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DERLEME MAKALESİ

Revolution and Society 5.0: Japanese Human Centric Approach and Sectoral Changes

Devrim ve Toplum: 5.0: Japon İnsan Merkezli Yaklaşım ve Sektörel Değişimler

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Özet: Keidanren, Society 5.0'ın yoluna devam etmesi için toplumların birlikte çalışması gerektiğini vurguluyor. Toplum 5.0'ın temel amacı teknolojik gelişmeleri topluma entegre etmektir. Böylece teknolojiden korkan bir toplum yerine, teknoloji ve faydaları ile ticaret yapan bir toplum yaratılması hedeflenmektedir. Toplum 5.0'ın ilk olarak Endüstri 5.0 olarak tanıtılmamasının temel nedenlerinden biri, hızla gelişen teknolojinin sosyal yaşamla bütünleşmesidir. Bu makalenin ana hatları şu şekildedir; birinci bölümde giriş yapıldı ve makalenin ikinci bölümünde literatür taraması yapıldı. Bunu takiben üçüncü bölümde Endüstri 4.0'dan Toplum 5.0'a anlatılmış ve Toplum 5.0 uygulamalarına yer verilmiştir. Ve son olarak tartışma ve sonuç sunuyoruz

Abstract: Keidanren emphasizes that societies must work together in order for Society 5.0 to continue on its way. The main purpose of Society 5.0 is to integrate technological developments into society. Thus, instead of a community that fears technology, it is aimed to create a society that lives in business with technology and its benefits. One of the main reasons why Society 5.0 was not first introduced as Industry 5.0 is the integration of rapidly developing technology with social life. This article has an outline as following; at the first part introduction was given and at the second part of the article we introduced literature review. Following this, from Industry 4.0 to Society 5.0 was explained and Society 5.0 applications were given at the third part. And finally we present discussion and conclusion.

Introduction

In order to explain the term Society 5.0, it is necessary to examine the industrial revolutions. Until today; there have been 4 industrial revolutions that caused social, cultural and economic changes.

Industry 1.0: Mechanization - (1780-1870). It begins in the mid-1780s, after the emergence of water and steam powered mechanical production facilities.

Industry 2.0: Mass Production - (1870-1970). It started with the cheap steel production that Bessemer, who invented it in the 1870s, was of English origin. It is spread by electrical and chemical means. It continued with Edison in 1882 with the use of electricity in cities.

Industry 3.0: Automation - (1970-2010). After the Second World War, it emerged after programmable machines with the use of digital rapidly developing technology in production. The key component of this revolution is PLC programmable digital circuits. The third industrial revolution can be described as the informatics revolution in which computers and the internet are developing rapidly.

Industry 4.0: Smart Factories - (2011-?). Artificial intelligence factories have emerged with the acquisition of cyber-physiological systems in which physiological systems such as machine and robotics are controlled by automation systems equipped with machine learning algorithms. In the

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industry 1.0, 2.0 and 3.0 phases, manpower has an important place. When it comes to Industry 4.0, it is seen that human power has begun to lose its importance (BSTB, 2018a).

Those who think very organically differently, that who plan the future and while doing this, the human factor is not absent in the basic areas. Despite the superior technologies it produces, Japan, whose name is surprisingly not mentioned side by side with the Industry 4.0 revolution, was the partner country of CeBIT, one of the most comprehensive technology fairs in the world, held in Hannover, Germany in 2017. Promoting the philosophy of Society 5.0 (Society 5.0) at the fair, Japanese Prime Minister Shinzo Abe said, "Technology should be perceived by societies not as a threat, but as an aid." He said that they were based on his belief (Önday, 2021).

The invention of steam machines towards the end of the 18th century, the beginning of the use of electricity in production towards the end of the 19th century, the inclusion of electronic products and computers in the production processes in the middle of the 20th century, and finally, the internet of smart objects and objects (IOT) and human power remained in the background. After the industrial revolutions experienced by entering a period; today, by using different sequences of 0 and 1, every area of life from economy to construction, from law to computer has been able to manage with digital elements (TMMOB, 2019).

This transformation, which is called the fourth industrial revolution or digital transformation today, is especially in the fields of artificial intelligence, autonomous robots, wearable technologies, big data, advanced analytics, cloud computing, augmented and virtual reality, internet of things, additive manufacturing, next generation intelligent sensor technologies, autonomous vehicles and cyber security similarly through digital technologies; It has a direct influence in all areas of human life, from industry to agriculture, from banking to health, from transportation to public services. In fact, we have recently witnessed that deep learning and digitalization, even in social sciences and arts, have decided and produced some processes in our lives. With deep learning of an artificial intelligence developed by Sony Corporation, J.S. composing with a successful Bach style harmony is the best example of this (TMMOB).

Society 5.0; It aims to benefit from Industry 4.0 and the internet of things by considering the interests of society, and to produce new sustainable solutions in the protection of the environment and nature. In other words; not a technology against humans and nature, but technology used for society and nature.

While 170,000 people were working in 1998 in the film and photographic paper factory called KODAK, the company went bankrupt in a few years because there was no need to produce photographic paper and tens of thousands of employees remained unemployed. It is obvious that the rapid and fundamental changes brought about by the fourth industrial revolution will soon destroy a large part of traditional industrial and service methods. However, we should not be desperate here. There are no, new sectors and new business areas have developed, new job definitions have emerged instead of existing sectors, and individuals who can keep up with this change process have not been unemployed and have continued to work in new business areas. In fact, as in the case of KODAK, the digital photography sector emerged instead of analog photography when it was ending, and a much larger sector in terms of both application areas and preference and demand has created a wider range of business areas and new job descriptions (Salgues, 2018).

On the other hand, UBER, which is just software, is the largest taxi company in the world even though it does not even have a single automobile of its own and it is the most difficult solution in the USA in the legal issues that are not quite complex in seconds. It is known that unemployment among young lawyers is gradually increasing due to the program called “IBM Watson” which offers %90 accuracy (TMMOB).

It is inevitable that today's internal combustion motor automobile industry will collapse due to the introduction of electric cars and driverless vehicles, which are considered to be more

environmentally friendly for now, and the further development of autonomous vehicles will reduce insurance costs as a result of the reduction in traffic accidents, thus today's insurance methods will disappear, after the digital transformation in the industry. Industry 4.0 is among the inevitable situations that will put us before us. This change process; It brings the evolution of labor to other dimensions, the needs of capitalism to change, the reshaping of production relations from the beginning to the next, the change of job descriptions and fields of work, and necessitates the phenomenon of Society 5.0, which will be formed by trained individuals who will use this change correctly and direct it correctly (TMMOB).

Industry 4.0 came to our agenda with the concern that robots will replace humans and create employment problems. In fact, the ability of robots to work instead of manpower in jobs that strain people's muscle structure and pose a risk to occupational health and safety will undoubtedly enter our lives as a beneficial development. It is still possible for people to continue working on a business model where they will make more decisions, orientation, research, application and development, rather than losing their jobs during the production process, but only with the change of job descriptions and the emergence of new professions. (TMMOB).

When we start to talk about Industry 4.0, we make a mistake as if the human being was out of business and the developments started by themselves in accordance with the spirit of the time, independent of the human being. However, the human being is at the center of all this change and transformation. In this sense, the human being is both the creative subject and the object that is affected by the inventions he creates and redraws his direction. To summarize, we are changing and transforming as humanity. We develop this change and transformation by adding production, management and consumption (TMMOB).

Society 5.0; It aims to benefit from Industry 4.0 and the internet of things by considering the interests of the community, and to produce sustainable new solutions for the protection of the environment and nature. In other words; not a technology against man and nature, but technology used for the community and nature; it is aimed at a community that benefits, not fear of digital transformation (fear of employment) (TMMOB).

Well, what is the reason for us to change and transform so rapidly? Why is the current position not enough for us and we always strive to go one step further?

Change is a vital phenomenon that takes time. As people prepare for their lives, they always promise themselves that they will change and improve and strive to take steps in this direction. Moreover, we all know that change is necessary and we confess it to ourselves, even if we do not tell others; for this reason, as we have to keep up with change in the existing world, we also want to be decisive and lead change. This is the psychological side of change (TMMOB).

Mankind is a living being that has always managed to exist by changing and transforming itself since the day it existed. He has tried and is working on his way to cope with great burdens, not only by changing himself but also by transforming the world. In fact, if we say the last sentence that should be said at the end, we are changing ourselves and our ideas first and then the technology, production, social life, indeed the world, in order to cope with the difficulties in the same way today (TMMOB).

For example, Society 5.0, which the Japanese started to work on after Industry 4.0, is one of the best examples of this change and transformation. "What is the need for Society 5.0, which aims to digitalize the society and produce digital solutions to daily problems and disasters?" You may ask, "We are already dealing with problems somehow", you can express your opinion (Önday, 2021).

We are now in a time in which information spreads all over the world per second, speed is everything, and people are panicked and nervous in the slightest setback and delay. Waiting in a queue at the hospital, queuing at the bank or even at the checkout at the grocery store is a waste of time for us. We have a lot of work, time is limited, and we have more important things to

create. All of us are now concerned about spending more time for ourselves and our family. Therefore, we use whatever opportunity there is to save time. Perhaps we will soon pay for the products we buy from the market directly on our mobile phone without waiting at the checkout. In fact, this is already happening (TMMOB).

Indeed, robots have been partially present in human life for a long time. In addition to facilitating our lives, these have created new jobs and professions. In the near future, these robots / machines may not be or may be replaced by different operating systems.

Now imagine that a community of people, in which time is so narrow and everyone is in a hurry, is facing a major catastrophe. Many people will try to see the dimensions of the disaster they face in the city they live in, not by taking their head out of the window and looking outside, but through their mobile phones. In addition, people who are aware of a disaster on the other side of the world in a few minutes will seek an urgent solution to get rid of the situation they are in, and everyone acting on their own will cause great chaos in megacities. This chaos will cause greater losses than the disaster itself. Then this chaos needs to be prevented. The fastest way to prevent this chaos is to create a road map for each person according to the environment they are in and to direct them in the fastest way possible (TMMOB).

If we look from the perspective of labor and capital; the increase in efficiency, quality, speed and flexibility gained with digital transformation will reduce the need for workforce in the same business and production cycle. Of course, the exact equivalent of this is not an employment problem; It is necessary to raise the standards of the labor phenomenon and to evolve in favor of the employees instead of transferring only the added value that will arise to the shareholders. At this point, it is inevitable that today's union structures will also change in the upcoming period. The working class and the white collar, whose class is changing, must take a new position and the unions must make innovative efforts in this direction. According to the World Economic Forum (WEF) (2018), it is estimated that the social and economic value of digital transformation will be 100 trillion dollars in the 10-year period, and the total net economic benefit of digitalization together with other sectors will be 30 trillion dollars on average. It is estimated that the economic value to be created by the Internet of Things, which is one of the most fundamental technologies of digital transformation, will reach between 4 and 11 trillion dollars a year by 2025 (TMMOB).

The Japanese people, who are faced with great disasters, have noticed that directing people who have become largely digital in daily life is again through digital means. Hence, Society 5.0 was on its agenda. In short, Society 5.0 emerged due to human change and transformation. Although man and society appear to be passive in Society 5.0, the essential is the subject.

Especially, the most dangerous consequence of the digital transformation process of industry and production comes from the beginning of the issues to train qualified workforce who will design, manage and sustain this process and to make the educational infrastructure qualify to train this workforce. Along with digital transformation, changes in manufacturing processes will directly and indirectly require transformation in the workforce. Without making the educational infrastructure compatible with the digitalization process, it is not possible to train a workforce with the necessary competencies and to minimize the impact of digitalization on employment. As a matter of fact, when we look at the countries that have taken concrete steps in digital transformation, it is seen that the issues of reducing the negative effects of digitalization on employment and raising a suitable workforce come to the fore (TMMOB).

Many developed countries have prepared digital roadmaps by developing policies and strategies regarding digital transformation and new employment processes. After the middle of 2015, Industry 4.0 and digitalization started to be discussed in Turkey with an increasing momentum. Efforts are made in determining the policy and roadmap, albeit at the beginning, with the work that started with the public, private sector, NGOs, universities, technocities and private sector collaborations, especially the Ministry of Science, Industry and Technology (TMMOB).

Massachusetts Institute of Technology (MIT), one of the most successful technical universities in the USA, announced that it will establish an Artificial Intelligence University aiming to train experts who will develop information and artificial intelligence technologies in all kinds of sectors, with an average budget of $ 1 billion. With this investment, it is aimed that students learn how to use artificial intelligence and machine learning technologies in many different places in the form of history, health, chemistry and politics and meet the world's need for experts in this field. Establishing a digital transformation office in our country is of course a tangible development; Unless there is only a revolution in the education system (even if the fruits of this will be taken in the long run), Turkey misses this train, the brain drain continues increasingly, the Society 5.0 phenomenon cannot be settled, the external dependency increases, the social balance that is actually lacking in the society deteriorates more It is likely that the injustice and employment problem will reach worse levels, and all the gains brought by the Industry 4.0 revolution will be transferred to the capitalists. Hoping to meet in a more livable world where the Society 5.0 phenomenon has settled, where digital transformation has evolved for the benefit of societies and nature, where there is no employment problem, and where the gains of Industry 4.0 are fairly reflected on individuals.. (TMMOB).

1. Literature Review

Throughout human history, people have no chance to live in a predetermined system and all social life patterns are affected by the needs and conditions of that period (Canlıoğlu, 2008). Science has named and separated social structures with different characteristics created by the developments triggered by the use of knowledge based on historical consistency. In order to understand Society 5.0, or at least to see the various stages people went through before the fifth generation society, it is useful to briefly introduce the predefined social models and the historical features of these societies. Keidanren of the Japan Business Federation categorizes these societies from Hunter-Gatherer society to Super Intelligent Society (Keidanren, 2018). Society and its characteristics can be briefly explained as follows:

▪ Society 1.0 (Hunter-Gatherer Society): With the emergence of humans, humans began to use knowledge to dominate nature for survival. At that time, many methods were developed to protect against nutrition and external threats (natural disasters, wild animals, etc.), these methods were the main motivation and made the species sustainable. In the fight against nature, it is the lack of equipment that enables the first humans to pass nature and enable people to develop advanced civilizations in the following years (Sezer, 2018).

▪ Society 2.0 (Agricultural Society): Under the primitive living conditions of the agricultural society, humans domesticated the plant species after hunting and gathering; It is a social structure that learns to benefit from sunlight, water and soil and learns the transition to settled life. (Canlıoğlu, 2008). Historically, people started to settle in British Columbia. How long did the "Industrial Revolution" last in the middle of the 18th century. In this process, the world population increased, the villages and cities we know today were established, and relations with society, culture and economic life began to take shape. Continuous improvement has been achieved with the use of knowledge and finally it has ceased to be machine-centered from agriculture-centered.

▪ Society 3.0 (Industrial Society): The change brought about by the "Age of Enlightenment" was the liberation movement led by the bourgeoisie and came about because of the rejection of the totalitarian government, the feudal structure, and the oppressive academic worldview because of the European Renaissance and the Reform Movement. According to Freyer (1954), the Industrial Revolution began in the weaving industry in the mid-1960s, and in the same year James Watt gave its final form to the steam engine. The weaving wave is followed by the steel wave (1800), the transport wave (1825), the chemical age (1850), the electrical industry wave (1900) and the gasoline engine age (1900) (Freyer, 1954).

▪ Society 4.0 (Information Society): With the development of the industrial revolution, the industrial society realized that mechanization made life easier, and people focused on more

sensitive issues, so they studied them further. With the rapid spread of information technology in the second half of the twentieth century, concepts such as information production, information sharing, information acquisition and information marketing became more and more important. In this new society that feeds on knowledge, knowledge has become the most important commodity in all areas of life. Uçkun et al. (2002) defined the concept of information society as "a society that produces various information, connects to information networks, reaches ready-made information, can easily disseminate the accessed information, and use information in various departments" (Uçkun, ve Latif, 2002). Due to the development of information technology in the information society, international exchanges have become stronger, knowledge has become a global strategic commodity, the phenomenon of "lifelong education" has emerged, and the value of brain power and qualified individuals has continued to increase. At the same time, the concepts of mass production and consumption, standardization, popularization and centralization brought by the industrial society have been replaced by concepts such as individualization, differentiation, localization, and questioning.

The concept of "Society 5.0" was first introduced by the Japanese government to implement the "Smart Society" project as the 5th Master of Science and Technology Plan. Even though it may seem utopian, “Society 5.0” makes the world of physics, including social life, perfect and highly effective It is a concept that reflects a status that simultaneously integrates with networks. "Future Investment Strategy: Society With the program titled "Implementing 5.0", it thinks that it will find solutions to its demographic and socio-economic problems with the economic growth it will achieve in the medium and long term (Waldenberger, 2018). Japanese government, with the goal of "Society 5.0", such as sensor, robot, big data and cloud computing It wants to increase the quality of life and accelerate sustainable economic development by integrating new technologies with the society (Lobe, 2017).

Japan, against Germany's "Industry 4.0" concept, by broadening the digitalization process to cover all areas of life, "Society 5.0" It introduces its visionary project, which it defines as, on a global scale at every opportunity. For example, Japanese Prime Minister Shinzō Abe is in Hannover, Germany, he had the opportunity to introduce the "Community 5.0" project at the 2017 CeBIT Fair. In his speech, Abe emphasized the limited area and resources of both countries. Underlining that, thanks to innovation, it has been able to achieve growth mainly through SMEs rather than large companies. He proposed the expansion of mutual cooperation with Germany. Thereupon, German chancellor Angela Merkel gladly accepted this job offer. He stated that they can benefit from robots especially in the field of elderly care. Both countries adopt the principles of "Community 5.0" within the framework of cooperation. technological sustainability, inclusion (integration) and transparency (Kroker, 2017).

The design of "Society 5.0" includes an extensive character. Consisting of unlimited digitalization and independent networks beyond industrial relations It reflects a social transformation process. The necessity of digitalization and the creation of networks, not only in terms of technological possibilities, but often Response to current chronic socio-economic problems such as aging, depopulation, productivity, efficiency, energy, regional development and disaster management It is also discussed in terms of finding. The moves towards the realization of "Society 5.0" are at the same time Japan's economic and social institutions. With its global dimension, Japan wants to maintain and develop its pioneering position in certain technological fields and sectors in the world, such as the production of artificial intelligence robots, as well as information technologies related to sensor technology, which enables the integration of virtual and physical data (Waldenberger, 2018).

"Society 5.0" not only makes new information obtained from information societies available to people, but goes beyond this. It will also share with robots with artificial intelligence. Artificial intelligence technological entities and people are also outside of the economy / work area, that is, social life will be able to obtain information in every frame and will be in mutual information sharing and cooperation. The scope and extent of the digitalization of information will extend to

all areas, from legal and social systems. In short, the digitalization and transformation process will progress continuously and rapidly in all areas (Andreae, 2018).

Wang, Yuan, Yong, Wang, Xiao, and Qin (2018) and Wang, Li, Yuan, Ye, and Wang (2016) pointed out that the concept of society 5.0 appeared in Japan in 2015 (Abreu, 2018) National Political Initiative (Abreu, 2018) Keidanren, 2016; Harayama, 2017; Research and Development Strategy Center: Japan Science and Technology Agency, 2017). Forahn and Arman (2017) and Costa (2018), to some extent, Society 5.0 follows Industry 4.0. Although Industry 4.0 focuses on production, Society 5.0 tries to place human beings at the center of innovation. It also uses the impact of technology and the results of Industry 4.0 to improve quality of life, social responsibility and sustainability by deepening technology integration (i-SCOOP, n/d, Serpanos, 2018).

According to Hayashi et al. (2017), with Society 5.0, Japan seeks

[…] [to] create new values by collaborating and cooperating with several different systems, and plans standardization of data formats, models, system architecture, etc. and development of necessary human resources. In addition, it is expected that enhancements of intellectual properties development, international standardization, IoT system construction technologies, big data analysis technologies, artificial intelligence technologies and so on encourage Japan's competitiveness in “super smart society” (p. 264).

Keidanren (Japan Business Federation) (2016) presents, as purposes of Society 5.0,

Every individual including elderly people and women can live safe and secured comfortable and healthy life and each and every individual can realize his/her desired lifestyle. […] Improvement of productivity through digitization and reform of business models are promoted, and at the same time, the new economy and society will be realized by promoting innovation and globalization. […] Efforts are made to solve a pile of issues of our country such as falling population, super aging society and natural disasters so that rich and vigorous future will be realized. Through overseas expansion of new businesses and services, we can contribute to solving global scale issues as well (p. 10).

According to Serpanos (2018), there are many challenges, such as ``software integration and upgrades, network interoperability, synchronization according to real-time processes and applications, and, importantly, security" (p 72). As maintained by Wang et al. (2018): "The basic theory of social 5.0 researches is parallel intelligence, which is a novel method that extends the traditional artificial intelligence theory to the emerging cyber-physical social system (CPSS)" (page 6).

To this end, "Develop a national strategy and integrate the government promotion system" "Enact laws to implement advanced technology", "formation of the knowledge base", "dynamic participation of all citizens in the new economy and society" and " advanced technology and society" are of paramount importance (Keidanren (Japan Business Federation, 2016).

Therefore, the ultimate goal of Society 5.0 is to improve people's quality of life by mobilizing the production and technological potential of Industry 4.0 (Harayama, 2017). As the ultimate, to some extent inevitable goal, Society 5.0 “commits to revolutionize the society as we know it, and to improve our lifestyle and community life in our personal and professional lives” (Costa, 2018).

According to the Research and Development Strategy Center: Japan Science and Technology Agency (2017), with the advancement and continuous development of information technology, individuals and society will have huge room for development. Opportunities for innovation, growth and prosperity based on collaboration, co-creation and human-computer interaction. However, the center draws attention to the fact that this development will bring ethical, legal and social challenges, as well as security and privacy challenges, which must be maintained.

In summary, the main idea of society 5.0 is to integrate the digital environment with the physical environment to overcome social problems and as a result, people to improve the quality of life.

Although this paradigm feeds on humanism, it is stated that it has some problematic aspects and risks (Nurillin, 2019). For example, the emergence of new addiction types such as internet, online video games, smart phone addictions (Gladden, 2019; Takahashi, 2018); Difficulties in information security and protection of personal privacy, rapid spread of fake news are among these risks (Shiroishi et al., 2019). It is also discussed that in different environments, unemployment rates will rise with industry 4.0 and Society 5.0. However, it is also stated that people will continue to be involved in control and monitoring in this society structure where new business and professions will arise by different circles or where the cooperation of humans and robots is at the highest level (Gökten, 2018).

2. Sectors in terms of Society 5.0

2.1 Marketing 5.0

Marketing is on the verge of a new era after the stages of Marketing 1.0 (product centered), Marketing 2.0 (consumer centered), Marketing 3.0 (people centered) and Marketing 4.0 (digital marketing) in its development time: Marketing 5.0. In other words, “Internet of Things Marketing”. The Internet of Things (IoT) refers to the network platform where objects can be connected to each other and to digital environments with internet-based technologies. It is foreseen that the internet of things, which is the technology of the near future, will make all objects smart and connect them to each other and people with tools such as RFID, NFC, sensors and biochip. Thus, dozens of elements such as smart homes, roads, fields, cities and artificial intelligence production and marketing processes will surround the lives of the future. Elements such as 3D printers and artificial intelligence robots, which are manifestations of IoT, facilitate the democratization of production processes.

The purpose of this section is to reveal what kind of changes the Internet of Things will cause in terms of marketing activities. In this context, these changes were tried to be determined by making comprehensive analyzes of the IoT-oriented studies that were previously made in terms of marketing activities. In this context, Marketing 5.0 will enable the customer to be included in the marketing process with the democratization of production. Again, the extraordinary speed of the net, efficient use of big data by companies, and dozens of interconnected objects and platforms will enable marketing to be as personalized and real-time as possible for consumers. However, the cost of accessing information and energy has become very cheap with information and communication technologies. This means that extraordinary marketing costs approach zero. In addition, Marketing 5.0 facilitates more effective marketing research with instant and detailed data from artificial intelligence objects. It also ensures that the marketing communication elements are integrated both with each other and with digital marketing channels in the form of social media, thus making presentations that add value to the customer. In the meantime, it can be said that IoT will facilitate more sustainable marketing efforts with the increase of green electricity and shared use of resources. Finally, with the IoT, the marketing mix elements can be managed more intelligently by companies, in short, they can be arranged in a human-centered manner that adds value to the customer and only for him.

The feudal agricultural period of the middle Ages left its place to a new paradigm, the "Industrial Age", with the production of the first coal-fired steam engine after the printing press. Right after this period, the "Information Age", in which reason, information and rapidly developing technology formed its capital, and which was active until the 2000s, formed the dominant paradigm. Today, however, technology is used in smart robots, artificial intelligence, augmented reality, etc. It can be said that a very large dimension has been gained and great collaborations have been formed in every field, and there has been a digital end times. We can divide the "Digital Age" into two phases: the first phase is the "computer revolution", which came into widespread use in the 1980s and radically changed the way of doing business, all relationships and communication in all areas of life. The second phase is the burgeoning "Internet of Things" (IoT) revolution, which promises to connect all physical and digital objects and devices (Greengard,

2017). The concept of "Internet of Things", which was used for the first time in 1999 by Kevin Ashton during a presentation at P&G company, includes sensors, chips, etc. It refers to the communication of physiological objects used daily, in which technologies are integrated, with each other and with people. Thus, it is expected that it will provide a much larger digital transformation than the internet and computer (Ashton, 2009).

Internet of Things (IoT) uses sensors, embedded devices, internet, bluetooth, QR codes, etc. It offers an infrastructure that will radically change both the production and consumption structure. The increase in the use of robots, 3D printers, artificial intelligence and machine learning in production, thus very important advances in quality increase and cost reduction, tracking the products within a supply chain from the raw material stage to the customer by using sensors and RFID methods. These are just a few examples of the added value it creates. Likewise, the fact that IoT takes the producer-consumer or retailer-customer relationship to a completely different dimension shows that it can radically shake the basic economic paradigm. For example, sensors covering the entire environment of consumers will be able to transmit all shopping data about them to retailers, so businesses can offer real-time, personal discounts and offers to consumers. Another inspiring example of the IoT revolutionizing the way business is done is 3D printing. Although these printers, which allow the production of three-dimensional objects, are mostly used for prototyping for now, in the very near future, they will allow the final consumers to produce the product they want themselves as "producer-consumer" without the need for any manufacturer.

Marketing means that the business introduces itself and its products to all its stakeholders and delivers the goods and services it produces to its customers through appropriate channels and presentations. In this context, marketing can be defined as “the process of creating value for customers and building strong buyer-person relationships by acquiring value on behalf of the business” (Kotler and Armstrong, 2016). Marketing moneymaker is in a close relationship with the production process and has developed in parallel. As a matter of fact, in order to make everything an object that can be bought and sold, it is necessary to introduce, desire and sell them to the end user, who will be called the consumer, as well as the stages that the objects undergo as production commodities. This gave rise to the term marketing. For example, Rifkin (2015) states that the "invisible hand" in Adam Smith's assumption that the supply and demand in the market will be balanced in the most efficient place with the help of an invisible hand without any outside intervention, is advertising (marketing) that succeeds in increasing demand in parallel with the increasing supply. As a matter of fact, although marketing has evolved in the era of digital technology, which is the most extreme point of information and changing technology, it has not broken its close relationship with the dominant paradigm.

Internet of Things technology is in the interest of more engineers and programmers today. In this context, it can be said that the past is similar to web technology. Because the web was once seen only as a technical tool, but today it is seen as a tremendous social platform (Kalafatoğlu, 2014). Likewise, in the near future, IoT will be seen as a very important ecosystem that connects everything, everyone, everywhere and anytime, beyond just creating a paradigm shift in the field of marketing. The aim of this section is to examine the relationship of the term IoT with marketing, which is not studied much especially in Turkey, but is discussed over the fields of engineering, architectural design and programming in the studies examined. In this context, it can easily be said that marketing has entered a new phase, which we call "Marketing 5.0", in the light of the information obtained during the department process.

2.2 From Marketing 1.0 to Marketing 5.0

Marketing has passed through three main phases over the years. These are: “product-centered” Marketing 1.0, “consumer-centered” Marketing 2.0, and “people-centered” Marketing 3.0. The Marketing 1.0 phase refers to an understanding that started with the industrial revolution and partially exists today, where businesses have made large-scale production and presented their products to people in a mass, standard and undifferentiated form. In this understanding, consumer

requests are ignored and product and sales centered actions are taken. For example, Henry Ford, the owner of Ford, which produces only black cars, sums up this understanding: Marketing 2.0 is a process brought about by the information age. It gained importance in the 1980s and today represents one of the mainstream approaches. At this stage, there are quite a few vendor alternatives and the products are easily sold for cheapness, quality, etc. Customers who have the power of comparison in all aspects are seen as kings by the sellers and all requests and demands are taken into account in order to sell their products. In Marketing 3.0, on the other hand, the person is not viewed as a mere buyer, but as a "human", and a value-centered relationship understanding is developed by businesses beyond selling products. Marketing 3.0 still plays a dominant role in gaining competitive advantage today. As a matter of fact, businesses that see consumers as human beings, touch their minds, hearts and souls, take into account their concerns and fears about society and nature, and satisfy them emotionally, in short, whose goal is to make the world a better place, are appreciated and gain competitive advantage (Kotler, 2008). et al., 2014).

Businesses that have a competitive advantage are appreciated and gain competitive advantage (Kotler, et al., 2014). Today, Marketing 4.0 rises on a "digital-centered" approach together with the people-oriented approach of Marketing 3.0. Because Marketing 4.0 refers to the deepening and expansion of human-centered marketing, which covers every moment of the buyer's journey (Kotler, et al., 2017). Indeed, Kotler et al. (2014) what they call “new wave technology”; They described the new digital technology consisting of cheap computers and mobile phones, low-cost web and open source as the main driver/driver of Marketing 3.0. In this context, Marketing 4.0 (digital marketing); It is the use of internet, e-mail, mobile and other online and interactive platforms in order to support and promote their brands and businesses with methods away from traditional media such as TV, radio and magazines (Çözen, 2011). Jara, et al. (2012) in their definition without separating digital and IoT, they say that Marketing 4.0 will continue to focus on the needs and wants that Marketing 1.0 and 2.0 focus on, and that Marketing 3.0 will continue to satisfy their core values such as desires, concerns and creativity. They also state that in addition to these, Marketing 4.0 will enable people to actively participate in existing online platforms (for example, social media channels) and to have a direct interaction with the product and brand. Indeed, all this makes it easier for people to monitor core values and social movements and businesses' contribution to them.

Marketing 5.0, briefly Internet of Things (IoT) Marketing, is a new definition that was first introduced in this study. Marketing 5.0 is not a completely new paradigm, but rather a more advanced version of Marketing 4.0, including the first three marketing phases. Although Internet of Things marketing is similar to digital marketing, there is a fundamental difference. As a matter of fact, Marketing 1.0, Marketing 2.0 and Marketing 3.0 express the traditional side of marketing and are more related to the physiological world, while Marketing 4.0 is related to the digital dimension of marketing (Kotler, et al. 2017). Marketing 5.0 means sensors etc. It enables the receivers to be integrated and to make these objects smart and feel, allowing them to communicate with digital devices and technologies, and transforms into a bridge platform that connects the physical and the digital. While digital marketing combines media such as computers, tablets and artificial intelligence phones and provides customer communication through multi-screen experiences and platforms such as social media, e-mail and mobile applications, IoT marketing is more targeted with information obtained from all objects and devices surrounding people. , can offer personalized, low cost and effective offers and provide closer customer communication.

2.3 Internet of Things Marketing

Conceptualized for the first time, Internet of Things Marketing (Marketing 5.0) actually expresses not a disconnected understanding from all other marketing phases, but rather a new and powerful form of connection marketing where the product, customer, human being and digital are still in the center but converge as never before. In Marketing 5.0, the focus is still on the customer as

"human", while products are presented to people through a huge information network established by the digital and physical world (Kotler, et al., 2014).

2.3.1 Internet of Things and Smart Marketing Mix

Internet of Things (IoT) technology will make it easier for elements of the marketing mix (4P) to be smarter and more integrated. The Internet of Things enables the emergence of artificial intelligence products that can provide information about itself and its environment. For example, Fitbit wristbands can transfer many important information such as food consumption, calorie expenditure, sleep patterns, etc. IoT-based technologies such as QR codes or RFID can track how well the products are received from the raw material stage until they are presented to them. For example, labeling and recording the fish caught with these technologies may allow questioning where they come from, thus preventing illegal, prohibited time fishing (Sarnı, et al, 2016).

It provides the opportunity to make dynamic pricing with the digital labels it uses on the IoT store shelves, making it easier to increase sales and to melt the products that are out of expiry time or that have excess stock. IoT can also facilitate the emergence of usage-based pricing patterns. For example, any white goods brand can give people free of charge instead of selling a washing machine, allowing them to pay for the hour they use it alone. It can measure the amount of usage through artificial intelligence sensors on the washing machine and a robust IoT infrastructure (Rosemann, 2013). This usage-based, elastic consumption understanding will seriously change the future consumer market and way of doing business. Today, the pay-as-you-go method is used by insurance and vehicle rental companies and aircraft engine manufacturers (Greengard, 2017).

It can be said that marketing communication will change radically with the IoT. From now on, marketing campaigns will be shaped according to valid data, predictable behaviors and known habits, not vague hypotheses and predictions. This means that the business gets rid of ineffective and expensive promotional activities. For example, John Wanamaker once said, "Half of the money I spent on advertising was wasted, but the thing is, I don't know which half it is" will probably lose its validity with IoT. Because IoT enables better analysis of consumer behavior and more valuable offers to them. In short, efficient advertising campaigns will save most, if not all, of the money spent on advertising. Now, instead of advertisements for everyone on TV or annoying internet-based banner and pop-up advertisements on TV, promotions and recommendations that are not disturbing and misleading, that are organized according to the data collected from people, that are relevant and add value, will be presented to the consumer (Bayuk and Öz, 2017) .

The Internet of Things has enabled the focus of marketing to shift from product to service and then to "customer experience". This shows that companies focused on selling products have moved to relationship-centered service models, and moreover, they need to offer important experiences to the customer at every touch point where they are engaged today. Today, consumers see shopping as a whole process, desire to participate actively in all stages of the pre-purchase, purchase and post-purchase process, and want this process to be a pleasurable and entertaining experience. This forces businesses to add features such as entertainment, participation and interaction to the shopping process. In this context, "customer experience" can be known as all of the valuable outputs that can be divided into two as physiological and emotional based on the participation of customers, considered as the whole of the pleasant memories and emotions of the customers, which cannot be easily reflected by other businesses, and which emerge at the points of contact with the customer (Duran, 2016). For example, according to a study conducted by McKinsey, customer experience will surpass product and price factors, which are the reasons why people prefer a brand, by 2020. It is also stated that 86% of consumers will be ready to pay more money to increase their experience, and 89% of customers prefer competing brands because of the bad customer experience they encounter.

The most important reason why businesses make "customer experience" their main strategy is that there is a positive relationship between Customer Experience and Customer Loyalty,

Customer Happiness and Sales, as many studies show (Kalit, 2017). It can be said that IoT marketing combines physiological and digital customer experience. In other words, it offers experience, pleasure and satisfaction in a related and integrated way not only in physical environments but also in digital environments.

2.3.2 Contextual Marketing

The term contextual marketing refers to personalization and real-time presentations. In other words, with this understanding, businesses will be able to offer personalized product and service offers over IoT-connected devices and objects, while doing this in real-time and in accordance with the shopping environment (contextual). For this, companies learn the past purchasing habits of consumers with IoT-connected devices and objects, they can see their shopping behavior on the internet with cookies, and they can also follow their consumption patterns and desires through social media. Thus, they make personalized real-time offers. For example, Starbucks has listed the past orders of its customers in its stores in the USA based on availability and weather conditions, and examined which products its customers have purchased at which locations, in which time period and weather conditions. In this way, it understood the preferences of each of its customers in different conditions and offered them personalized offers for different situations. For example, when he approached the branch, his customer, who usually orders filter coffee on his way to work in the morning, asked if he wanted filter coffee to be prepared via the application. If the buyer demands iced coffee on sunny days, he offered iced coffee on sunny days. Customers who accepted the offers were prepared without going to the branch, so they could make their payments via the application and received their coffee from the branches without waiting in line. Starbucks, which conveys 10 million personalized offers per week through this application, has increased its earnings rate by 66% compared to in-store offers and by 25% compared to personalized offers made via e-mail (Kantarcı, et al., 2017). Today, for a product consumed online or virtually, companies add product updates and offer up-to-date, quality content to customers. The same is now true for tangible products. For example, electric car manufacturers add new features and functions to their cars that are already on the road by sending software updates with the IoT connected technologies they use (Odusote, et al. 2016). In yet another personalization example, the touch screen bottle of the Absolut Vodka brand can activate the wi-fi connection and show the location of the bottle, the time, the weather, how cold the bottle will be or what kind of cocktail recipes will be suitable (Fiandaca, 2016).

Now, new generation customers expect more personal and pro-active interaction from businesses. This gives rise to the term interactive marketing. In other words, the consumer wants to be a part of the good or service he will use and to be able to change what is inside. Or, if he can't change it himself, he at least wants the business to offer customized content unique to him and take a proactive stance. In this context, the consent of the customer for marketing activities, known as authorized marketing, will come to an end, and when the buyer feels that only special and related presentations are made to him, this turns into an experience that adds value to him and increases his happiness, he will actually want to interact with the business. For example, businesses today offer open software applications to users, giving them the opportunity to organize and customize the content according to their wishes.

While the basic economic values set on the argument that the product line is wide and product variety is good, today people are faced with what can be called the abundance paradox. In other words, for the consumer, it does not mean the chance to choose more product options and the pleasure of finding the exact product. Today, this assumption has evolved into what we can call “oppression of choice”. For the consumer, more choice means more complexity and choice difficulties. Findings in a long-running study by a group of psychologists showed that increasing the amount of choice increased people's anxiety, confusion, and inability to make choices. For example, related researchers distributed shopping coupons to a group of customers in a market and told them to buy jam with them. Some of the customers were directed to the shelf with only 6 different jams, while the other part was directed to the shelf with 24 different jams. As a result,

one-third of the customers (33%) who encountered a lower number of choices purchased jam, while only 3% of the customers who encountered more choices made a purchase. In addition, in a similar study, customers who encountered more options said that they were less satisfied and unhappy (Kambies, et al. 2016). However, with the connected applications and easy provision of big data provided by IoT, i.e. buyer location, advanced analytics, artificial intelligence, etc. With the data to be obtained from the applications, appropriate and personalized goods and services will be offered to the customers in retail and online stores, and a customer experience will be provided. In this context, it can be said that the IoT-centered marketing approach will save the customer from the oppression of choices.

2.3.3 Omni-Channel Strategy (Full Channel)

The customer experience is the sum of the perceptions and feelings of the customers as a result of the relationships you have established with them at all touch points you touch. Customer Experience Management is; it refers to the transition from managing business processes to managing the "emotion" in these processes (Kalit, 2017). To manage this emotion, all touch points need to be coordinated and integrated to deliver a single experience. In this context, the "Omni Channel" strategy, which is defined as a form of marketing (Acar, 2015) that includes channels such as stores, internet, call centers, mobile and social networks, and where the customer has the same experience in all channels, is important. Omni Channel, which also means "single user experience", promises users a single experience on all platforms regardless of the channel. With this method, customers experience the same experience in all channels from retail to invitation center (Şit, 2013). The new connected world has caused the consumer to change as well. Now people; They want to connect with brands from anywhere at any time, access goods and services and information about them from any channel, interact with brands and other customers from all channels, and make the least effort for all these.

In a single channel, the buyer communicates with the brand through a single channel, while in multi-channel, the buyer communicates with the brand through different types of independent channels. Although cross-channel is similar to omni-channel in that the brand perceives the customer as a single user, the channels act independently in terms of doing business in the cross-channel. In Omni-channel, on the other hand, a brand with its entire identity appears before the customer, not channels of different nature. Likewise, the brand sees the customer as a single buyer, both strategically and operationally, and offers acquisitions and offers that complement each other from different channels (Kantarcı, et al., 2017). In this context, the process of providing a consistent and single experience across all channels becomes easier, faster and more efficient with continuous and instantaneous data about customers coming through IoT devices, and it ensures that all customer relations are carried out in a more predictable manner.

2.3.4 Augmented Reality and IoT

Augmented or virtual reality concepts have met with consumers through wearable technologies such as wristbands and glasses. For example, Toyota's interactive showroom application allows users who are at the start of devices such as computers or tablets to connect with the sales representative in the store by wearing virtual reality glasses. The user can examine the desired vehicle from the sales representative's point of view, the vehicle's features and equipment options. In the process, users can ask all the questions in their minds and direct the attendant to the department they want, with voice speaking. It can also receive data about prices and campaigns at the same time. Today, some virtual reality glasses can not only see the menu of the restaurant you are passing by, but also project a photo or video onto any paper. Situations like these provide customers with a unique acquisition.

2.4 Internet of Things and Retail Stores

The Internet of Things shows that physiological stores will also experience large-scale changes. This is both in store-customer relations and in store design, stock management, etc. clearly visible

in the fields. It is possible to summarize this transformation as follows: Intelligent digital signs and screens: Artificial intelligence called “Beacon” and content have been made fragile; Small Bluetooth radio transmitters that offer personalized experiences are a widely used IoT technology in retail today. It is used in areas such as monitoring, interaction, security and analysis, especially in stores. Businesses can use "beacon" to detect face recognition, time spent around the shelf or product, etc. can carry out activities. For example, Beacons that create a broadcast with their own identity and scan the customer's information when the buyer enters a store, first send the "welcome" message to the application installed on the customer's phone, then scan their past shopping experiences and send a new message to the customer with the name of "special offers". Notification can be sent. When the customer evaluates the special offer and heads towards the relevant store section, a second beacon can sense his arrival and share relevant details such as product pricing, popular products and targeted offerings. Again, discount coupons, complementary products, etc. Bids can be submitted in a similar way. In addition, the buyer who wants to pay for the products purchased will be able to make the payment via the mobile application without waiting in line at the cash register, and then another beacon at the exit gate will indicate that the payment is made from the digital wallet in the existing mobile application during checkout (Sniderman and Raynor, 2015). In addition, in-store interactive screens equipped with rich content allow the customer to research in-store or online, making it easier to personalize products.

Smart shelf applications: Digital labels to be used on store or market shelves will not only reduce the use of paper labels and reduce waste and cost, but also ensure that pricing is applied more flexibly. For example, in the Kroger retail chain in the USA today, by replacing the paper labels on the store shelves with digital labels, prices can be updated much more quickly and elastically according to the demand and bulk situation. (Kantarcı, et al. 2017). In addition, effective stock management can be possible thanks to sensors that can measure weight, temperature or number on the shelves.

Reducing product loss and efficient use of energy: Temperature sensors will be able to act and send an alarm to the relevant person or devices in case the products will be exposed to extreme heat or extreme cold, so that they will deteriorate or wear out. In addition, sensors that instantly obtain data from intelligent heating, cooling and ventilation machines will be able to send this data to a central display panel, so that the store environment can be brought to ideal weather and temperature conditions manually or automatically (IBM Watson, 2016).

Preventive maintenance: Monitoring of component and hardware performance with embedded chips or sensors; overheating, wear, failure, etc. will be analyzed with signs, so that machines and devices can be intervened without breaking down or losing their functions (IBM Watson, 2016). For example, sensors will be able to sense that the deep freezer in the market is overheating and transmit this to the market manager via the mobile application.

Queue management: Methods such as mobile wallet/payment will reduce queue formation in stores. However, heat maps that can be used in case of congestion in the cash registers or aisles will ensure timely service and directing the relevant personnel to the relevant places immediately (IBM Watson, 2016).

Inventory and fleet management: RFID tags provide GPS location, temperature, pressure, weather and road condition, etc. It can collect environmental details, which will make it easier to record inventory over the supply chain system and fill the shelves instantly according to customer demand, while ensuring that the logistics service is safer and easily monitored remotely (IBM Watson, 2016).

Other smart applications: Smart mirrors are another IoT-centric technology. For example, the Burberry brand provides its customers with all the information from the production to the podium images of its products in its London store, with intelligent mirrors placed in the store, thanks to virtual/augmented reality. Thanks to the RFID tags placed on the products, when the product is

brought closer to the mirror, information about the product is automatically reflected on the mirror and guides the customer. Physical store attention measurement is one of its other applications. With this method, in which the stores are constantly monitored with cameras and sensors, the time spent by the customers in the departments and stands of the stores is monitored and the stores and stands are arranged considering the areas where the customers are concentrated (Kantarcı, et al., 2017). Thanks to the virtual dressing rooms, which is another IoT technology used, customers have the opportunity to research the products they want on the artificial intelligence screen, to read the relevant features and comments, as well as to share the product they will buy through social networks or to ask for help and suggestions from their friends. In addition, they can try on existing products or products in other stores virtually.

2.5 Internet of Things and Social Media Marketing

Social media marketing refers to the marketing activities carried out by considering the special structures of social media channels. As a matter of fact, social media channels are not just the sum of randomly shared messages, but also politics, entertainment, fashion, consumption, etc. It allows real-time tracking of behaviors and trends in many fields. Today, social media analytics applications include the number of times a website is visited, the number of visitors, the tone of comments created, search engine rankings, comments shared on forums, number of friends, etc. uses algorithms to understand social media factors. In addition, these channels combine human inputs with smart phone data. Thus, users can learn how they shop, eat and travel by using time stamps, check-in data and geographic location information. All these are realized with the support of mobile devices equipped with sensors and real-time correspondence capability (Greengard, 2017). For example, sharing the information of the individual who uses the Fitbit bracelet automatically on the social media page via the mobile application means that the following company obtains information about their exercise habits. In this context, for example, for this customer who is new to running, the relevant clothing company can communicate via the social media platform and send a personalized promotional code to purchase a new running shoe (Payton, 2016.) In addition, 60% of the world's population now uses smart phones (Kantarcı , et al., 2017). However, while the number of active social media users in the world is approximately 2.8 billion, the average number of people using social media through mobile channels is 2.5 billion. This shows that one out of every three people in the world uses social media actively via mobile devices (Kemp, 2017). The integration of mobile devices and social media points to an important phenomenon that facilitates the establishment of IoT-based communications with consumers.

3.1 Logistics 5.0

As a natural result of information systems and the digitalization movement, today's world is experiencing the 5th social transformation process. This transformation process is developing in a way that forces the industrial life to implement radical changes. The manufacturing vision of the future has 4 basic components. These are developing as “product”, “intelligence”, “communication”, “information network”. Cyber physical systems, sensors, internet of things, machine-to-machine contact (M2M), artificial intelligence data networks and secure cloud computing environments are widely developing to animate these 4 basic components. This trend naturally affects all processes such as product design, process design, quality management and marketing, and a process transformation takes place with a comprehensive process innovation. As it affects all processes of businesses, this change and transformation requires the restructuring of supply processes. It is seen that business models that will lead to widespread use of 4 Party, 5 Party and 6 Party Logistics services will develop. This section examines the effects of the opportunities and innovations created by the fifth industrial revolution on logistics management. In this context, it is aimed to create a road map that businesses can implement in general terms. The basic philosophy of this roadmap will be to point out which technologies are primarily applied in the logistics sector and the elements necessary for determining investment strategies in this context (Öztemel and Gürsev, 2018).

Globalization brings with it competition and harms companies that cannot get out of their domestic market. Companies that want to be successful in the global market must have a successful logistics strategy. Logistics is an important function in the supply of raw materials to produce the products of the enterprises and the delivery of the sold product to the customer. Businesses that make their logistics processes efficient and cost-effective can outperform others.

The concept of Industry 4.0 was first mentioned in Germany in 2011. Other global powers, such as the USA and China, have explained their own road plans by giving the same term with different names. The UK calls this process "Smart Manufacturing Coalition", EU "Factories of the Future", Japan "Society 5.0", France "Future Industry Initiative". In fact, this definition and explanation made by Germany created the concept of an industrial revolution planned differently from other industrial revolutions. The previous industrial revolutions were named after the next industrial revolution began to show its effects. The definition and explanation created by Germany defines the new period in which the studies carried out after 2011 will take us in the next 20 years. Our country's economic goals and the demand to be among the top 10 economies therefore create a similar need for planning and work (Öztemel and Gürsev, 2018).

If we look at the concept we call big data analysis, it is of great importance in terms of production forms and content. Companies and their increasing capacities create big data. Detailed analysis of these data leads to both an increase in productivity in production, an increase in quality and success in demand forecasts. Industry 5.0 considers systems to be successful in data analysis as a basic condition. A company that cannot analyze customer data and measure and evaluate the performance of its own processes will not be able to stay in this industry age (Öztemel and Gürsev, 2018).

The communication of robots and machines plays a major role in the Industry 5.0 strategy. Unmanned production processes in new generation production facilities called dark factories will be carried out through the communication of machines with each other through a process called M2M. The removal of robot systems and people from production lines will provide a great increase in productivity increase, energy saving, quality increase and product diversity. Simulation efforts will also be of great importance in this process. Products will be checked through simulations before they go to market, and this will shorten their time to market (Öztemel and Gürsev, 2018).

It is another topic that will enable machines to communicate with each other in the structure called the Internet of Things. Machines will plan their maintenance periods in advance, and the loss of maintenance time in the production line will be minimized due to bottleneck processes. In the near future, with the help of these technologies, devices will be able to communicate with each other and with control centers and provide the opportunity to manage analysis and decision-making processes from a single source. Thanks to the increase in the performance of cloud technologies, the response time will be much shorter. As a result, the data and functionality of machines on cloud platforms will increase and more data-driven services will be offered to production systems. 3D printer systems and augmented reality applications will also make great contributions to both the requirements of the market and the promotion and advertising processes (Önday, 2021).

The logistics sector is greatly affected by all these developments. First of all, all innovative solutions and approaches greatly change the logistics and supply chain business processes. Human-powered operational processes are rapidly being replaced by autonomous vehicles and robots. Data analysis is now more of a priority for the logistics industry. Autonomous steering of vehicles and effective route optimization are now a necessity for increased efficiency. Innovative approaches to warehouse systems and intelligent products within the industry 5.0 philosophy support the increase in productivity and profitability. The logistics sector is not only a local but also a large market where global competition is experienced. It is of great importance that the right investments are made and that the results of the investments are effective. Simulation

methods to be used in the decision-making period also have priority in this regard. All sub-branches in the logistics sector will be affected by this change at the same rate. As it is not possible for any logistics company to continue its life without being affected by this change, its logistics structure will change rapidly with its own internal dynamics (Önday, 2021).

In order to see the effects of Industry 5.0 in the logistics sector, previous industrial revolutions should be analyzed correctly. Other industrial revolutions, just like in this industrial revolution, were formed out of needs. In the Industry 5.0 process, the fact that the machines are in communication with each other over the internet will enable the "just in time" logistics services to work more efficiently or prevent machine breakdowns, while reducing the idle time in production and consequently more efficient use of resources. New vehicles, new fuel and energy resources, infrastructure and new employment areas will affect all kinds of logistics, especially transportation logistics. Industry 5.0 will affect all stages of providing the right product, which we call the 7 lines of logistics, in the right quantity, in the right way, at the right time, from the right source, in the right way, at the right price. Technologies that trigger digital transformation are briefly defined as CAMPS. C (Cloud) is cloud computing, A (Analytics) is big data analytics, M (Mobility) is mobile world, P (Productivity) is Productivity, S (Security) is cybersecurity. In other words, an institution that wants to realize its digital transformation should start with cloud computing and end its transformation with security. The existing jobs and business processes in the logistics sector will change completely, and the qualifications of people working in the logistics sector will also change. Data logisticians, data mining, autonomous systems controllers, and many more new business units that we don't even know today will emerge. In other words, data logistics has taken a step towards becoming one of our most important business processes and will continue to be. The 7 market trends that will pave the way for the industry are listed as follows: growing customer base, increase in digital buyer base, geopolitical and economic developments, and growth of different segments after the 2008 crisis, internet of things, and increase in internet platforms, 3D printing and driverless vehicles. Accordingly, the use of new technology in logistics management, new generation mobile systems, the use of drones in the logistics industry, smart urban logistics, internet of things, augmented reality applications, optimization efforts are being developed to analyze these trends (Öztemel and Gürsev, 2018).

In the report prepared by MUSIAD, although the sector that spends the most effort on industry 5.0 in Turkey is Electronics, the logistics sector has the same investment rate as large sectors such as automotive and industry-security. It is seen that companies in the logistics sector have invested heavily in the new industry 4.0 and industry 5.0 eras.

Since the competition in the logistics sector is very high, changes are inevitable. The effect of "Warehouse Management Systems" in warehouse systems is increasing rapidly. AS/RS and RFID technologies are also an integral part of the warehouse management system. After the new industrial revolution, warehouses will have infrastructures that can automate operations, can be monitored online, and provide instant reporting. Drones have also been used in the management of warehouses. There are applications where drone cameras count the goods in the warehouse and record them in a certain order, thus leaving a lot of time for employees to be busy with other works. E-Commerce systems are changing quite rapidly. The increase in the number of online sales has brought us the term e-logistics. We are entering a new era in which small packages have gained momentum in the international market and air express cargo is increasing rapidly. Virtual reality glasses are of great importance in warehouse systems and training processes. Many shipping companies plan to train their employees to detect potential hazards on the road using virtual reality (VR) glasses. The unmanned use of vehicles and ships has gradually come to the fore, and accordingly, an increase in unmanned vehicles is expected in the near future. Although data mining applications are of great importance for the logistics sector, they will now provide efficiency in demand management studies. It is observed that cloud computing applications are mostly used by logistics companies. Industry 5.0 components are causing major changes over the

logistics sector and are expected to provide great acceleration in productivity and profitability increase in the near future (Öztemel and Gürsev, 2018).

The term Industry 4.0 and its components are among the important topics that have found their place in every field in our country. Our country's late involvement in the previous industrial revolutions and the problems it has experienced in its economy cause it to show more interest in this new industrial revolution. Although many academicians and researchers have concentrated their publications on this subject in the recent period, the point that will lead the world has not been reached. For this reason, all institutions in the state and private sectors in all areas of the industry and service sectors should be involved in this process with great cooperation and invest in the digitalization of their own processes. Industry 4.0 is not only about some technological tools such as the internet of things, cloud computing and three-dimensional printers, but also a large-scale approach in the form of education and entrepreneurship of human beings, keeping innovation at the forefront and distributing digitalization to all business processes. Because of the intense competition and change environment it contains, the logistics sector needs technology and the innovations it brings. With its geography and logistics advantages, our country needs to rapidly enter the digitalization process in all transportation types and all components of logistics management. Although there has not been a large-scale study measuring the Industry 4.0 performance of the logistics sector in our country, it is seen that the country is in a position between Industry 2.0 and Industry 3.0 in the study conducted by TUBITAK (2016). In addition to this information, the fact that the logistics sector has very different dynamics in our country should also be taken into consideration. Although the majority of the sector consists of small and medium-sized companies, investments are insufficient to provide cost positive aspects. In addition, the leading companies of the sector make large investments to take advantage of the advancing technological developments. When it is desired to make an evaluation for logistics companies, it will be more accurate to list the companies in the sector not on the basis of quantity but as turnover and the evaluation will be more accurate in this direction (Öztemel and Gürsev, 2018).

The fact that there are mostly small and medium-sized companies throughout the sector reveal how important the investment plans in the industry 5.0 journeys is to the companies. In the results obtained, it has been determined that the basic needs in the logistics sector are qualified workforce, correct investment and technology management, and accurate analysis of the processes and data of the sector. Logistics training should be prepared by considering new technologies. Incentives and tax advantages should be provided for companies to make investments. In order to have global companies in the logistics sector, it is essential for companies to understand the changing world and changing technologies correctly and to transfer them to the corporate culture. In future studies, more detailed investigation of logistics applications in autonomous systems, data mining and augmented reality technology will contribute to researchers (Öztemel and Gürsev, 2018).

3.2 Hr 5.0

Özdoğan (2017) likens industrial revolutions to the organizational structure of a firm; points out that they have to develop themselves, learn and change in order to survive. Especially with Industry 2.0, the main factor determining the route of organizations has been technology. Therefore, countries in the macro sense and businesses in the micro sense will stay in the industrial revolution and develop themselves as long as they can follow these technological developments. On the other hand, it can be argued that countries and businesses that have difficulty in following technological developments and their effects will be negatively affected.

Until very recently, business owners explained the business volume of their businesses either by their turnover or by the number of workers they employ. The size of the turnover, or headcount, was a source of praise, even if profit rates were low. However, criteria such as the number of factories, production amount, number of machines could give an idea about the size of the

enterprise and were considered important factors. However, there was less interest in “management skills, R&D activities, innovations, financial management”. Industry 4.0, as seen above, reversed the management pyramid and brought the subjects of "R&D, finance management, market management and innovation" into focus. The number of factories, the number of machines, the number of production lines and the number of employees has caused such criteria to fall into the background. Now, developed countries find it more logical to employ “three brains working in one office and earning billions of dollars” instead of large factories.

Industry 4.0 which brings the physical and virtual worlds together, points to a new level of organization in the value chain within the product life cycle (Alçın, 2016). The Industry 5.0 vision can be compared to an elephant. In order to take this big elephant to the desired point, we must divide it into correct parts while preserving its economic value and functionality. In order to understand the Industry 5.0 components, we can start with an example: If we explain the “Y” symbol, which is also the Scheer Group logo; The left branch of the letter “Y” refers to the “Customer, Order and Logistics” processes; The right branch represents the Product and Service Development Processes and these processes are combined in the trunk, namely the Product Realization/Manufacturing processes. As a whole, these processes represent a company's value chain. With Industry 5.0, customers can access the product/service through multiple channels, see it instantly, and order the product in a special way. On the other hand, production processes can make instant decisions on their own, but they enable modular and flexible production areas by working integrated with other production areas (Acaralp, 2017).

Will Industry 5.0 be a human resources nightmare? Or will it take human resources to a new level, similar to what happened as a result of previous industrial revolutions? There are different views on how the revolution will affect the labor market. While some claim that employment will grow by differentiation with Industry 5.0; another segment claims that unemployment will increase gradually, based on the potential effects of Industry 5.0 on production and other areas, and as a result, a pathetic picture will be encountered.

When all industrial revolutions are examined, it can be said that they have some paradoxes in themselves. As Özdoğan (2017) stated, while more products were produced and people's living standards increased with the first industrial revolution, on the other hand, it is seen that a working class working under poor and difficult conditions was formed. As a result of the aforementioned four industrial revolutions, we see that the need for manpower is decreasing, but the need for qualified people is increasing; it is not the number of people, but talents that matter. In order to explain this situation, Alçın (2016) referred to Andre Gorz's Goodbye Proletariat book, and said, "Is it the end of business?" their anxiety; Gorz claimed that the work, and therefore the work, would end in 1980; however, he states that the number of both workers and service personnel increased exponentially throughout the world at that time, which was described as Post-Fordist.

Human resources, which monitor and control the production processes in the Industry 5.0 period, will be one of the main elements of production. Since there will be many production systems, it can be argued that the number of people who will control these production systems will increase. In such a system, it is estimated that there will be problems arising from the failure of employees to fulfill their responsibilities, except for technical malfunctions that may occur in the machines. In this context, Alçın (2018) mentions that the need for “very good observers, planners and pro-active employees (Smart Workers) who interpret the virtual world and the physiological in the best way and synchronize this information in line with the needs of the recipient” will increase in artificial intelligence factories. HR 5.0 specialists will have to find and train not only employees who perform the work, but also those who develop the business.

Industry 5.0 will be the age of engineers. Machines will now be able to do some of the work required by many professions that exist today and are carried out by human beings. For example, “devices can do everything from analysis to diagnosis; a mobile phone will be able to check all

your health data, and report it to the hospital when you have a problem with your blood values and have the analysis done".

The concept of HR 5.0 can be defined as "an innovative approach where talent management processes are carried out through digital platforms, operational processes are shortened, mobility is accelerated, and providing a development environment where employees can realize their dreams". The next generation HR is expected to lead the digital transformation of organizations.

3.3 Tourism 5.0

The industrialization process has entered the process of evolution for the fourth time today with information and contact technologies. Since the tourism industry is a dynamic industry that keeps up with innovations and technologies, Industry 4.0 technologies have found application in the tourism industry. With the use of Industry 4.0 technologies for travel purposes, the concepts of 'smart tourism' have emerged. The artificial intelligence travel, called Tourism 4.0, has turned the attention to the users of Industry 4.0 technologies. Along with Industry 4.0, the philosophy of Society 5.0 emerged in Japan. At this point, it seems inevitable that Tourism 4.0 will lead to the concept of 'Tourist 5.0', which is called 'super smart tourist'. The purpose of this section is to discuss why people, and therefore tourists, perceive industrial revolutions before other people and what the deep underlying causes might be.

Technology can be defined as an ergonomic process that reproduces human life due to its continuous development, affects the behavior plane and living spaces, and is based on the ability to think and produce information. For this reason, technology can be considered as an important power that can change and transform the people who are considered to be its creators, the nature of people, their living spaces and nature, which needs constant monitoring and shapes the future. The series of industrial revolutions, which started with the transition of the industry from human power to machinery, began with the "Technological Revolution" when superior electrical technology produced larger-scale production and more complex machines compared to the previous period. On the other hand, it is known that the digital revolution started with the first computers in the 1950s. Computers formed the foundations that led to the next industrial revolutions. Machines have become self-managing in many ways, often using web technologies or Internet of Things. The point reached is now called Industry 4.0 and includes the use of cloud technology and the importance of big data. Now the world is coming to a new era and it is not even possible to predict how and in what direction the rapidly developing technology will evolve. But before us lies a new revolution called Industry 5.0, where man and machine seem to find ways to work together to improve the means of production, their efficiency. Because it can be foreseen that after this revolution, it will become increasingly difficult to name future revolutions even numerically and there will be a period of revolutions and transformations that even the concept of speed cannot explain in itself. While the intelligent travel, called Tourism 4.0, has turned the attention to the users of Industry 4.0 technologies, the philosophy of Society 5.0 has emerged with Industry 4.0 in Japan. At this point, it is inevitable that the term 'Tourist 5.0', which will be named as 'super intelligent tourist' in Tourism 4.0, will emerge. Therefore, the aim of the study is to open the issue for discussion by presenting ideas about why people and therefore tourists are number one ahead of industrial revolutions.

According to Hooijdonk (2015), although intelligent technologies are accepted almost unnoticed by the users, he emphasizes that they take place in almost all areas of life today. The fourth industrial revolution, called Industry 4.0, includes robotization, Internet of Things, artificial intelligence, sensors, cognitive technologies, nanotechnology, Services of the Internet, quantum computing, wearable technologies, augmented reality, intelligent signaling, artificial intelligence robots, big data, 3D and smart grids. new generation technologies have led the way. Industry 4.0 technologies have begun to change business environments and lifestyles by being used in areas such as business, communication and education in our lives.

Smart tourism is defined as travel supported by initiatives provided at the destination to collect data from human minds about physical infrastructure, social connections, government institutions, organizations. Smart tourism has a clear focus on efficiency, sustainability and experience enrichment (Gretzel et al., 2015a). Intelligent hotel management system (Topsakal et al., 2018a), smart ticket (card) system (Topsakal et al., 2018b), artificial intelligence remote video viewing system, intelligent tour guide system (Yüzbaşıoğlu et al., 2018) and smart travel in smart tourism development. Internet of Things technologies such as agency system is used (Gretzel, 2011). In short, new generation technologies work on the basis of efficient and effective communication in real time.

If we take the subject on its own plane, cloud computing, Internet of Things and end-user web service systems are technological tools or abstract resources like human resources and information resources. The real effects of smart technologies emerge with the combination of technology and existing infrastructure (Lopez de Avila, 2015). For example, near field communication (NFC) is an important technology that has become widespread in smart phones and offers many new applications for the navigation industry (Egger, 2013). Internet of Things technology enables physiological objects to be connected to each other via the Internet (machine-machine). Thus, machines can communicate and work together through remote controls (Holler et al., 2014). In addition, since the use of artificial intelligence phones and applications has provided useful information on the tourist's trip to the destination, it can be considered as an intermediary store at the acquisition and reflective stage. Because artificial intelligence phone users can access destination-specific applications through artificial intelligence phones and send messages to tourists through technologies such as Beacon at the destination (Nabban et al., 2016). Beacon technology can locate tourists and send personalized messages (Toedt, 2016).

AI technology improves accuracy and brings hotel managers a better understanding of tourist demand and supply. Thus, planning a better marketing strategy results in financial management and human resource planning (Claveria et al., 2015). The Internet of Things and sensors installed in the hotel / around the city collect significant internal and external data such as the availability of facilities in the hotel, the location of the tourist, weather conditions, road conditions and airport traffic. While this information does not directly affect the experience of tourists, it affects the overall impression and satisfaction of tourists.

Hotel managers expect technologies to reduce the time and human energy spent in operations (Buhalis and Law, 2008), while increasing service quality (Tuominen and Ascençao, 2016). Hotel guests, on the other hand, want to search for hotels more quickly and effectively in order to stay at the best room rate (Xiang and Gretzel, 2010) (Seric and GilSaura, 2012). However, due to dynamic changes in the political, economic, social and technical environment, internal data alone cannot produce accurate forecasting and pricing strategies. An effective revenue management and accurate revenue estimation require both external data and big data (Ramos et al., 2015).

The potential of man's communication with man and things to become more and more effective, for things to break away from people and for human beings to become self-reifying, or to make people an object of consumption by subjecting them to non-human perceptual activities, is hidden in the technological development process itself, which constantly produces itself. In this case, it is likely that future technologies will bring biotechnologies that will free people from the captivity of objects. It may be possible for the people of the future to have opportunities to compete with the humanoids they produce. Because it is quite clear that technologies will progress independently of time in the coming periods. Therefore, new revolutions will not appear sequentially, and since they cannot be measured over time, they can be named with their features and effects. If artificial intelligence products are humanoids, new technologies developed by human beings to compete can push the other world behind the ages. There may be different concepts such as the new world and the old world. What will the social life of that world be like? What kind of life will they lead? What will their average life expectancy be? How will they travel? It seems inevitable that the topics will open up new areas of discussion, such as what kind of

destination they will prefer. From the dialectical point of view of the idea of progress or self-reproduction by evolution, progress can be simply defined as development from one state to another. However, developments become a trigger or bed for further developments. Developments are constantly producing themselves by merging with their opposites. Because people can think, produce information using systematic methods and produce technologies that will make their own life easier. On the other hand, by pulling itself out, it paves the way for science to produce itself. These processes usher in an era of continuous innovations and hyper-transformation.

Although the concept of innovation is mostly considered as new technological developments, it has been noticed that technological development also affects social life and societies in recent years. This interaction, however, has pushed technologies to examine in the human context. When technological concepts are examined in the context of human beings, researchers of the philosophy of concepts lead researchers such as Schumpeter, Max Weber and Werner Sombart to find themselves in their theories. Because people who direct technology and industrial revolutions are human beings themselves, through the needs of people. Tarde's social theory offers a perspective for innovation. Tarde's point of view differs from Schumpeter's point of view of economic and technical innovations, from the sociology of technology focusing on the social consequences of changing technology (Ogburn, 1937), the social shaping of technology (Williams & Sörensen, 2002) or the social structures of technological systems (Bijker et al., 1987). is further away. According to Tarde, emulation is present in all changes and simultaneously creates innovations in social structure and practices. According to the author, there is only one determining factor that constitutes the constitution of society: the common imitation of individuals who are mobile with the innovations of others. Inventions and successful imitation attempts enable development and change. Therefore, social innovations occur. Social transformations are explained by the attempts of individuals to reflect (Michaelides and Theologou, 2010). These are the guiding, determining and explanatory factors that are the basic elements of social transformation processes.

The idea of progress first guides the industrial revolution cycle. Businesses have to move forward, so the difference between generations, the limited time of people, the technologies brought by the old revolutions require it. When the idea of progress occurs in individuals, private enterprises, international organizations and R&D organizations realize this desire and develop technical innovations for it. In this way, progress is made and the needs of individuals are met. However, meeting the needs with technical innovations brings change. Because when progress is made with technical innovation, things are no longer done with the old methods. At this point, while some individuals can facilitate change by adopting technical innovations, some individuals resist change due to cultural influences. As a result of this, social problems such as the exclusion of those who cannot adapt to the new technology, the mechanization of some jobs, machine-machine communication, unemployment and migration resulting from human-robot interaction begin to emerge. Solving some problems that arise with technical innovation with old methods becomes almost impossible due to progress. Therefore, the idea of moving from one industrial revolution to another without adapting, even when lagging behind, is nothing but a utopia. In this context; Adaptation of education systems and curricula to industrial revolutions, and a labor force for new business environments should be trained. Non-governmental organizations, private enterprises, state, public institutions and international organizations that are already aware of social problems begin to seek new ways to solve social problems and develop social innovations as a result. Social innovations, on the other hand, provide social change and adaptation to the industrial revolution in the community, as they increase welfare in the society, reduce unemployment and benefit regional development. However, with the change of the community, the needs of the society also change. Again, progress is needed to meet these requirements. Thus, the idea of progress, which is the first stage of the industrial revolution cycle, has been reached again.

As a result, it can be said that due to the industrial revolution cycle developed in the study, change is inevitable due to the supply-demand balance at the first stage, those who cannot keep up will be eliminated, those who adapt can survive, and therefore only competition is possible by taking measures to accelerate the adaptation to the change. Due to this innovative change, problems such as unemployment, migration, exclusion can be minimized by foreseeing and taking measures beforehand. In addition, due to this change, while some forms of business or professions are closing or decreasing, new types of occupations will occur within the scope of adaptation. Legal arrangements or privileges may be provided to those who can adapt / transform into the new order of businesses or institutions that are negatively affected by these developments. In this way, problems such as unemployment, migration, exclusion can be prevented and even the negative situation can be turned into a positive by exporting these new products or services to those in need abroad, due to its role as a pioneer in new sectors that may occur.

Conclusion

It is estimated that the world population, which is currently approaching 7 billion, will reach 9 billion in 2050. 9 billion people live within the resources that the world can offer and replenish. However, if the production and consumption habits in the world continue in their usual course, we will need 2.3 worlds in 2050 to maintain our current level of prosperity. It is still possible to have a sustainable world in 2050. The world currently has the knowledge, talent and technology to establish this balance. Having a sustainable world will only be possible with the global partnership and coordination of countries. Countries have to create sustainability agendas and even activate action plans within the framework of transparency and accountability principles and with a participatory approach.

When we look at Turkey from the beginning of the 20th century, we see that the Turkish economy has risen to the top of the world's economies and is now among the countries that have a voice at the global level. Leaving behind the turbulent period of the 1990s, Turkey has succeeded in becoming the world's 17th largest economy by implementing its economic development target step by step.

Turkey's economic success on a global scale during the said period was not reflected in its development processes at the same level. Turkey, which ranks 83rd among 169 countries according to the Human Development Index announced annually by UNDP, has many steps that need to be taken in terms of human development components. The goal of being among the top 10 economies of the world in 2023 is only to make our development sustainable; in other words, it will be possible by establishing a balance between the needs of life and the sustainability of natural resources. Having reached a population of 100 million in 2050, Turkey's sustainable prosperity and economy can only be achieved by following the change in global interaction. The 2050 vision will succeed if all countries have a common goal in coordination, rather than an approach that countries can adopt on their own.

While the sustainable development process offers many opportunities to business life, it also contains many risks that may cause the process to be interrupted. Entrepreneurs who foresee opportunities and take action will gain sustainable competitive advantage in this process. On the other hand, foreseeing the risks that will hinder the process will accelerate the search for solutions and reconciliation.

In order to realize the sustainable development vision, a dialogue platform should be established where all stakeholders will come together by raising awareness in the state, civil society, business world and society in general.

2050 Turkey Vision is a road map that designs how we can reach the Turkey we want to live in 2050 within the framework of the evaluated sub-titles. It should not be forgotten that the priorities and applications of the stones that will form this process, which extends to 2050, may change

depending on the conditions. However, the Vision 2050 goal has to be the same for the whole world: 9 billion people living in prosperity and happiness within the world's resources.

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ETİK ve BİLİMSEL İLKELER SORUMLULUK BEYANI

Bu çalışmanın tüm hazırlanma süreçlerinde etik kurallara ve bilimsel atıf gösterme ilkelerine riayet edildiğini yazar(lar) beyan eder. Aksi bir durumun tespiti halinde Toplumsal Politika Dergisi'nin hiçbir sorumluluğu olmayıp, tüm sorumluluk makale yazarlarına aittir.