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IMPACTS OF TECHNOLOGICAL DEVELOPMENT ON EMPLOYMENT STRUCTURE OF TOURISM INDUSTRY

Asst. Prof. Simge KÖMÜRCÜ [*]

Lect. Selin İŞEVCAN ERTAMAY [*]

Prof. Mehmet Emre GÜLER [*]

ABSTRACT

Purpose: Dynamic development of modern technology is undeniable, and applications resulting from modern technology have already influenced the employment of services in the tourism industry. The purpose of this study is to examine possible structural changes and provide resourceful perspectives with the extent of how far the technological advances brought by Industry 4.0 will substitute for the manpower.

Methodology: The research was conducted using a face-to-face interview technique, which is one of the methods of qualitative research in order to examine the effect of Industry 4.0 on the employment structures of the tourism industry in detail. Semi-structured interviews were conducted by adding some questions that made the study original.

Design/Approach: 17 semi-structured face to face interviews were conducted with tourism industry managers based in Turkey to find out foreseen impacts of current technological improvements on the labour structure of the tourism industry. The reason for conducting a semi-structured interview is that this technique allows the elaboration of the research by asking additional questions, although the questions are determined.

Findings: The results of this study indicate that dehumanization is not possible at all levels of tourism services, and technological developments lead to a task-sharing work environment between the manpower and robots. New occupations emerge while some are being eliminated. Demographic factors are prominent in the technological adaptation of both by customers and employees.

Originality: This study is important in terms of seeing the perspectives of manpower in tourism within the framework of smart industry development and seeing the needs for its development. The conclusion provides managerial and theoretical perspectives resulted from study findings.

[*] Izmir Katip Çelebi University, Department of Tourism Management, İzmir, Turkey. E-mail: simge.komurcu@ikcu.edu.tr
[*] İzmir University of Economics, Department of Gastronomy and Culinary Arts, İzmir, Turkey. E-mail: selin.isevcan@ieu.edu.tr
[*] Izmir Katip Çelebi University, Department of Tourism Management, İzmir, Turkey. E-mail: memre.guler@ikcu.edu.tr

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TURİZM ENDÜSTRİSİNDE TEKNOLOJİK GELİŞMELERİN İŞGÜCÜ ÜZERİNDEKİ ETKİLERİ

ÖZET

Amaç: Modern teknolojinin dinamik yadsınamaz gelişimi ve modern teknolojiden kaynaklanan uygulamalar turizm endüstrisindeki hizmetlerin kullanımını etkilemektedir. Bu çalışmanın amacı, olası yapısal değişiklikleri incelemek ve Endüstri 4.0'ın getirdiği teknolojik ilerlemelerin insan gücünün yerini ne ölçüde alacağı konusunda bakış açısı sağlamaktır.

Metodoloji: Araştırma, Endüstri 4.0'ın turizm sektörünün istihdam yapısı üzerindeki etkisini detaylı olarak incelemek amacıyla nitel araştırma yöntemlerinden biri olan yüz yüze görüşme tekniği kullanılarak yapılmıştır. Araştırmayı özgün kılan bazı sorular eklenerek yarı yapılandırılmış görüşmeler yapılmıştır.

Tasarım / Yaklaşım: Mevcut teknolojik gelişmelerin turizm sektörünün işgücü yapısı üzerindeki öngörülen etkilerini ortaya çıkarmak için Türkiye'deki turizm sektörü yöneticileri ile 17 yarı yapılandırılmış yüz yüze görüşme yapılmıştır. Yarı yapılandırılmış görüşme yapmanın nedeni, bu tekniğin, sorular belirlenmesine rağmen ek sorular sorarak araştırmanın detaylandırılmasına izin vermesidir.

Bulgular: Bu çalışmanın sonuçları, turizm hizmetlerinin her düzeyinde insandışılaştırmanın mümkün olmadığını ve teknolojik gelişmelerin insan gücü ve robotlar arasında görev paylaşımı bir çalışma ortamına yol açtığını göstermektedir. Bazıları ortadan kaldırılırken yeni meslekler ortaya çıkabilecektir. Hem müşteriler hem de çalışanlar tarafından teknolojik adaptasyonda demografik faktörler öne çıkmaktadır.

Özgünlük: Bu çalışma, turizmdeki insan gücünün akıllı endüstri gelişimi çerçevesinde bakış açısını görmek ve gelişmesi için ihtiyaçları görmek açısından önemlidir. Sonuç, çalışma bulgularından elde edilen yönetsel ve teorik perspektifler sağlayacaktır.

Anahtar Kelimeler: *İnsandışılaştırma, Yapay Zekâ, İnsan-Makine Etkileşimi, Turizm, Endüstri 4.0.*

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1. INTRODUCTION

Jacob Bigelow, a physician, is the first who coined the term “technology” as “the application of the sciences to the useful arts” (The Cultural Landscape Foundation, 2018). Advancements in technology are changing the types of jobs available. In many countries and industries, the most popular

jobs did not present ten or even five years ago and according to one popular estimation, 65% of children starting primary school today will finally end up working in entirely new job types that are not present today (World Economic Forum, 2016). Widespread usage of computing is not the initial technology that is effective on actual job types. Since the steam engines to robotic welders and ATMs, technology has been taking place the human labour force but still forming new and higher-skill jobs. Within the last 30 years, the digital revolution has taken place many middle-skill jobs but still has generated mainly IT related new jobs (Aeppel, 2015; Cascio and Montealegre, 2016).

However, by 2011, a considerable gap shows up between two lines: economic growth and an increase in job creation. These show that technology advances are destroying the need for many types of jobs while it is improving productivity, fast advancements in technology have been eliminating jobs faster than it is creating them (Rotman, 2013). For instance, while digital platforms such as Uber, Air BNB are matching supply and demand in a high mutual benefit and low-cost way and providing owners the opportunity to evaluate their existing assets (e.g., their cars, their homes) as a supply, at the same time it replaces some properties (e.g., small hotels) and then destroying jobs availabilities in these properties. Recent improvements in technology are eliminating existing employees without creating new job opportunities. It seems that recent technological innovations create fewer jobs rather than previous industrial revolutions (Schwab, 2017).

Arise in e-business, expanding shapes of technology (e.g., computers, software, cloud computing) and enterprises' growing tendency to technology for ensuring greater efficiency make technology a significant event for almost any job in the tourism industry likewise in all other industries. Information technologies (IT) create changes in guest expectations; consequently, it is required for the tourism industry to re-shape its structure, required job skills, and job specifications in order to meet changing guest expectations. While the importance given to revenue management has been increasing day by day and also new positions have appeared for digital marketing management and e-commerce management in the tourism industry.

Within recent years, humankind has witnessed a significant advance in artificial intelligence, robotics, and service automation, whose utilization is seen in tourism and hospitality as well. They offer plenty of occasions that enables the industry players to develop their operational flows, productivity, and consistency in service delivered to the guests (Ivanov et al., 2017). The term artificial intelligence was first coined at the AI conference took place at Dortmount College in 1956 (Rifkin, 1996). Today, Elon Musk, the AI investor has described artificial intelligence (AI) as "summoning the demon" and has declared it the creation of a rival to human intelligence as probably the most serious facing the world during an interview at the Massachusetts Institute of Technology, in October 2014 (The Economist, 2015).

Developments in technology also change the ways of working as it enables a flexible work environment arrangement. The smartphone is one of the most current communication tools that are used as a pocket pc which offers calendar management, boundless access to the internet, telephone call, and e-mail correspondences whenever anyplace. This technology allows employees to work from home or away from the office (Demerouti et al., 2014). However, on the other hand, utilization of this electronic correspondence causes expansion of workday, to be reachable during off days and holidays for business purpose requirements. In the tourism industry, jobs are mainly forms of face to face interactions and physical job performing. Still, there are ways for remote jobs, especially in the sales and marketing part of the tourism industry. International and national chain tourism brands offer positions such as national sales managers who organize their customer correspondences (sales calls, telemarketing calls, etc.) and use their work offices in a flexible calendar; even, dining with a customer is counted as a sales activity for them. Travel consultants, car rental company representatives can assist customers in their service design inflexible workplaces within flexible hours.

In a nutshell, advances in technology have been influencing many jobs in many industries. While recent technological advancements and innovations support efficiency and improve work quality, it seems that it will create unemployment in some levels that will result in inequality in society. On the other hand, rapid developments in technology will require modifications in education systems in order to develop skills and/or learn new skills and approaches in order to meet new jobs' specifications.

2. LITERATURE REVIEW

Industrial revolutions are resulted from humanity's will to advance, evolve, and expand. In history, all industrial revolutions contributed to the tourism industry with the technological developments and inventions of its period.

According to Arnold Toynbee, who first used the phrase, the Industrial Revolution first occurred in Great Britain between 1750 and 1850 (Torun, 2003). Industrial Revolution is a process of shifting from an economy based on human and animal force to a production style dominated by machine manufacturing. In the first stage of the industrial revolution, the combination of steam, coal, and iron started "railway age." The introduction of locomotives instead of horses in front of wagons created a revolutionary change in railway operation. This revolutionary change in railway operation provided positive effects on the development of tourism. In 1825, the first passenger transport between the two cities took place. In 1840, 15 years later, the number of passengers was transported by rail during a 3-day general holiday (Easter holiday) between these two cities was 15,000. The fact that a large number of people could be moved in a short time from a city also began initiatives to organize public travel programs in 1841. Ten years later, in 1854, the passengers carried by railway in Great Britain reached 79 million. Considering that the total number of populations at that time was only 18 million, the number of passengers carried in a year is about 4.4 times the population of the country (Eralp 1983). The first

organized travel was first executed by a train with a steam power engine by Thomas Cook in 1841 (Mammadov, 2012) with 500 passengers (The Thomas Cook Group, 2018).

During the second industrial revolution occurred between 1870-1914, humankind witnessed innovations in communication, manufacturing, and transportation. These technological advances in transportation and its vehicles, expanding infrastructures, accelerated the development of tourism. Automobiles were included in to travel stage in the United States by the launch of Model T in 1908 by Henry Ford. Having a car was only privileged to wealthy people due to its high cost before Model T. The production on assembly lines brought down at costs considerably by mass production. This allowed to keep prices lower and made it affordable. Almost a quarter of a million model T automobiles per year were sold by 1914 (Mokyr, 1998). Today, travel by automobiles accounts for approximately 80 percent of all trips. Automobile travel also created motels and motor hotels as an accommodation type (Goeldner and Ritchie, 2011). The beginning of regularly scheduled air service was in Germany almost after 16 years (Goeldner and Ritchie, 2011), the powered, sustained and controlled first airplane flight accomplished by Wright Brothers at Kitty Hawk, North Carolina, in December 1903 (Crompton, 2007).

The third industrial revolution began right after World War II. It was the digital revolution that brought automated production, information communication technologies (ICTs), and the internet. ICTs and particularly the rising importance paid to the Internet in the tourism area radically changed the form of demand and supply applications in all parts of the industry (Schegg et al., 2013). Ever since the 1980s, ICTs precisely have been changing the ways of managing the business practices in the hospitality and tourism industries: the development of Computer Reservation Systems (CRS – 1970s), Global Distribution Systems (GDS – 1980s), and the arrival of the Internet (1990s) created generated actual changes in the operational management of the industry (Porter, 2001; Emmer et al., 2003; O'Connor and Murphy, 2004). Competitive advantage is an outcome that can be obtained thanks to the unique capabilities of an enterprise that differ from its competitors. IT ensures competitive advantage to tourism enterprises as it supports a decrease in costs, a rise in profits, proactive decision making, and differentiated services. For instance, Global Distribution Systems (GDS) delivers hotels' inventory to an expanded potential customer base by providing the possible adequate profitability (Nyheim and Connolly, 2011).

During the first industrial revolution, water and steam are used to mechanize production, electricity is used to constitute mass production during second and electronics and information technology are used to automate production during third. Today the fourth industrial revolution is in progress that established upon the third revolution and digital revolution that has been on stage since the middle of the last century. Industry 4.0 was first phrased at the Hannover Fair in 2011 (Schwab, 2017). Industry 4.0 has brought technologies that generate beneficial applications in the tourism industry, such as; autonomous robots, simulation, big data & analytics, cloud computing, augmented reality, cyber security, the industrial internet of things, horizontal and vertical systems integrations.

The tourism industry is a service-oriented industry where production and consumption are inseparable. Guests are getting more and more demanding each day and expect customized services. In order to create a tailor-made service experience for guests, industry professionals need to understand service management dynamics and the creative ways to marry them with high technology. In this way, they manage to compose the right experience by the delivery of the right information at the right time to the right people (Nyheim and Connolly, 2011). Human capital is the most critical asset in the tourism industry. Besides, labour issues are still a challenge for the industry as; labour force is one of the most significant cost items not only for salary payments but also costs resulting from high turnover, absenteeism, need for ongoing training, and compensations for service recoveries. Also, there is an ongoing decrease in the number of individuals' who desire to work in the tourism industry. So, it also necessitates the industry to focus on technology to create an alternative workforce to sustain adequate service flow (Nankervis, 1993).

Marketing hotels as IT innovative is not a long-term strategy. A long-term strategy needs to focus on the matter of seasonal employment and workforce use. Financial investment in service robot technology is worthy as an alternative to a lack of workforce as developing countries suffer from aging populations and low birthrates. Service robots may welcome guests at the hotel lobby, carry their baggage, make their check-in, and checkouts and guide them about hotel facilities (Kuo et al., 2017).

Regards to developments in technologies such as machine learning, artificial intelligence, and robotic mechanics, social robots are designed who interact and communicate with humans verbally and behaviorally. Social robots have considerable potential in reforming the tourism industry. Social robots are multilingual, less costly rather than individual staff (no breaks, no holidays, no complaints, no day-offs, no turnover, and nonstop working) and not in emotional conflicts with customers. Social robots have already adopted the tourism industry, such as a tour guide, museum guide, information centers, and service staff, etc. (Koo, 2017).

Organizational structure and administration are required to be redesigned in the existence of robotics services as employees are needed for skill training and the need for new staff recruitment in order to achieve success in distributing service by robots. Tourism education should develop new lectures and educational programs that consolidate different fields, for example, IT-related engineering, management, and user-friendly interface design. It is clearly foreseen that some current tourism professions will be displayed by robot services, but plenty of new jobs will be composed (Kuo et al., 2017). Hotels and airlines at first built self-service check-in kiosks and later, smartphone applications were created that offer faster check-in and making purchases available via smartphones. Cloud computing has started to be used at the back of the houses of hospitality enterprises in order to facilitate information transactions and sharing. Cloud computing allows international brands to work on shared systems with their head offices and sister enterprises.

In many tourism properties, artificial intelligence has already started to offer real service. In 2016, Hilton hotels introduced his robotic concierge, "Connie" that is designed by artificial intelligence. Connie can interact with guests about hotel facilities and offer recommendations. Connie can learn from each communication with guests and improve its future answers as it was designed by artificial intelligence (Ivanov et al., 2017). Hilton has recently launched its improved smartphone application that provides the guest with a personalized and customized remote control of his staying room (Hilton Hotels and Resorts 2017). In Aloft Hotels, a member of Starwood chain, robot butler called A.L.O Botlr, serve to its guests as a butler for some kind of room deliveries (e.g., towels, drinks, etc.). Its speed is at the same pace as the human walk. (TechCrunch, 2014). Aloft Hotels also offer in its some properties a voice-activated technology that allows setting lighting, to play music, and to remote Tv via an application. In Caesars Entertainment Las Vegas Resorts, concierge service is given by a virtual concierge called IVY, which welcomes guests at arrival and assist them for concierge services during their stay (Budget Travel, 2018). Henna Hotel in Japan offers its guests a stay experience in a hotel where many tasks (front desk operations, vacuum cleaning, in the room, assisting, luggage storage, luggage carrying, are carried by multilingual service robots (Henna Hotel 2017). Momentum Machines Company produces 360 gourmet burgers from scratch in an hour by a robot chef and serve to their guests. Kura Sushi Restaurant chain - 262 restaurants included in the chain - in Japan, offers the orders to the restaurant guests on a conveyor band. Guests are managing their orders via a self-order screen (Gözükeleş, 2016). By Industry 4.0, it is aimed to create smart factories in the manufacturing industry, how well it will make it possible to create smart hotels or adapted tourism services carried by service robots supported with artificial intelligence.

Current academic literature consists of studies regarding the impacts of technology in the tourism industry. Prior studies demonstrate that hotel technology practices enhance customer satisfaction, productivity and decrease costs that create competitive advantage (David et al., 1996; Siguaw and Enz, 1999; Emmer et al., 2003; Law and Jogaratnam 2005; Cobanoglu et al., 2011; Brachado et al., 2016). Buhalis et al. (1997) and Buhalis (1998), O'Connor and Murphy, (2004) focus on the information technology implementations in the tourism industry. Buhalis and Law (2008) offer an overview of internet applications to tourism. Ivanov et al., (2017), Kuo et al. (2017) and Geisler (2018) analyze the cost and benefits of service automation, artificial intelligence and use of robots in tourism industry while Pan et al., (2015), Murphy et al., (2017), Tung and Law (2017), Ivanov et al. (2018) and Tussyadiah and Park (2018) emphasize customers and robots interactions. Ivanov and Webster (2017) focus on designing a robot friendly hospitality facility and Murphy et al. (2017) examine the human appearance of service robots in tourism and hospitality and discuss its practices. Research up to now mainly has focused on describing the impact of technological innovations on service quality, on improving facilities' competitiveness, effectiveness, and efficiency, customers' adaptation to technological applications, and practices of the utilization of current technologies in the industry. Therefore, this study

investigates the potential impacts of current technological improvements on the labour structure of the tourism industry.

3. METHODOLOGY

The research was conducted using a face-to-face interview technique, which is one of the methods of qualitative research in order to examine the effect of Industry 4.0 on the employment structures of the tourism industry in detail. In this context, depth interviews were conducted with 17 managers from tourism operations using a "purposive sampling" technique. Because the study aimed to reach those people who had more extensive knowledge about Industry 4.0 and technological developments in tourism operations. In this study, five demographic questions and eight open-ended questions were asked to the participants. The interview questions were adopted by using scales and interview questions from researches (Çakıcı et al., 2017; DeCanio, 2016; Kaushik et al., 2015; Lam et al., 2007). Besides, semi-structured interviews were conducted by adding some questions that made the study original. The reason for conducting a semi-structured interview is that this technique allows the elaboration of the research by asking additional questions, although the questions are determined.

Interviews took between 35 and 45 minutes. This research was carried out in 2019, from February to July. Data obtained from face-to-face interviews were interpreted with "content analysis". Two independent researchers were selected to measure reliability and validity. These researchers determined codes, which were obtained from interviews and lists under the themes. Codes' and themes' frequencies and numbers that were found by researchers were compared between independent researchers' findings. Different findings have been resolved by consensus. The codes determined is listed as follow;

(1) Possibility of dehumanization
(2) Current job positions related to technology
(3) Future job opportunities related to technology
(4) Difficulty finding technology-compatible employees
(5) Employee adaptation of new technology
(6) Customer adaptation of new technology
(7) Robotics added values in tourism operations
(8) Future of robots and human

4. FINDINGS

Table 1 shows the demographic features of participants. Five demographic questions have been asked to the participants about the sex, age, education level, establishment type that they work and seniority.

Table 1. Demographic Features

		n
Gender	Woman	8
	Man	9
Age	20-30	2
	31-40	6
	41-50	7
	51-60	2
Education	High School Degree	1
	Associate Degree	2
	Bachelor Degree	11
	Master Degree	3
Establishment Type	City Hotel	11
	Resort Hotel	2
	Boutique Hotel	1
	Travel Agency	2
	Food and Beverage Establishment	1
Seniority	Hotel General Manager	2
	Sales and Marketing Director	1
	Sales and Marketing Manager	2
	Front Office Manager	2
	Food and Beverage Manager	1
	Learning and Development Manager	2
	Accounting Manager	1
	Guest Relation Manager	1
	Food and Beverage Branch Manager	1
	Travel Agency Owner/ General Manager	2
	Food and Beverage Assistant Manager	1
	Front Office Assistant Manager	1
City	İzmir	7
	İstanbul	4
	Ankara	2
	Muğla	2
	Antalya	2

When Table 1 is examined, it is observed that the gender of the participants is distributed regularly. The majority of the participants are between 41-50 years old, and this is followed by the age of 31-40. As the education levels are examined, it is seen that the highest ratio is a bachelor's degree. As seen in the table, there are differences in the types of tourism establishment. The reason why this diversity is chosen is to try to determine the changes in the tourism workforce overall due to technological developments. To accomplish this aim, interviews were conducted with managers of different hotel types, travel agencies, and food and beverage establishments. When the seniority of the participants is examined, it is seen that participants are working as managers in different departments. Different departments were preferred to achieve different perspectives. The most interviewed seniority

is the General Manager. Interviews were made with Hotel General Managers, Travel Agency General Managers, and Food and Beverage Branch Managers.

Table 2 shows the content analysis findings. The eight codes identified and the themes under codes are shown below. The percentages given in the table show what percentage of the sample of 17 people mentioned the same themes.

Table 2. Findings of Content Analysis

Codes and Themes		**n**	**%**
1.Possibility of dehumanization	Possible in specific fields	7	41,17
	Not possible	10	58,82
	Possible in technical fields	2	11,76
	Possible in the back office	3	17,64
	Not possible in management	1	5,882
	Depends on culture	1	5,882
	Will increase	2	11,76
	Depends on cost	2	11,76
	Depends on generation	1	5,882
2.Current job positions related to technology	No new job	6	35,29
	E-Commerce	2	11,76
	Online Sales	1	5,882
	Digital Marketing	3	17,64
	Research and Development	1	5,882
	Revenue Management	2	11,76
	Social Media Management	3	17,64
	Engineering	2	11,76
	Digital Training Manager	1	5,882
	Cultural Transformation Manager	1	5,882
	Digital Strategic Thinking Expert	1	5,882
	Online Channels Manager	1	5,882
3.1. Future jobs related to technology (disappear)	Reception	4	23,52
	Food and Beverage	3	17,64
	Kitchen	1	5,882
	Decrease in Travel Agencies' employees	1	5,882
	Concierge	2	11,76
	Room Service	1	5,882
	Ticketing	1	5,882
	Travel Agencies	1	5,882
3.2.Future jobs related to technology (appear)	Online employees	3	17,64
	Social Media Expert	2	11,76
	Digital Marketing	4	23,52
	E-Commerce Specialist	1	5,882
	Outsourcing Social Media Manager	1	5,882
	Distribution Specialist	2	11,76
	Sustainability Manager	1	5,882
	Experts (IT, Space, Medicine, Gastronomy, etc.)	3	17,64
	Research and Development	1	5,882
	Software Developer	2	11,76
	Channel Manager	1	5,882
	Digital Culinary Experience Expert	1	5,882
	Software and Information Security	1	5,882

Codes and Themes		n	%
4. Difficulty finding technology-compatible employees	Difficult to find	4	23,52
	Easy to find	9	52,94
	General labour problem	5	29,41
5.Employee adaptation of new technology	The new generation is adapted	3	17,64
	Can manage computer programs	1	5,882
	Provided with training	3	17,64
	Differentiation by country, culture, age, education level	2	11,76
	Middle/old ages are prejudiced	2	11,76
	Everyone has to adapt / necessary	3	17,64
	All generations are adapted	4	23,52
	Easy to adapt	1	5,882
	Excessive adaptation	1	5,882
	Opposition to the new	1	5,882
	Tendency of traditional	1	5,882
6.Customer adaptation of new technology	Differentiation by country, culture, age, education level	4	23,52
	Middle/old ages are not adapted	2	11,76
	New generation is adapted	5	29,41
	There will be harmony in the future	3	17,64
	Service is required to be taken from human	4	23,52
	Adaptation in pre-service process	1	5,882
	Western and Far East compatible	1	5,882
	Customers cannot be left alone with technology	1	5,882
	All generations are adapted	1	5,882
	Insufficient	1	5,882
	If it is user-friendly, they adapt	1	5,882
	Difficult to adapt to complicated programs	1	5,882
	Suitable for people who do not want to be in contact with people	1	5,882
7.Robotics added values in tourism operations	Speed	9	52,94
	Cheapness	1	5,882
	Less error / zero error	4	23,52
	Negative humanitarian behaviour disappears	3	17,64
	Long working	1	5,882
	Eliminating workers' rights	1	5,882
	Profitability	3	17,64
	Stability	1	5,882
	Standard service	3	17,64
	Ease of payment process	1	5,882
	Activeness	1	5,882
	Dynamism	1	5,882
	Saving time	2	11,76
	Feature update	1	5,882
	Eliminating labour shortages	1	5,882
	Reducing staff turnover	1	5,882
8.Future of robots and human	Use of robots will increase in city centre/business hotels	1	5,882
	Robots will be supportive	14	82,35
	Robots will replace specific tasks	8	47,05
	There will be no robot in F&B departments	1	5,882
	Robot usage will increase in Room division	4	23,52
	Manpower will be used in luxury / upscale facilities	1	5,882
	Frontline / operation will remain manpower	2	11,76
	Human and robot are interdependent	1	5,882
	People will control robots	2	11,76
	Manpower will remain in creative jobs	1	5,882

When the findings of the analysis are examined, it is found that an ultimate dehumanization is not seen as possible in the tourism sector. The reasons were explained by the labour-intensive feature of tourism, the lack of problem-solving ability, the inability to address the senses, and the lack of feedback of the machines. This finding is also supported by the possibility to use of machines in specific areas. F&B production areas, technical areas, back-office, and business hotels are considered more possible areas for dehumanization by participants. Also, some participants emphasized the need for the manpower at the management level. In addition to these findings, some participants mentioned that dehumanization is depended on culture, cost, and generations. According to their evaluations, dehumanization in the tourism sector is not suitable for Mediterranean countries, but it can be applied for North and Far East countries. It is also thought that older adults cannot adapt to dehumanization. Finally, some participants think that dehumanization practices will increase in the future.

The most frequent answer given about current job positions related to technology in tourism operations is "there is no new job related to technological development in the sector". However, with the technological developments, new departments such as e-commerce, online sales, digital marketing, research and development, social media management, engineering, digital training manager, digital strategic thinking expert, revenue management, cultural transformation manager and online channels manager have emerged in tourism operations.

In the questions regarding the changes expected to be experienced in future business structures, it was found that some departments will disappear, but some new jobs will appear in the tourism sector. Departments that will be eliminated in the tourism sector are evaluated as reception, food and beverage, kitchen, concierge, room service, and ticketing departments. Besides, it is found that the number of employees in travel agencies will be reduced and even the agencies will not be needed in the future. The participants listed the new departments that will emerge in the tourism sector as online employees, social media experts, digital marketing experts, e-commerce specialists, outsourcing social media managers, distribution specialists, sustainability managers, experts in information technology, gastronomy and medicine, research and development, software developer, channel managers, digital culinary experience experts and software and information security.

Another question asked to the participants is whether they have problems finding a workforce that adapts to the technology or not. The majority of the participants stated that they had no problems in finding employees who are adapting to the technology. These are because the new generation is keen on technology and that other generations adapt to technology with educations. Besides, some participants stated that finding a qualified labour force is now the general problem of tourism operations. Lastly, some managers mentioned that they had difficulty in finding a technology-compatible workforce.

Different answers were given to the questions about the adaptation of the employees to technology. While some of the participants stated that all generations are adapting to technology, others say that the new generation is more compatible. According to findings, middle or old ages are prejudiced to technology. The finding that adaptation was achieved through education was also mentioned. In addition to these findings of differentiation by country, culture, age, education level, employees can manage computer programs, easy adaptation, excessive adaptation, opposition to the new and tendency of traditional were also mentioned by managers. It is also stated that compliance with technology is a necessity for development and keeping up to date and facilitating the works.

Various answers were also reached in the questions regarding customer adaptation of new technology. The most common answer is that the new generation is adapted to technology. The findings of technology adaptation follow this answer varies according to countries, cultures, age, and level of education, services are desired to be taken by people, adaptation will increase in the future, and middle-aged or older people are more challenging to adapt. Few participants also made evaluations about there is adaptation in pre-service process, Western and Far East countries are compatible of adaptation, customers cannot be left alone with technology, all generations are adapted, there is insufficient adaptation if technological device is not user-friendly, customers adapt, difficult to adapt to complicated programs and suitable for people who do not want to be in contact with people.

In another question, the participants were asked how robotics provide value in ways humans cannot. The vast majority of the participants stated that speed is the essential value of the robots. This finding is followed by fewer errors or zero error possibilities of robots. It is also seen as a positive value that robots do not exhibit human-specific negative behaviours due to a lack of emotions. In addition to these findings, profitability, standard service, saving time, cheapness, long hours working, eliminating workers' rights, stability, ease of payment process, activeness, dynamism, featuring updates, and eliminating labour shortages were also found.

The last question posed in the research was to determine the position of people and robots in the workforce in the future. The vast majority of participants agreed that robots would be supportive of the manpower in the future. Also, it was found that robots will take over specific tasks. According to the evaluations, robots will perform the tasks in the back-office, kitchen, accounting, yield management, and reception. Also, it was found that the use of robots would increase, especially in the room division department and that the need for manpower would remain in the frontline and operation departments. Some of the participants mentioned that in the future, people would be in the tourism sector to control robots. The use of robots will increase in the city centre and business hotels; there will be no robot in F&B departments, the manpower will be used in luxury, and upscale facilities, humans and robots are interdependent, and the manpower will remain in creative jobs answers are also mentioned by participants.

5. CONCLUSION AND DISCUSSIONS

The tourism industry is a labour-intensive industry where the product is the service. Service is an intangible product, and the customer is present at the time of both production and consumption. Due to these characteristics of the tourism industry, services cannot be examined in advance, and that makes it difficult to achieve consistency in services. The tourism experience is intangible, meaning that the human element of the service makes the difference. In the tourism industry, almost everything depends on the labour force. Employees deal with the customers and represent the enterprises; they create and serve excellent products or drive the customers away. So, tourism industry managers regard their employee resources as their most valuable asset and competitive advantage. On the other side, employees are among the highest costs of tourism enterprises, and high turnover, absenteeism, and poor performance are frequent complaints among tourism managers. These concerns make the service automation and robots a feasible alternative to human employees in tourism enterprises. Moreover, it would be a mistake to ignore the technological advances and their possible contribution to the tourism industry.

It is foreseen that the capacity and power of AI systems will increase in the future and AI systems might take over some routine tasks. This could result a decrease in the given wages to these tasks and lead a shift in the labour supply over time (DeCanio, 2016). Depending on the results of this study, dehumanization is not possible in all service processes of the tourism industry as dehumanization brings more mechanical systems with a lack of emotions and senses. Dehumanization can be possible in F&B production areas, back offices, and technical areas where it facilitates the internal processes of the services. Ivanov et al. (2018) presented in their study the most customer appreciated hotel services delivered by robots are the services related to reception and housekeeping operations such carrying luggage, taking customer orders for new towels, linen, etc., concierge services such as providing information about the hotel and the destination, and processing cash and card payments. While relevant job positions disappear in these departments, new departments and job positions will be essential such as; software development, digital marketing, sustainability manager, software and information security experts, and digital culinary experience experts.

The results of this study indicate that demographic factors such as the generation that the customers belong to, countries that they live in, and their education level impact their adaptation towards machine interaction. Customers from Western and Far East countries are more inclined to use new technologies. The younger generation is more likely to adopt new technologies than the older generation and different customer segments can be more or less comfortable with machine interaction. This is consistent with the finding of a prior study performed in Portugal (Brachado et al., 2016). Thus, tourism industry managers should examine the degree of their customers' adaptability towards new technologies; a pilot scheme and demo presentations can help managers to understand how much their customers are willing to use new technologies. Therefore, customers are more likely to have a positive

attitude towards machine interaction if these technologies are more user-friendly, free of risk, adequate, easy to use, not complicated (Kaushik et al., 2015).

Besides, support may be given to the customers during their initial machine interactions in order to enhance their adaptation to machine interaction. Hence, tourism industry managers may need to encourage the adaptation of new technologies by making aware of their customers that the social support is available at every step they need and communicating new technologies' usefulness such as saving time, their similarities with the technologies that they are familiar to such as ATMs.

In terms of employee adaptation, the factors mentioned by participants affecting employee attitudes toward new technologies are their demographic characteristics as their nationality, age, and education level. New generations tend to use technology effectively and adapts quickly. These characteristics will enable them to operate more quickly and efficiently in working life (Çakıcı et al., 2017). Younger generations find the newest technological developments and possibilities as the opportunities that fulfil the requirements and serve the purpose. Therefore, they are more easily adapted to technological advances than older generations. Nevertheless, before installing a technological application, management and training support can be helpful in promoting employees' motivation towards technology acceptance and adaptation (Lam et al., 2007). Besides, as the new generation is keen on technology, it is foreseen that it will be more comfortable in the future to find qualified labour force prone to the latest technologies.

Today, the tourism industry is seen that specific processes are being managed by artificial intelligence and information technologies that are predicted to become much more stock soon. There are already new departments and positions that emerged in the industry due to the needs resulting from technological advances and changing trends such as e-commerce, online channel management, social media management, and digital marketing, cultural transformation manager, digital training manager, and digital strategic thinking expert. Depending on the results presented in this paper, it is foreseen that soon technological developments will lead to changes in task sharing with robots in the work environment. This task sharing may occur in two ways: substitution of tasks and complementary task sharing. The substitution of tasks is especially expected for the tasks carried at the back office, such as kitchen, accounting, yield management, and room division department. Frontline and operational tasks are expected to be carried in a collaborative work environment of humans and robots; robots will perform routine tasks at lower labour levels while the manpower undertakes top tasks more intellectually. Robots will be supportive of the manpower. Besides, participants commonly agree that collaboration between manpower and robots enables services to be rendered in a way offering perfect quality in standardized service, satisfying changing demands of customers, less service gap, time-saving, increase in profitability, less staff turnover, and labour shortages. Employees' motivation will increase when they realize and observe the benefits of implementing new technologies in their performance and guest satisfaction (Lam et al., 2007). However, managerial tasks will continue to be carried solely by

the manpower. The need for the manpower in the qualitative sense will increase because there will be a need for human intelligence to manage these robotic systems. On the other hand, the manpower at routine tasks may still come more valuable and be recognized as an upscale service, and luxury hotels may use all individual staff as a competitive advantage because technology can never substitute the warmth and personality of human interactions.

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KATKI ORANI / *CONTRIBUTION RATE*	**AÇIKLAMA / *EXPLANATION***	**KATKIDA BULUNANLAR / *CONTRIBUTORS***
Fikir veya Kavram / *Idea or Notion*	Araştırma hipotezini veya fikrini oluşturmak / *Form the research hypothesis or idea*	Asst. Prof. Simge KÖMÜRCÜ Lect. Selin İŞEVCAN ERTAMAY Prof. Mehmet Emre GÜLER
Tasarım / *Design*	Yöntemi, ölçeği ve deseni tasarlamak / *Designing method, scale and pattern*	Asst. Prof. Simge KÖMÜRCÜ Lect. Selin İŞEVCAN ERTAMAY Prof. Mehmet Emre GÜLER
Veri Toplama ve İşleme / *Data Collecting and Processing*	Verileri toplamak, düzenlenmek ve raporlamak / *Collecting, organizing and reporting data*	Asst. Prof. Simge KÖMÜRCÜ Lect. Selin İŞEVCAN ERTAMAY Prof. Mehmet Emre GÜLER
Tartışma ve Yorum / *Discussion and Interpretation*	Bulguların değerlendirilmesinde ve sonuçlandırılmasında sorumluluk almak / *Taking responsibility in evaluating and finalizing the findings*	Asst. Prof. Simge KÖMÜRCÜ Lect. Selin İŞEVCAN ERTAMAY Prof. Mehmet Emre GÜLER
Literatür Taraması / *Literature Review*	Çalışma için gerekli literatürü taramak / *Review the literature required for the study*	Asst. Prof. Simge KÖMÜRCÜ Lect. Selin İŞEVCAN ERTAMAY Prof. Mehmet Emre GÜLER

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