such as face recognition at the room entrance, sensors that track the customers, televisions that talk and respond with voice, touch-operated and interactive surfaces, smart toilet systems, smart mirrors, dirt-proof, Nano towels, automatic wireless adjusted temperature system controls, personalized pillows and beds, in-room personalized experiences, sports competitions and hologram concerts.

Digital technology will accelerate the hospitality establishments operating in Sakarya. The implementation of digitalization will benefit the development of establishments and the development of their economies. Establishments that follow digital developments, have a vision of innovation in terms of science and technology, and transform the service production into a way that will adapt to innovations, will be able to continue their existence. It can be said that the use of rapidly developing information and communication technologies in the tourism industry will be effective in increasing the quality of service production and personnel performance.

RECOMMENDATIONS

Issues such as what kind of services tourism establishments will offer to tourists and what position the service personnel will take in the new digital transformation can be counted among the issues to be investigated in the coming years. In addition, studies to determine the positive and negative aspects of digital transformation of tourism establishments in terms of efficiency can be carried out on different destinations and different hospitality establishments. Thanks to the studies on different destinations and different accommodation businesses, comparisons can be made and the most accurate digital transformation implementation, planning and strategies can be determined.

It is predicted that this study will contribute to the literature on the subject, especially in Sakarya, other cities, and accommodation enterprises. However, the research does not include a large number of managers due to the limited number of accommodation enterprises in Sakarya and the time constraints of the managers. For this reason, the sample size can be increased in future research by including more diverse accommodation enterprises and managers with more diverse demographic characteristics. Increasing the sample size can make positive contributions to the comparison of research results. It will be more beneficial for accommodation enterprises to use digital platforms that offer hotel guest recognition, loyalty programs, and creative and innovative systems. Accommodation enterprises can have sustainable efficiency by directing their energies to digital technology. By creating teams that can manage and develop technology in enterprises, the necessary arrangements can be made quickly according to the feedback provided by the customers.

ETHICAL TEXT

In the study, permission was obtained from the Social and Human Sciences Scientific Research and Publication Ethics Committee of Sakarya University of Applied Sciences, dated 31.05.2021 and numbered E-26428519-044-12657. “In this article, the journal writing rules, publication principles, research and publication ethics, and journal ethical rules were followed. The responsibility belongs to the author (s) for any violations that may arise regarding the article. "

Author(s) Contribution Statement: This article has been prepared with 100% contribution from the author.

REFERENCES

Acatech., (2013). Acatech: Recommendations for Implementing the Strategic Initiative Industry 4.0, *Final Report of the Industry 4.0 Working Group,* http://www.acatech.de/fileadmin/user_upload/ Industrie_4.0/Final_report__Industrie_4.0_accessible.pdf, 1-82, (Date of access: 03.05.2021).

Adeolaa, O., & Evans, O. (2019). Digital Tourism: Mobile Phones, İnternet and Tourism in Africa*, Tourism Recreation Research*, 44(2), 190–202, https://doi.org/10.1080/02508281.2018.1562662.

Aktaş, M. (2019). Dijital İletişim ve Halkla İlişkiler Araştırmaları: Uluslararası Literatürde Güncel Yönelimler ve Tartışmalar, *İletişim Kuram ve Araştırma Dergisi*, 48, 65-78.

Alivizatou, M. (2021). Digital Intangible Heritage: Inventories, Virtual Learning and Participation, *Heritage & Society,* DOI: 10.1080/2159032X.2021.1883950, 12(2-3), 116-135.

Alford, P., & Jones, R. (2020). The lone Digital Tourism Entrepreneur: Knowledge Acquisition and Collaborative Transfer, *Tourism Management*, 81:104139.

Arikan, E., Bayram, T. A., Kavlak, T. H., & Bayram, E. G. (2021). Turizm Öğrencilerinin Endüstri 4.0 Kavramsal Farkındalık Düzeyleri ve Teknoloji Kullanım Alışkanlıkları Arasındaki İlişki, *Türk Turizm Araştırmaları Dergisi*, 5(1), 19-33.

Atar, A. (2020). Gelenekselden Dijitale Turizm Sektörü, *Türk Turizm Araştırmaları Dergisi*, 4(2), 1640-1654.

Atay, L.., Yalçinkaya, P., & Bahar, F. (2019). İstanbul'daki Akıllı Otel Uygulamalarının Değerlendirilmesi, *Manas Sosyal Araştırmalar Dergisi*, 8(1), 667-678.

Baltacı, A. (2019). Nitel Araştırma Süreci: Nitel Bir Araştırma Nasıl Yapılır?, Ahi Evran Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 5(2), 368-388.

Berlak, J., Hafner, S., & Kuppelvesser., G. V. (2021). Digitalization's impacts on productivity: a model-based approach and evaluation in Germany's building construction industry, *Production Planning & Control*,32(4), 335-345,DOI: 10.1080/09537287.2020.1740815.

Benyon, D., Quigley, A., & O'Keefe, B. (2014). Presence and Digital Tourism. *AI, Soc* 29, 521–529 https://doi.org/10.1007/s00146-013-0493-8.

Bozkurt, V. (2020). Pandemi Döneminde Çalışma: Ekonomik Kaygılar, Dijitalleşme ve Verimlilik, *İstanbul Üniversitesi Yayınevi,* E-ISBN: 978-605-07-0729-8, (5264): 115-136, DOI: 10.26650/B/SS46.2020.005.08.

Çakmak, K, D., & Öcal, D. (2020). Endüstri 4.0'ın Endüstrilerin Yapısı ve Paydaş İlişkileri Üzerine Yansımaları. *Selçuk Üniversitesi Sosyal Bilimler Meslek Yüksekokulu Dergisi,* 23(2), 684-705. DOI: 10.29249/selcuksbmyd.682886.

Çalımlı, Y. (2019). Turizm İşletmelerinde Bilgi Teknolojileri ve Dijital Dönüşüm: Konya Örneği, *(Yayımlanmamış Yüksek Lisans Tezi).* Selçuk Üniversitesi.

Davutoğlu, N. A., Akgül, B., & Yıldız, E. (2017). İşletme Yönetiminde Sanayi 4.0 Kavramı İle Farkındalık Oluşturarak Etkin Bir Şekilde Değişimi Sağlamak, *Asos Journal-Akademik Sosyal Araştırmalar Dergisi*, 5(52), 545-567.

DE Carolis, B., Novielli, N., Plantamura, V., & Gentile, E. (2009). Generating Comparative Descriptions of Places of İnterest in the Tourism Domain. *In Proceedings of the third ACM conference on recommender systems ACM, New York*, 277–280, DOI: 10.1145/1639714.1639767, 1-5.

Dönmez, İ., Yurdakul, H., & Taşmurat, T. (2020). Dijitalleşme ve Akademik Yayıncılık: İletişim Fakültesi Dergileri Üzerine Nicel Bir Araştırma, *Selçuk İletişim*, 13(3), 1231-1263.

Drath, R., & Horch, A. (2014). Industrie 4.0: Hit or Hype?, *IEEE industrial electronics magazine*, 8(2), 56-58.

Durrant, A., Golembewski, M., Kirk, D., Benford, S., Fischer, J., Rowland, D., & Mcauley, D. (2011). Automics: Souvenir Generating Photoware for Theme Parks. *Annual conference on Human factors in computing systems New York,* 1767–1776, DOI: 10.1145/1978942.1979199.

Durrant, A., Golembewski, M., Kirk, D., Benford, S., Rowland, D., & Mcauley, D. (2011). Exploring a Digital Economy Design Space in Theme Parks. In: *Proceedings of the second conference on creativity and*

innovation in design (DESIRE '11). ACM, New York, 273–284, DOI: 10.1145/2079216.2079256.

Erkmen, B., & Güler, G. E. (2020). Turizm ve Dijitalleşme: 'Haskovo-Edirne Kültürel ve Tarihi Destinasyonlar Projesi' Örneği, *Tourism and Recreation*, To & Re 2020, 2 (Ek 1), 111-118.

Fleischmann, A., Friedl, A., Großmann, D., & Schmidt, S. (2020). Modeling and Implementing of Industrie 4.0 Scenarios, *https://doi.org/10.1007/978-3-030-72696-6_4, 1401: 1-24,* (Date of access:10/05/2021).

Gider, M. (2020). Turizm Pazarlaması Kapsamında Dijitalleşme Sürecinin Turizm Sektörü Üzerindeki Etkileri: Nitel Bir Araştırma, (Yayınlanmamış Yüksek Lisans Tezi). Akdeniz Üniversitesi. *https://acikbilim.yok.gov.tr/handle/20.500.12812/32498.*

Halaç, H, H., & Öğülmüş, V. (2021). Kültürel Miras Verilerinin Dijital Olarak Depolanması: Openherıtage3d Örneği, *The Turkish Online Journal of Design, Art and Communication*, ISSN: 2146-5193, 11(2), 521-540.

https://tr.wikipedia.org/*wiki/Sakarya*. (Date of access: 28.05.2021).

İbiş, S. (2019). Turizm Endüstrisinde Robotlaşma, *Türk Turizm Araştırmaları Dergisi*, 3(3), 403-420.

Kagermann, H., Wahlster, W., & Helbig, J. (2013). Recommendations for Implementing the Strategic Initiative Industrie 4.0, *Final report of the Industrie 4.0 Working Group,* 13-78. https:Users/ismail/Downloads/Final report Industrie_4.0_accessible.pdf, (Dateofaccess:10.05.2021).

Konstantinou, J. K. (2016). Digitization of European SMEs in Tourism and Hospitality: The Case of Greek Hoteliers, World Academy of Science, *Engeeniring and Technolgy International Journal of Social and Tourism, Science,* 10(5), 1558-1562.

Kürşat, A., & Sayın, K. (2019). Dijital Turizm, *Eğitim Yayınevi,* Konya.

Law, R., Chan, I. C., & Wang, L.. (2018). A Comprehensive Review of Mobile Technology Use in Hospitality and Tourism. *Journal of Hospitality Marketing & Management*, 27(6), 626–648.

Maryanne, M, G. (2018). Digitalization, Digitization, and Innovation, *Research-Technology Management*, 61(4), 56-59, DOI: 10.1080/08956308.2018.1471280.

Mesci, G., & Sağlık, E. (2020). Sağlık Turizminde Dijital İletişim: JCI Akreditasyon Belgesini Almış Hastaneler Üzerinde Bir Araştırma, *Journal of Hospitality and Tourism Issues*, 2(1), 74-90. Retrieved from https://dergipark.org.tr/en/pub/johti/issue/55264/742897.

Özkan, M., Al, A., & Yavuz, S. (2018). Uluslararası Politik Ekonomi Açısından Dördüncü Sanayi Endüstri Devrimi'nin Etkileri ve Türkiye, *International Journal of Political Science and Urban Studies*, 6(2), 126-156

Öztürk, F. Kayar, A., & Vatansever, A. (2019). Advanced Manufacturıng Wıth Industry 4.0 Applıcatıons*, 5th İnternatıonal Conference On Advances In Mechanıcal Engıneerıng İstanbul 2019*, 17-19, 1-7.

Pamuk, N. T., & Soysal, M. (2018). Yeni Sanayi Devrimi Endüstri 4.0 Üzerine Bir İnceleme, *Verimlilik Dergisi, 1(1), 41–66.*

Reino, S., Alzua-Sorzabal, A., & Baggio, R. (2013). What matters to the industry? An Evaluation Framework for the Adoptability of Online Tourism Distribution Platforms. *20th International Conference on Information Technology and Travel & Tourism,* January, 23-25, https://www.iby.it/turismo/papers/baggio_ TURISMlink_Enter2013.pdf. (Date of access: 28.05.2021).

Serin, D., & İşcan, E. (2019). Bilgi ve İletişim Teknolojilerinin Verimlilik Üzerine Etkisi: Türkiye Örneği. *Verimlilik Dergisi*, (3), 41-55. from https://dergipark.org.tr/en/pub/verimlilik/issue/45968/405073.

Serinikli, N. (2018). Endüstri 4.0'ın Özel, Kamu ve Kooperatif Sektörlerine Etkisi*, Süleyman Demirel Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 23, 1607-1621.

Schering, A, C., Dueffer, M., Finger, A., & Bruder, I. (2009*).* A Mobile Tourist Assistance and Recommendation System Based on Complex Networks*.* In Proceedings of the 1st ACM international workshop on *Complex networks meet information & knowledge management*. New York, 81–84. DOI: 10.1145/1651274.1651290. (Date of access: 28.05.2021).

Soylu, A. (2018). Endüstri 4.0 ve Girişimcilikte Yeni Yaklaşımlar, *Pamukkale Üniversitesi Sosyal Bilimler Enstitüsü Dergisi,* 32, 43-57.

Sucu, M. (2021). Çalışanların Dijitalleşme Faaliyetlerine Uyumu ve Örgüt İklimi Arasındaki İlişkiyi Tespit Etmeye Yönelik Bir Araştırma, *The Journal of International Social Research* 14(77), www.sosyalarastirmalar.com Issn: 1307-9581.

T.C. Sakarya Valiliği, (2015), http://www.sakarya.gov.tr/(Date of access: 09.09.2021).

Topsakal, Y., Yüzbaşıoğlu, N., & Çuhadar, M. (2018). Endüstri Devrimleri ve Turizm: Türkiye Turizm 4.0 Swot Analizi ve Geçiş Süreci Önerileri, *Süleyman Demirel Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, C.23, Endüstri 4.0 ve Örgütsel Değişim Özel Sayısı, 1623-1638.

Ülger, K, D., & Külcü, Ö. (2016). Dijitalleştirme Çalışmalarına Kültürel Miras Ölçeğinde Genel Bir Bakış: VEKAM Örneği, *Akademia Disiplinlerarası Bilimsel Araştırmalar Dergisi* 2(1), 42-55.

Wang, Y., De Almeida, Correia, G. H., Van Arem, B., & Timmermans, H. H., (2018). Understanding Travellers' Preferences for Different Types of Trip Destination Based on Mobile İnternet Usage Data. *Transportation Research Part C: Emerging Technologies*, 90, 247–259. https://reader.elsevier.com/reader/sd/pii/(Date of access: 28.05.2021).

Yavuz, A. (2020). Turizmde Dijital Dönüşüm: Otel Yöneticilerinin Bakış Açılarının İncelenmesi. *(Yayımlanmamış Yüksek Lisans Tezi).* https://9lib.net/document/myjr.html. (Date of access: 28.05.2021).

Yetkin, Y. (2019). Konaklama İşletmelerinde Dijitalleşme ve Dijitalleşmenin Sürdürülebilir Turizm ile İlişkisi*, (Yayımlanmamış Yüksek Lisans Tezi)*. https://tez.yok.gov.tr/UlusalTezMerkezi/tezDetay. (Date of access: 28.05.2021).