EFFECTS OF INDUSTRY 4.0 ON AUTOMOBILE MARKETING STRATEGIES

A RESEARCH AMONG AUTO EXECUTIVES IN TURKEY

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Abstract

The world is at the edge of the much expected digital transformation orchestrated by the Fourth Industrial Revolution. In recent years, the industry has been going through a process that involves fully digitizing production processes, especially the automotive manufacturing industry.

Intelligent production technologies such as autonomous robots, laser cutting, 3D printers, as well as new technologies such as big data, cloud data, augmented reality (AR) and the Internet of Things (IoT) have entered our lives with the Industry 4.0 revolution.

To face the increasing complexity and greater flexibility in production processes in the markets, it is necessary to pay more attention to customers. Recent literature shows that Industry 4.0 allow manufacturing firms to achieve such results quickly customized products and time to market response with higher efficiency and productivity rates.

The concept of Industry 4.0 appears for the first time in Germany in 2011 as a concept that has been studied in economic policies. It can be considered as a strategy related to high technology and internet systems. The potential revolution called "4.0" is followed by the footsteps of the three previous industrial revolutions.

The concept of Industry 4.0 can be explained as the industrial revolution based on cyber-physical systems, the Internet of Things (IoT) and therefore concepts and technologies that support communication over the internet or involve continuous internet communication. This revolution

means data exchange and unlimited interaction not only between consumer and consumer (C2C) but also between consumer and machine (C2M) or between machine and machine (M2M).

Industry 4.0 describes the widespread integration of information and communication technology in industrial manufacturing. However, it is not enough to address the developments associated with the fourth industrial revolution from just a technological perspective, companies also need to transform their organization and their marketing strategy and their culture as well. While advanced technologies do make it possible to access a much wider range of data, the ability to leverage the underlying potential of this data is just as dependent on a company's organizational structure and culture. From this point of view, the ultimate goals of companies are to adapt to a changing environment continuously and quickly and to increase their learning skills.

In the future, cars, road signs, traffic lights, car parks and other types of transport infrastructure will use sensors and processors to automatically collect, analyze, process and share data. Vehicles will themselves become nodes on the web (smart cars), enabling intelligent traffic flow management (smart traffic). This process will be driven by especially Internet of Things (IoT) and big data management.

A company's main goal should focus on understanding and fulfilling its customers' needs. This is one of the main topics of Marketing Management. As always repeated, the marketing department plays a critical role in actively guiding customers to the purchase decision. By integrating individual purchasing processes into digital purchasing processes, adding value to the customer and creating customer loyalty from an early stage and placing the customer in the center of the company.

This study focuses on marketing strategies in the adaptation of Industry 4.0 technologies. Industry 4.0 is an industrial revolution that occurs at the factory level and changes the way products are produced, but it is also a digital revolution. Marketing plays a crucial role in providing feedback to the production function. Therefore, it can be emphasized once again that firms should pay more attention to their marketing strategy.

As briefly, marketing is additionally developing similar to new digital technology referred to as industry 4.0. To support the new digital challenges, to form cost reduction and to extend market growth, majorities of the firms are getting to change their marketing strategy alongside industry 4.0. So, it requires a next generation of marketing and sales for the organization. Industry 4.0 can be considered as market-oriented technologies that help companies improve the standard of relationship with buyers, as well as reduce production costs, reduce cost in terms of marketing and sales, and increase market growth with flexibility. The hypotheses of the dissertation are related to this subject.

In summary of the above explanations, this study analyzes the relationships between Industry 4.0 and the automobile marketing strategy. In this analysis, determinants are organized with the help of technological, organizational and environmental research model. Six indicators have been investigated and examples of auto companies were investigated in Turkey.

ENDÜSTRİ 4.0'IN OTOMOBİL PAZARLAMA STRATEJİLERİNE ETKİSİ TÜRKİYE'DEKİ OTOMOBİL MARKA MÜDÜRLERİ ARASINDA BİR ARAŞTIRMA

Özet

Dünya, Dördüncü Sanayi Devrimi tarafından düzenlenen, çok beklenen dijital dönüşümün eşiğinde. Son yıllarda endüstri, özellikle otomotiv imalat sanayi olmak üzere üretim süreçlerinin tamamen dijitalleştirilmesini içeren bir süreçten geçmektedir.

Otonom robotlar, lazer kesim, 3D yazıcılar gibi akıllı üretim teknolojileri ve büyük veri, bulut verileri, artırılmış gerçeklik (AR) ve Nesnelerin İnterneti (IoT) gibi yeni teknolojiler Endüstri 4.0 devrimiyle hayatımıza girmiştir.

Piyasalardaki üretim süreçlerinde artan karmaşıklık ve daha fazla esneklikle yüzleşmek için müşterilere daha fazla dikkat etmek gerekir. Son literatürler göstermektedir ki, Endüstri 4.0'ın imalatçı firmaların bu tür sonuçları hızlı bir şekilde özelleştirilmiş ürünler ve daha yüksek verimlilik ve verimlilik oranlarıyla piyasaya çıkış süresine ulaşmasına izin verdiğini göstermektedir. Endüstri 4.0 kavramı ilk kez Almanya'da 2011 yılında ekonomi politikalarında incelenen bir kavram olarak ortaya çıkmıştır. Yüksek teknoloji ve internet sistemleri ile ilgili bir strateji olarak düşünülebilir. "4.0" olarak adlandırılan potansiyel devrimi, daha önceki üç sanayi devriminin ayak izleri takip etmektedir.

Endüstri 4.0 kavramı, siber-fiziksel sistemlere, Nesnelerin İnterneti'ne (IoT) dayalı sanayi devrimi ve dolayısıyla internet üzerinden iletişimi destekleyen veya sürekli internet iletişimi içeren kavramlar ve teknolojiler olarak açıklanabilir. Bu devrim, sadece insan ve insan (C2C) arasında

değil, aynı zamanda insan ve makine (C2M) arasında veya makine ve makine (M2M) arasında veri alışverişi ve sınırsız etkileşim anlamına gelir.

Endüstri 4.0, endüstriyel üretimde bilgi ve iletişim teknolojisinin yaygın entegrasyonunu tanımlamaktadır. Bununla birlikte, dördüncü sanayi devrimiyle ilişkili gelişmeleri sadece teknolojik bir perspektiften ele almak yeterli değildir, şirketlerin organizasyonlarını, pazarlama stratejilerini ve kültürlerini de dönüştürmeleri gerekmektedir. Gelişmiş teknolojiler çok daha geniş bir veri aralığına erişmeyi mümkün kılmakla birlikte, bu verilerin temel potansiyelini kaldırabilme yeteneği bir şirketin organizasyonel yapısına ve kültürüne bağlıdır. Bu bakış açısıyla, şirketlerin nihai hedefleri değişen bir çevreye sürekli ve hızlı bir şekilde uyum sağlamak ve öğrenme becerilerini arttırmaktır denebilir.

Gelecekte yıllarda, araçlar, yol işaretleri, trafik ışıkları, otoparklar ve diğer ulaşım altyapısı verileri otomatik olarak toplamak, analiz etmek, işlemek ve paylaşmak için sensörleri ve işlemcileri kullanacaktır. Araçların kendileri web üzerinde (akıllı arabalar) düğüm haline gelecek ve akıllı trafik akışı yönetimini (akıllı trafik) sağlayacaktır. Bu süreç özellikle Nesnelerin İnterneti (IoT) ve büyük veri yönetimi tarafından yönlendirilecektir.

Bir şirketin ana hedefi, müşterilerinin ihtiyaçlarını anlamaya ve karşılamaya odaklanmaktır. Bu, Pazarlama Yönetiminin ana konularından biridir. Her zaman tekrarlandığı gibi, pazarlama bölümü müşterileri satın alma kararına aktif olarak yönlendirmede kritik bir rol oynamaktadır. Bireysel satın alma süreçlerini dijital satın alma süreçlerine entegre ederek, müşteriye değer katarak ve erken bir aşamadan müşteri sadakati yaratarak ve müşteriyi şirketin merkezine yerleştirmek...

Bu çalışma, Endüstri 4.0 teknolojilerinin adaptasyonunda pazarlama stratejilerine odaklanmaktadır. Endüstri 4.0, fabrika düzeyinde gerçekleşen ve ürünlerin üretilme şeklini değiştiren endüstriyel bir devrimdir, aynı zamanda dijital bir devrimdir. Pazarlama, üretim fonksiyonuna geri bildirim sağlamada önemli bir rol oynar. Bu nedenle, firmaların pazarlama stratejilerine daha fazla dikkat etmesi gerektiği bir kez daha vurgulanabilir.

Kısacası, pazarlama, Endüstri 4.0 olarak adlandırılan yeni dijital teknolojiye benzer şekilde gelişmek zorundadır. Yeni dijital zorlukları desteklemek, maliyet azaltmak ve pazar büyümesini arttırmak için firmaların büyük çoğunluğu Endüstri 4.0 ile birlikte pazarlama stratejilerini değiştiriyorlar. Endüstri 4.0, şirketlerin alıcılarla ilişki standardını geliştirmesine yardımcı olan, üretim maliyetlerini düşüren, pazarlama ve satış açısından maliyeti azaltan ve pazar büyümesini esneklikle artıran pazar odaklı teknolojiler olarak düşünülebilir. Tezin hipotezleri bu konuyla ilgilidir. Yukarıdaki açıklamaların bir özeti olarak, bu çalışma Endüstri 4.0 ile otomobil pazarlama stratejisi arasındaki ilişkileri analiz eder. Bu analizde belirleyiciler teknolojik, örgütsel ve çevresel araştırma modeli yardımıyla organize edilmiştir. Türkiye'deki otomobil dağıtımı yapan firmalar baz alınarak altı faktöre göre araştırma yapılmıştır.

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Chapter 1

Introduction

Technology has evolved dramatically throughout the end of 20th century (Wook Ok, 2017) and as technology continues to dominate and rule the world, business world has felt the necessity to adapt to the technological advances. (Geçit and Taşkın, 2018, 143). Emerge of technology can be substantiated on industrial revolutions. Industry 2.0 phenomenon included mechanization, steam machines and inventions. Industry 3.0 included, emerge of computers, smart phones and spread of internet use (Eğilmez, 2018, 143).

Industry 4.0 concept included higher percent of spread of technology (Lasi et al., 2014) and Industry 4.0, which is also called fourth industrial revolution has integrated the concept of intelligence acquired production system and futuristic automation. During this era, industry 4.0 has changed the world by adding Internet of Things (IoT), data analytics, cloud computing, robotics and automation, additive manufacturing (Saxena and Awasthi, 2020).

The concept of Industry 4.0 appears for the first time in Germany in 2011 as a concept that has been studied in economic policies. It can be considered as a strategy related to strategy of high technology and internet systems.

The concept of Industry 4.0 can be explained as the industrial revolution based on cyber-physical systems, the Internet of Things (IoT) and therefore concepts and technologies that support communication over the internet or involve continuous internet communication. This revolution means data exchange and unlimited interaction not only between consumer and consumer (C2C) but also between man and machine (C2M) or between machine and machine (M2M) (Roblek, 2016). In order to create high added value for companies and customers, it is still necessary to bring products and services customer-oriented (Kagermann, 2015). Industry 4.0 represents the proliferation of digitalization, the emergence of smart devices, in short, advanced digitalization (Lasi et al., 2014).

With the fourth technological era, full automation and digitization processes will come into play and hence will be demonstrated by the use of electronic and internet technologies (IT) in production and services in a special environment. (Roblek, 2016).

Extensive fields such as artificial intelligence (AI), robots, the internet of things (IoT), autonomous tools, 3D printing technology, nanotechnology, biotechnology, cloud storage and quantum computing can be referred to as the surprising combination of advancing technology breakthroughs (Schwab, 2016).

IoT is a unique concept that is rapidly gaining ground in the scenario of modern wireless telecommunications (Atzori et al., 2010, 1). It has become inevitable to create completely new products and business models in the automotive industry with IoT revolution (Dominici et al., 2016). Undoubtedly, the main force of the IoT idea is the high effect it has on several measures of daily life and attitudes of potential users (Atzori et al., 2010, 1).

Organizations must understand that their related products or services can provide a critical basis for identifying sociological and psychological factors that affect the customer's decision to use connected products. Some companies that have not yet passed from traditional marketing to contents marketing - while they are still within the development and promotion stages of internet-related technologies - now have the newest chances of change to align their marketing strategies with market competition and technology.

Ungerman et al. (2018) proved in their articles that modern innovative marketing features a positive effect on increasing sales and reducing costs, thereby increasing competitiveness. Innovations in businesses implementing digitization have begun to gain speed recently. The present digitization is that the content of the Industrial Revolution called "Industry 4.0". Ungerman et al. (2018), an entity that implements Industry 4.0, product functionality, quality and repair life that better meet customer needs in terms of which the corporate is saying that make it more competitive.

Industry 4.0 will enable it to extend the accuracy of marketing strategies to vary or improve the connection between the customer and therefore the company, and can also enable it to get valuable content relevant to customers and to reply to them in real time. Accordingly, marketing departments can be prepared by developing new products and services or developing new marketing strategies to help protect old customers and acquire new customers.

Hence, the research question is :

How automobile marketing strategy are often affected from Industry 4.0 within the brightness of development of IoT?

This thesis focuses on the importance and impact of Industry 4.0 on automobile marketing strategy and, accordingly, the creation of added value for marketing companies. The thesis is divided into six chapters and it will have a conceptual contribution. After the introductory, the second part includes theoretical framework (reviews of Industry 4.0 and technology, organization, environment research model (TOE)). The third explores the conceptual frameworks, research model and hypotheses. The fourth section mentions methodological framework. Latest part presents conclusions, summary of the research and limitations and proposals for future research.

Chapter 2

Theoretical Framework

2.1 Literature Review

The extant literature has aimed for Industry 4.0 and IoT from a technical perspective. Majority of the literature has been written for the technical fields and also the enabling technologies of Industry 4.0 and IoT. However, there are very limited researches from Industry 4.0 and IoT in relation with marketing field. Especially, how the long run business activities would change supported the event of Industry 4.0 and IoT. Such as, the buyer relation management, retailing, logistics, development, online marketing, marketing strategies, marketing organizations.

The First Industrial Revolution used water and steam power to mechanized manufacturing. The Second Revolution used electrical power to the production. The Third Revolution used electronics and knowledge technology to the automate production. Now a Fourth Industrial Revolution is building on the Third Revolution , the digital revolution that has been occurring since the middle of the last century. "It is characterized by a fusion of technologies that's blurring the lines between the physical, digital, and biological worlds" (Schwab K., 2016).

The industry 4.0 expresses the thought in an industrial revolution which permits the privatization of production by integrating production processes, information technologies and techniques. Industry 4.0 is often counted on common assumptions like internet usage, production flexibility and virtualization of the method. "Industry 4.0 divided into three stages. The primary stage focused on analyzing the requirements of Industry 4.0 on production like architecture configuration system reconstruction and knowledge provision" (Lin et al., 2018).

The second stage links to Industry 4.0 to research the social acceptance of the technology. For example, Masoni et al. (2017) exceeded the limitations of augmented reality (AR) technology and applied it to remote service; finally, augmented reality (AR) has often been considered an effective industry tool again. Li et al. (2017) explained the features and related techniques of existing wireless networks; and ultimately they have created an architecture that supports standard service and information quality. In this way, it is clear to know success and clarify why wireless networking is vital for Industry 4.0 with this type of comparison.

In the third stage, it focuses on the effects of communication attitude. Therefore, the main goal of Industry 4.0 is issues such as risk management, training and competence for people (Lin et al., 2018).

However, there are no studies analyzing the marketing strategy suffering from Industry 4.0 for the empirical approach, especially for automobile industry applied advanced technologies. During this study, this gap has been vanished by using TOE Research Model (technology–organization–environment) between marketing strategy suffering from Industry 4.0 within the automobile industry through examining the factors that impact the advanced technology adoption.

2.2 Industry 4.0 Review

History of industry revolutions has been described in the first part but to give a wider detail about the history of industry revolutions; the first industrial revolution began with the invention of the steam engine at the top of the 18th century, representing the mechanization. The second industrial revolution started at the start of the 20th century, since electrification and Frederik Taylor’s principle of labor division and assembly-line production marked the large-scale production of standardized goods and therefore the beginning automation. Within the 1970s, the third industrial revolution drove forth automation and customized diversity of product and repair variants by extensively integrating information technologies (IT) and electronics into production planning systems, leading to the digitization (Kagermann et al., 2013). Figure 1 illustrates the historical development of industrial manufacturing.

The concept of Industry 4.0 appears for the first time in Germany in 2011 as a concept that has been studied in economic policies. It can be considered as a strategy related to strategy of high technology and internet systems.

This concept has launched the fourth technological revolution, which is predicated on the concepts and technologies that include virtual-physical systems, internet of things (IoT) supported communication via internet that permits endless interaction. Hence, the exchange of data not only between human to human and human to machine but also between machine to machine are accelerated. (Roblek V., 2016).

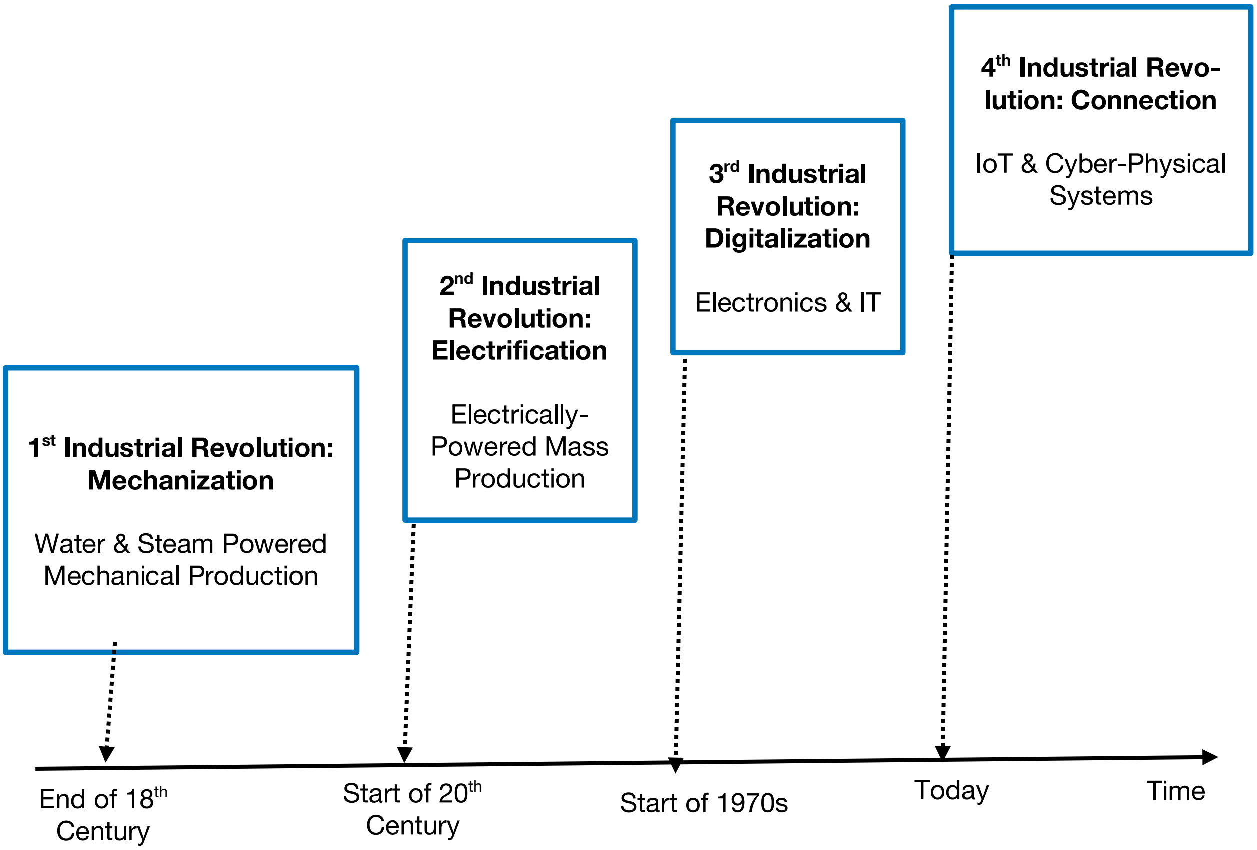

Figure 1 Overview of industrial Revolutions, Kagermann et al. (2013)

The fourth industrial revolution will be valued through the use of electronic and information technologies (IT) in production lines and services, as well as complete automation and digitization processes. The result of some technologies such as 3D printing, online sales , medical treatment from home, ordering food from the shop to the refrigerator, will have a big impact in small and medium sized companies. (Sommer, 2015).

It enables the creation of completely new products and new business models in the automobile industry, especially on the production line with IoT. (Dominici et al., 2016). Firms must consider that their products or services can provide a critical basis for identifying sociological and psychological factors that affect the customer's decision to use connected products. Some organizations that have not yet passed from traditional marketing to contents marketing - while they're still within the development and promotion stages of internet-related technologies - now have the newest changes to align their marketing strategies with market competition and technology. Accordingly, firms can prepare strategies such as new product or new service developments and new marketing strategy. These will help them to keep old customers and find new customers.

While the Internet transformation of the digital industry remains continue, artificial intelligence, big data and connectivity are beginning to replace of the digital revolution. Consistent with Roblek (2016), Industry 4.0 is on the way to affect on the whole transformation of industry such a way that it represents achievement on three points.

1. Digitization of production and, accordingly, linking it to management information systems

2. Automation systems for data acquisition from the assembly line

3. Linking manufacturing sites of supply chain companies

Another feature of Industry 4.0 is increased competition with smart equipment that uses demographic changes, resources, energy efficiency and urban production information.

The increase and expansion of Industry 4.0 with its current core elements concepts (Table 1) are supported the idea of accelerating global urbanization (Roblek V., 2016). Demographic changes are challenging in urban renewal and development to ensure the living standards and infrastructure of urban residents.

Smart technologies have become a critical factor for the success of urbanization and social development. The purpose of this kind of technology is to provide cyclical economical movement, increase revenues, reduce money expenditures, and improve services. It is estimated that it will aim to collect and analyze data from people's environment (Roblek, 2016).

People will need to provide the “digital thinking” event to be managed in a new way. In addition, employees will be given more autonomy and will be allowed to make independent decisions (Roblek V., 2016). That is, technology begins to determine a new and different absence. A positive appearance of Industry 4.0 is that value creation is influenced by efficiency and new business models and gains in the new marketing strategy. However, technological change has positive and negative effects on both employee and business, marketing strategies. There are some concerns that Industry 4.0 will trigger technological unemployment at the end of the day. Accordingly, work profiles in many workplaces will vary. However, it will be necessary to make changes in training and employee development as well.

Fundamental Concept	**Explanations**
Smart factory, smart manufacturing	Smart factories are more flexible and dynamic, and the production process is also equipped with sensors and autonomous systems.
New concepts in the development of products and services	Product and service development can be individualized. Approaches of open innovation and product intelligence and product memory are importance.
Smart products	Products are inserted with sensors and microchips that allow communication via the IoT with each other and with human beings. Cars, T-shirts, watches, washing machines are set to become smart products and they can communicate with smartphone as well.
New systems in distribution channels	Distribution channels are going to be personalized.
Adaptation to human needs	These systems are envisaged to be a combination of personal smart applications such as Siri, Google Now and especially IoT and robotic systems, and they will also be the dominant model of interaction between buyers and sellers.
Virtual-physical combinations	The systems will integrate computers, internet networks and physical processes. For example, vital human functions that allow emergency health care with mobile apps, garments sensors or smart watches or smartphones will be controlled.
Smart Cities	Six factors can be mentioned: smart economy, smart mobility, smart environment, smart clothes, smart living area, and smart governance and people. It is the product of accelerated development of the new generation IT (Information Technology) and knowledge-based economy, based on the web network, and IoT (Internet of Things)
Digital sustainability	Sustainability and resource efficiency are increasingly in the focus of the design of smart cities and smart factories. It is necessary to respect ethical rules when using private information.

Source Roblek V., 2016

Table 1 Fundamental Concept of Industry 4.0

According to Table 2, the customer experience, costs and revenues are some benefits of Industry 4.0 for businesses. It is showed that Six Benefits of Industry 4.0.

According to Almada-Lobo's article, customer experience is explained as the rate of responsiveness to customer needs and the rate of obtaining detailed information. Moreover, the problems that arise can be answered to the customers in a short time, sometimes with the appropriate products and services in real time.

It is mentioned that the costs may decrease after the first investments. In Almada-Lobo's article, it is said that less quality problems lead to less material waste, lower personnel and operating costs.

Revenues can be explained as better quality, lower costs and the ability to serve customers well. With Industry 4.0, manufacturers can open the way to become a supplier preferred by potential customers. In addition, according to Almada-Lobo's article, instead of serving in larger markets, ways can be opened to offer customized and thus higher margin products and services to the customer.

Benefit	**Description**
Efficiency	More automation with fewer people drives the decision making process faster and can keep productivity high. Automation is also known to tend to maintain quality in high and low manual production.
Agility	Focusing on high standardization and small production quantities, Industry 4.0 produces high flexibility in the production process.

Benefit	Description
Innovation	Industry 4.0 is ideal for new product introduction and trials in design, as it is manufactured to accommodate high mixes and low volumes on production lines.
Customer experience	customer experience is explained as the rate of responsiveness to customer needs and the rate of obtaining detailed information; Moreover, the problems that arise can be answered to the customers in a short time, sometimes with the appropriate products and services in real time.
Cost reduction	It is mentioned that the costs may decrease after the first investments. In Almada-Lobo's article, it is said that less quality problems lead to less material waste, lower personnel and operating costs.
Revenues	Revenues can be explained as better quality, lower costs and the ability to serve customers well. With Industry 4.0, manufacturers can open the way to become a supplier preferred by potential customers.

Table 2 The Six Benefits of Industry 4.0 for Businesses

2.3 Industry 4.0 and IoT

IoT envisions a future in which digital and physical entities which can be attached, through appropriate information and communication technologies, to enable a whole new class of applications and services. As mentioned in the first section; Industry 4.0 has changed the world by adding IoT (Saxena and Awasthi, 2020); thus Industry 4.0 and IoT are widely interrelated terms and have been used in literature together.

"The Internet of Things is being a part of the Future Internet. It includes many new opportunities for people, businesses and other companies, as well as for society as a whole" (Haller et al., 2009). One of the principles of Industry 4.0 is to gather the maximum amount information as possible in real time from all the various parts of the value chain. Additionally, when collecting data, data should be collected and analyzed with computerized machines that help reduce production costs and improve quality in order that it is as efficient, fast and versatile as possible.

“To achieve such improvements, IoT systems and Cyber-Physical Systems (CPSs) are essential because they permit the gathering, processing and storage of knowledge obtained in real-world objects”(T. M. Fernández et al., 2018) . Additionally, such systems can find and track related items within the factory information system, supplier system, customer data as well as marketing and sales data systems, so that they can exchange data.

However, it is possible with IoT that Industry 4.0 devices can communicate autonomously among themselves and coordinate with one another and with other remote systems on the web.

“For a long time, sensors and electronic systems have already played a huge role in automobile industry. These become even more important when integrated into the Internet of Vehicles." Because it is more widely known, Vehicle-X Communication refers to communication between vehicles and between vehicles and road infrastructure" (Haller et al., 2009).

While detecting hazards or obstructions on the road as visualized, the vehicle also generates appropriate messages containing geographic locations and emergency call system and more application-related information. These messages are often broadcast immediately to all or any other vehicles within the communication range and may be stored, evaluated and transmitted to them.

One of the similar systems is “emergency call” shortly named as "e-call", has been made compulsory in all new vehicles sold within the EU as of April 2018 in Europe. During this system, when the vehicle is involved in an accident, the vehicle automatically calls the police and the ambulance and transfers all the info to the opposite party. Life-threatening passengers are often reached more quickly with this way. This global system received simultaneous circuit with Europe, "Information and Communication Technologies Authority" (BTK), for vehicles to be imported to Turkey, local sim cards and personal server obligation are brought, due to this technique is found risky concerning data transfer. Due to this situation, a new generation of cars with this feature was blocked for last two years in Turkey.

“First, vehicles are provided to collect detailed information to facilitate more detailed services (such as traffic management, anti-theft system or smart insurance pricing applications) about their environment and their own situation. Secondly, vehicles will become truly autonomous, intelligent items that can realize a decentralized event-based business logic" (Haller et al., 2009).

"ICV (smart connected vehicle) applications transform vehicles not only being just physical movement vehicles but also to being mobile living spaces and digital screen." (Xu Kuang, et al., 2017). Smart cars implement more functions and services than traditional ones and that they expand the value chain. On the one hand, because of automatic driving technology, in-car applications like freedom of movement, mobile office, social media and entertainment are improved and used more frequently.

Smart vehicles connect with other objects (things), including catering, tourism, logistics and home via IoT. Services such as online booking, travel advice, smart logistics management and smart home control are all accessible from the vehicle via IoT. Marketing also must draw a replacement path within the light of those developments.

ICV can collect user information and vehicle operating data which will be used for sensitive marketing with big data analysis tools. Automobile companies can draw customer portraits and deliver advertisements supported data covering their owners' information, consumption habits, driving habits, vehicle conditions, etc. During this way, marketing costs are expected to decrease and brands can create more loyalty among customers (Xu Kuang et al., 2017). This survey was looked for the effects of Industry 4.0 on marketing strategy of Turkish Auto Industry and according to marketing strategy, it had been also looked for the change of marketing costs alongside marketing strategy.

2.4 IoT from Marketing View

"To achieve such improvements, IoT systems and Cyber-Physical Systems (CPSs) are essential because they permit the gathering, processing and storage of knowledge obtained in real-world objects"(T. M. Fernández et al., 2018) . Additionally, such systems can find and track related items within the factory information system, supplier system, customer data as well as marketing and sales data systems, in order that they can exchange data.

However, it is possible with IoT that Industry 4.0 devices can communicate autonomously among themselves and coordinate with one another and with other remote systems on the web.

According to the blog of i-scoop via internet, IoT affects all industries rapidly virtually. IoT is the interconnectivity of our digital devices such a way that gives endless opportunities for brands to concentrate and answer the requirements of their customers- with the right message, at the right time, on the right device. And it is expected that by 2020, the worldwide marketplace for IoT solutions are going to be $7.1 trillion. It is estimated that IoT connected devices are going to be +13 billion by 2020. And i-scoop also gives a view that the marketing power of the Internet of Things is connectivity for better customer interactivity (I-Scoop, 2020).

There are two main elements to know the IoT regarding IBM. These are new generations of IoT and big data. IBM called the future generation of IoT as Cognitive IoT. IBM said that Cognitive IoT technologies will make it possible for business leaders to know what is happening within the world more deeply and comprehensively and it will make the items or businesses operate more efficiently and therefore the business leaders could better cope with the activities during the business processes.

Businesses need samples like natural language processing, machine learning and video, image and text analytics. These quite new technologies help the marketing managers understand what is actually happening and what the particular needs from the purchasers are via data produced by machine learning algorithms (IBM, 2015).

There is no clear definition for “Big Data”. It is defined supported a number of its characteristics. There are three characteristics are often won’t to define big data. They are volume, variety and velocity regarding with IBM (IBM, 2015).

Consumer behavior and preferences, such as customer movements, transactions, product searches in the store or online website, are understood by analyzing big data. With big data, data-driven decision making is faster and more accurate. Big data helps greater confidence lower costs and generate more revenue, reduce risk and predict future results (Gong, 2016).

On the other hands, A World Economic Forum report published in September 2015 identified 21 tipping points. Tipping point means that the moments when specific technological shifts hit mainstream society. They will shape our future digital and hyper-connected world (World Economic Forum, 2015). All are expected to take place over the next 10 years, thereby witnessing the profound changes triggered by the fourth industrial revolution.

According this report, one of the tipping points is IoT (Internet of Things). Experts suggest that, within the future, every (physical) product can be connected to communication infrastructure, and sensors everywhere will allow people to completely perceive their environment. Some of the advantages and disadvantages of IoT are:

Advantages of IoT

– Increased effective usage in resources

– Lower cost of transportation

– Safety foods

– Things are going to be understood their environment and react accordingly

– Additional value supported connected "smart" things

- Vehicles produces with more sensors

Disadvantages of IoT

– Privacy

– Job losses

– Hacking, lesser security

- Selling data

– Cars, machines and roads infrastructure with higher utilization

The other tipping point is Smart Cities. Many cities will connect services, utilities and roads to the online. These smart cities will manage their energy, material flows, logistics and traffic. Some progressive cities are already implementing many new data-driven services, including intelligent parking solutions, smart garbage collection and intelligent lighting. Therefore, these systems can be used while the selling and marketing of the vehicle.

The other tipping point is Driverless Cars. Trials of driverless cars from large companies like Audi and Google are already getting involved. These vehicles can potentially be more efficient and safer than cars with people behind the steering wheel. Moreover, they might reduce congestion and emissions, and extend their existing models for transportation and logistics. It now suggests that the selling and marketing of the vehicle will be made on this technology.

Tesla cars were sold over the last year in the US semi-autonomous via a software update in October 2015. Two hackers demonstrated their ability to hack into a moving car, controlling its dashboard functions, steering, brakes and radio within the summer of 2015 (Wired, 2015). That is concerned with the ethical aspects of technology.

2.5 TOE Framework Review

Technology has changed the world dramatically as mentioned in above sections (Wook Ok, 2017) and some new concepts have been introduced accordingly to the technology throughout the end of 20th of century and the beginning of 21st century. One of these concepts is Technology-organization-environment (TOE). Additionally, to the terms like IoT, TOE term is another concept that has been introduced couple of years ago and both adopted by business world and business literature.

Technology-organization- environment concept, defined three factors of a business context that affect the process that adopts and ensures innovation of technology: firstly, the organizational context, secondly technological context, and finally environmental context. Organizational context explains business size; centralization, formalization, and complexity of its management structure.

Technological context defines all the internal and external technologies related to the business which also means existing technologies within the firm, as well as the range of available technologies in the market. Environment context is the field that a business operates its business industry, competitors, access to resources supplied by others, and dealings with government (Tornatzky and Fleischer, 1990).

The technology–organization–environment (TOE) framework is described in DePietro and Fleischer’s The context for change: Organization, Technology and Environment (1990). The book, together with the innovations made by engineers and entrepreneurs, explains the entire innovation process ranging from a company to users' adoption and implementation.

The TOE framework is an organization-level theory that explains that three different elements of a firm's context affect compliance decisions. These are the technological context, organizational context and therefore environmental context. All three are expected to affect technological innovation. (Baker, 2012).

The technological dimension focuses on the technological features that affect the adoption of the organization, the organizational dimension focuses on the adoption of organizational features, and finally the environmental dimension focuses on the elements that cover the company (Henderson et al., 2012). The advantage of the TOE framework is that it is a simple empirical application that gives a robust theoretical background and useful guidance for researchers.

Researchers are to apply TOE framework to research the adoption of varied technologies. Maduku et al. (2016) suggested that competitive pressure, complexity, top management, relative advantage, financial resource, cost reduction, employee capability, customer pressure had a big positive impact on mobile marketing supported the TOE framework. Saldanha and Krishnan (2012) found that enormous firms have a far better degree of adoption and firms in highly knowledge-intensive and innovation-intensive industries have a far better degree of adoption. Saldanha and Krishnan (2012) also suggested that organization size and industry knowledge play important roles in Web 2.0 technology adoption. Figure 2 illustrates the proposed research model named as TOE.

Chapter 3

Conceptual Framework

The methodology approach of the study is predicated on the theoretical and methodological research of the contemporary marketing literature and therefore the conclusions of the questionnaires of auto brand managers. This study is predicated on an exploratory research utilizing case study method. Questionnaires administered with 37 automobile brand managers in Turkey. Data are analyzed with descriptive analysis.

The research method utilized in the study was analyzed by sampling using the questionnaire as a data collection tool. It includes closed questions, measured with a nominal and Likert scale. 61 managers provided complete and useful answers to the present research. The collected data were analyzed with the Statistical Package for the Social Sciences (SPSS) software using with reliability index, frequency tables and factor analysis, PCA (Principal Component Analysis) and regression analysis (ANOVA).

3.1 Research Model and Hypotheses

Internet of Things (IoT), market growth and cost reduction are the dependent variables of this study. Transport routes & infrastructure, one-to-one marketing, sales point, car cost, government policies are independent variables of this study. According to the research model, all seven independent factors affect IoT, market growth and cost reduction directly. Figure 3 illustrates the research model.

3.2 Research Model and Proposed Research Model (TOE)

It has been used the TEO framework for this study as a proposed research model. TOE framework is an organization-level theory that explains that three different elements of a firm's adoption decisions. These three elements are the technological context, the organizational context, and finally the environmental context. All three are posited to influence technological innovation (Baker, 2012).

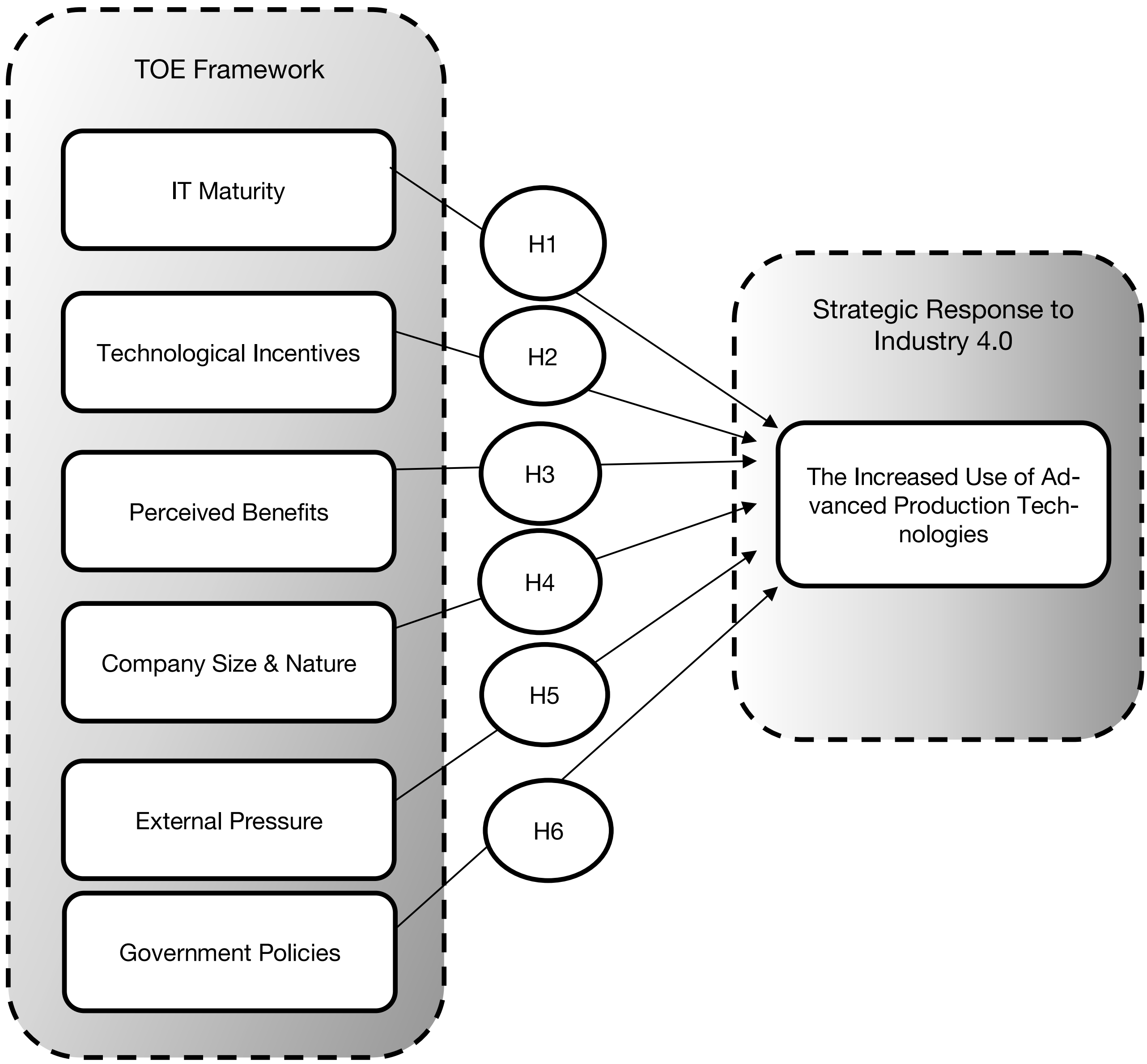

Figure 2 Proposed Research Model (TOE)

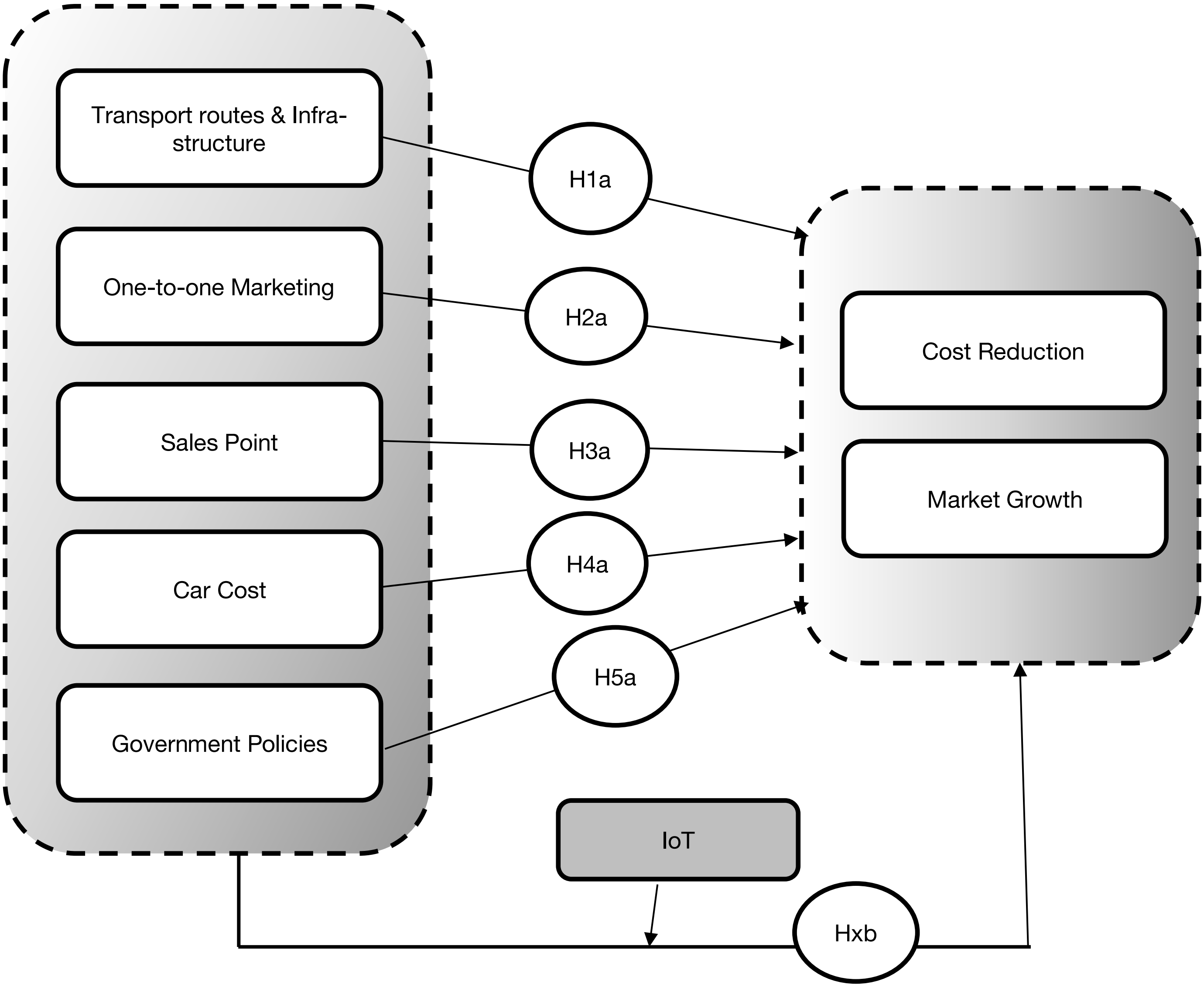

Figure 3 Research Model

3.2.1 Technological Dimension

The technological context includes all technologies related to the firm - that is, it includes technologies that are already in use at the firm and also used by humans, but are not currently used. The process of adopting existing technologies for a firm is also important because it sets a broad limit on the scope and speed of technological change that a firm can undertake (Baker, 2012).

The applying of Industry 4.0 stands out with the transition from traditional production to the utilization of advanced industrial applications, as in previous industrial periods. The fourth industrial revolution has created an unprecedented breakthrough in innovation with the mixing and convergence of existing advanced technologies (Kagermann, 2015). The uninterrupted connection of physical objects in the embedded system, due to the Internet of things (IoT) and services, has helped to realize the newest situation on the web. In keeping with the proposed research model, internet of thing (IoT) and transport route & infrastructure are the technological dimension of TOE framework.

3.2.2 Organizational Dimension

The organizational context refers to the characteristics of the organization, which includes the structures among the employees, the internal communication, the organization size, and therefore the amount of resources. There are several ways that this context can affect compliance and enforcement decisions (Baker J., 2012).

Organic and decentralized organizational structures are related to adoption. Organizations with such structures highlight teams and also ensure that workers are to some extent responsible for their responsibilities, and support lateral communication in addition to communication along the reporting lines.

The size of the company is related to its available resources, its capacity to understand and implement innovation (Lin, 2018). Many studies confirm that institutional dimensions are one of the major indicators in the adoption of the latest technologies. Because it enables larger companies to have more incentives, new resources, skills and experience as a more positive risk attitude to adopt new technology. In line with the proposed research model, one-to-one marketing, sales point and sales cost are the organizational dimension of TOE framework.

3.2.3 Environmental Dimension

The environmental context includes the structure of the industry, the presence and absence of technology service providers, and hence the regulatory environment. The industrial structure can be explored in several ways. For example, intense competition promotes the creation and adoption of innovation. In addition, dominant companies in the value chain influence other value chain partners to innovate. (Baker, 2012).

In a highly competitive market, such as automobile manufacturing, companies have to either adapt to new technology or adapt to respond to customer demand. (Lin, 2018). When the environment changes, the power of firms to modify from a previous situation to a more appropriate management strategy greatly affects firms' performance. The automobile industry, an advanced representative of recent production, has become a pioneer in implementing Industry 4.0 within the countries with an outsized manufacturing sector, like Germany or China. According to the proposed research model, government policies are the environmental dimension of TOE framework.

3.3 Hypotheses

The hypotheses are being proposed according to the research model in Figure 3.

H1a : The predicted theoretical and practical developments in the local electronic highway systems will directly and positively affect "cost reduction" and "market growth". Yerel elektronik otoyol sistemleri faktörünün "cost reduction" ve "market growth" üzerinde doğrudan ve pozitif yönde etkisi vardır.

H1b : The predicted theoretical and practical developments in the local electronic highway systems via IoT will directly and positively affect "cost reduction" and "market growth". Yerel elektronik otoyol sistemleri faktörünün IoT üzerinden "cost reduction" ve "market growth"a dolaylı ve pozitif yönde etkisi vardır.

H2a : Intensive usage of one-to-one marketing factor will directly and positively affect "cost reduction" and " market growth". Bire bir pazarlama faktörünün "cost reduction" ve "market growth" üzerinde doğrudan ve pozitif yönde etkisi vardır.

H2b : Intensive usage of one-to-one marketing factor via IoT will indirectly and positively affect "cost reduction" and " market growth". Bire bir pazarlama faktörünün IoT üzerinden "cost reduction" ve "market growth"a dolaylı ve pozitif yönde etkisi vardır.

H3a : Predicted evolving of the sales point factor will directly and positively affect "cost reduction" and "market growth". Satış noktaları faktörünün "cost reduction" ve market growth" üzerinde doğrudan ve pozitif yönde etkisi vardır.

H3b : Predicted evolving of the sales point factor via IoT will indirectly and positively affect "cost reduction" and "market growth". Satış noktaları faktörünün IoT üzerinden "cost reduction" ve market growth"a dolaylı ve pozitif yönde etkisi vardır.

H4a : The gradual increase in vehicle production cost factor will directly and positively affect "cost reduction" and "market growth". Araç üretim maliyetleri faktörünün "cost reduction" ve "market growth" üzerinde doğrudan ve pozitif yönde etkisi vardır.

H4b : The gradual increase in vehicle production cost factor via IoT will indirectly and positively affect "cost reduction" and "market growth". Araç üretim maliyetleri faktörünün IoT üzerinden "cost reduction" ve market growth"a dolaylı ve pozitif yönde etkisi vardır.

H5a : Predicted incentives and tax benefits in government policies will directly and positively affect "cost reduction" and "market growth". Devlet politikaları faktörünün "cost reduction" ve "market growth" üzerinde doğrudan ve pozitif yönde etkisi vardır.

H5b : Predicted incentives and tax benefits in government policies via IoT will indirectly and positively affect "cost reduction" and "market growth". Devlet politikaları faktörünün IoT üzerinden "cost reduction" ve "market growth"a dolaylı ve pozitif yönde etkisi vardır.

Chapter 4

Methodological Framework

4.1. Aim & Objectives

“As the new generation industry becomes important for the modern economy, a new approach is required for the marketing organization. The new industry, called Industry 4.0, is the result of not only the development of the latest technologies, but also the new entrepreneurial mind” (Sterev, 2017).

Industry 4.0 is the result of the economic policies of developed countries, with the impact of innovation, entrepreneurship and human capital elements of the current business culture. A new innovative and entrepreneurial mindset needs an innovative marketing approach (Sterev, 2017). This innovative marketing approach needs an innovative marketing strategy as well. This is the main starting point of the thesis.

Industry 4.0 is used to clarify the digitalization of industry that is supported new communication technologies and supported Internet technologies. These communication technologies change the manufacturing inside as a good spread of data, of Internet of things (IoT) have arose new opportunities for the auto business.

The purpose of this study is to work out what is being researched thus about the effects of Industry 4.0 to auto marketing strategy, and its impact on the changes and adoption in marketing firms. To realize this objective, an intensive review of journal articles, books, conference papers were performed.

Since the subject of the study is relatively new and relevant, it was important to review the literature in Internet 4.0 and IoT to highlight the latest technology and conduct further research. To supply an intensive bibliography of the academic literature on Industry 4.0 and automobile marketing strategy, the following available online databases were searched: Google Scholar, Web of Science, EBSCOhost, ProQuest, ScienceDirect, Scopus, and ULAKBIM and tez.yok.gov.tr. Figure 4 shows the research approach.

Figure 4 Research Approach

4.2 Research Methodology

As mentioned in Second Section, it's been used the TEO framework for this study as a search model. TOE framework describes how the organization context influences the adoption and implementation of innovation from three different dimensions as technology, organization and environment (DePietro and Fleischer, 1990). Items for survey measurement have been adopted from the literature, as discussed in Second Section, with the questionnaire developed using a seven-point Likert scale. The reason for using a Likert scale is that Likert scale has been widely confirmed as an appropriate tool for questionnaire surveys (Lin, 2018).

The research method utilized in the study was analyzed by sampling using the questionnaire as a data collection tool. It includes closed questions, measured with a nominal and Likert scale. 61 managers provided complete and useful answers to the present research. The collected data were analyzed with the Statistical Package for the Social Sciences (SPSS) software using reliability index, frequency tables, contingency tables and factor analysis, PCA (Principal Component Analysis) and regression analysis (ANOVA).

4.2.1 Sampling and Data Collection

The target population of this study is senior brand managers within the automobile companies who are responsible of marketing, selling. These companies are obtained from the web site of Otomotiv Distribütörleri Derneği (known as ODD), which means the association of automotive distributors. So, a preliminary list of 43 automotive companies that have main offices in Istanbul is ready, then their potential contacts for this research was obtained through the web site of ODD.

However, three brands out of 43 have not being sold in Turkey anymore; they are only registered in ODD website on the date of this survey. At the same time, the other three brands are commercial vehicles, therefore they were not included to the present survey as well. So, 37 auto brands were included to this survey. These brands are mentioned in Section 4.2.2.

In order to avoid small sampling problem in SPSS statistical software, questionnaire forms were sent to two managers in each automobile brand. In other words, additionally to brand managers, sales or marketing managers also are included during this survey. Accordingly, The questionnaire was returned from 61 managers.

A survey instrument was developed to research the hypotheses. The questionnaires were designed through discussions with academicians and experts from automotive companies. The fact that the person who prepared this study has 25 years of automotive experience also contributed to the survey.

44 related questions were finalized using the seven-point Likert scale. 11 questions are related with demographic. So, the total questions asked to the participants at questionnaire form is 55. All the questions and items were presented both in English and Turkish to decrease any misunderstanding, and questionnaire form was built on googleform.com , a professional questionnaire website. The e-mail is sent to the participants to tell about the aim of this study and therefore the data collected are mainly for research only. Then, the online questionnaire website link was sent to guide targeted participants to fill out the survey. At the end of the day, a total number of 61 returns were received out of 37 auto brand managers , of which 61 questionnaires were valid with a response rate of 82 percent. The number of brands responded was 31, which are Alfa Romeo, Audi, BMW, Citroen, Fiat, Ferrari-Maserati, Ford, Honda, Hyundai, Infiniti, Jaguar, Kia, Lexus, Dacia, Renault, Mazda, Mercedes, Mini, Mitsubishi, Nissan, Opel, Peugeot, Porsche, Seat, Skoda, Smart, Subaru, Suzuki, Toyota, Volvo, VW. A total number of five auto brand managers were not responded to the questionnaire form. They are DS Auto, Jeep, Aston Martin, Land Rover, Bentley and Maserati. Ferrari and Maserati brands are managed by one person, and one person answered the questionnaire, so the names of the two brands were used under one questionnaire form. The participants are mentioned in section 4.2.2.

4.2.2 The Population of the Study

At the time of this survey, 43 automotive companies are registered in ODD. Each one has its own brand manager. Ferrari and Maserati brands are managed by one person, and one person answered the questionnaire, so the names of the two brands were used under one questionnaire form.

DFSK, Chery, Lancia brands have not been sold in Turkey anymore; they are only registered in ODD website. However, Otokar, Iveco, Ssangyong brands are commercial vehicles, therefore they are not included to this survey as well. So, 37 auto brands are included to this survey. The brands are listed from a to z :

Alfa Romeo, Fiat, Ferrari, Maserati, Ford, Lancia, Jeep- Koç Tofaş A.Ş.

Aston Martin- D ve D Motorlu Araçlar A.Ş.

Audi, VW, Seat, Skoda, Porsche, Bentley -Doğuş Otomotiv A.Ş.

BMW, Jaguar, Land Rover, Mini- Borusan Otomotiv A.Ş.

Chery - Mermerler Otomotiv A.Ş.

Citroen, Infiniti, Subaru- Bayraktar Otomotiv A.Ş.

Dacia, Renault- Oyak Mais Otomotiv A.Ş.

Honda-Honda Türkiye A.Ş.

Hyundai- Hyundai Assan A.Ş.

Iveco- Iveco Araç A.Ş.

Kia- Çelik Motor A.Ş.

Mazda- Mazda Motors

Mercedes, Smart- Mercedes Türk A.Ş.

Mitsubishi- Temsa Motor A.Ş.

Nissan- Nissan Otomotiv A.Ş.

Otokar- Otokar Otomotiv A.Ş.

Peugeot, Opel, DS Auto- Groupe PSA

Suzuki- Doğan Holding A.Ş.

Ssangyong, DFSK- Şahsuvaroğlu Ltd.

Toyota, Lexus- Toyota Türkiye

Volvo- Volvo Otomobil Ltd.

The name mentioned beside the brand is the distributor or producer of the related brand.

In order to avoid small sampling problem in SPSS statistical software, questionnaire forms were sent to two managers in each automobile brand. In other words, in addition to brand managers, sales or marketing managers are also included in this survey. Accordingly, The questionnaire was returned from 61 managers.

4.3 Questions and Research Variables

The questionnaire form consists of 9 sections. After demographic questions in the introduction part, it was being started with Industry 4.0 at first section and continuing with one-to-one marketing section. Third Section was considered for transport routes& infrastructure section whereas fourth section was included questions regarding with car cost. Then sales point questions were continued by fifth section. Sixth section was included IoT (internet of things) questions and then government policies were continued at seventh section. Eighth Section involves with cost reduction and ninth section involves with market growth.

Likert scale was being used for the questions. Respondents were asked their level of agreement or disagreement on a 7-point scale where “7” implies total agreement and “1” implies total disagreement. The abbreviations for the variables used in SPSS statistical software are showed in Table 2.

The questionnaire sections are listed as below:

Demographic

Section 1 : Industry 4.0

Section 2 : One-to-one Marketing

Section 3 : Transport Routes& Infrastructure

Section 4 : Car Cost

Section 5 : Sales Point

Section 6 : Internet of Thing (IoT)

Section 7 : Government Policies

Section 8 : Cost Reduction

Section 9 : Market Growth

The questionnaire form is added as Appendix 1. The categorization of questionnaire form and the number of questions is illustrated in Table 3.

Categorization	**Number of Questions**	**The abbreviations for the variables used in SPSS**
Demographic	6	
Industry 4.0	5	
One-to-One Marketing	6	oto_FACTOR
Transport Routes & Infrastructure	4	transport_FACTOR
Car Cost	3	cost_FACTOR
Sales Point	5	sales_FACTOR
Internet of Thing (IoT)	14	IoT_FACTOR
Government policies	4	gov_FACTOR
Cost Reduction	4	cr_FACTOR
Market Growth	4	market_FACTOR

Table 3 Categorizations of Questionnaire Form and The Abbreviations for the Variables Used in SPSS software

Chapter 5

Result and Discussion

Before reviewing the results of SPSS, the similar study of this research from the literature is mentioned below.

According to the study of Otakar Ungerman et al., (2018), the outputs from the questionnaire survey were subjected to a content analysis that was participated in by marketing experts that focus on the implementation of Industry 4.0 in an organization. The result consists of 11 impacts which are described because the major impacts of applying marketing innovation. 50 firms were involved within the research. The automobile industry in Czech Republic, which is additionally reflected during this survey, where 21 firms are within the automobile field.

The impacts presented in Table 4 are ranked by the average value from the most important to the least important. It is clear from the results of the survey that the respondents consider all of these impacts to be quite significant. The arithmetic means of assessing the importance of individual impacts varies from 4.0 to 5.1, and is therefore very high in all cases. A comparison of automobile and other industries shows that the average impact assessment is higher within the automobile industry than in the others.

This survey showed that automobile firms generally consider the impacts of innovative marketing and Industry 4.0 as more important than firms in other industries, and match more closely on impact ratings.

According to the results of the research carried out by Otakar Ungerman, when 11 impacts of Industry 4.0 on marketing are listed in order of importance, sales point, car cost and market growth factors are the most important issues for automobile companies. These factors numbers are 8 as sales point, 5 as car cost and 1 as market growth, they are shown in Table 4 as well. These factors also stand out in this research.

		0-250 employees, n=20		Automotive n=21	
No.	**Impacts**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**
1	Building PR, growth in business value	4.8	0.31	5.0	0.17
2	Higher demands on employees	4.0	0.25	5.3	0.13
3	Improving communication with customers	4.6	0.16	4.8	0.29
4	Increasing competitiveness	5.0	0.20	5.7	0.08
5	Change in the amount of costs	4.6	0.29	4.5	0.29
6	Entering new markets	3.6	0.34	4.7	0.31
7	Increasing productivity of work	4.6	0.20	5.1	0.16
8	Changing distribution channels	3.7	0.35	4.2	0.30
9	Improving the quality of products	4.5	0.11	4.6	0.27
10	Changes in strategic planning	4.0	0.20	5.2	0.14
11	Changing the corporate culture	5.5	0.15	4.6	0.26

Table 4 The Effect of Classification of Respondents' Answers to The Questions

"Firms aim to maximize their profits in order to survive within the market against their competitors. So as to realize this, they need to either cut their costs or increase their market share" (Cyert, et al. 1963). Accordingly, the marketing strategy are often built on these two items. In the proposed research model of this survey, the marketing strategy is predicated on these two items. However, the possibility of an intermediate or regulatory effect of IoT was also evaluated.

General reliability analysis for all questions was performed by SPSS. It had been observed that there was no problem. Reliability analysis was performed for the individual sub-dimensions as well. The Sales Point scale came at the complete limit, the others were quite higher.

Factor analyzes and rotations of variables were performed by SPSS. A total of three questions, one in the Cost Reduction, one within the Sales Point and one within the Government Policies dimensions, dropped down due to the factor could not loaded. These questions were likely confused in the mind of the respondents.

All independent variables were measured on two dependent variables according to the correlation matrix. The effects of all independent variables on IoT were examined. The effect of all independent variables (IoT) on dependent variables was examined. IoT factor seems to have no intermediate or regulatory effects.

In regression analysis, Sales Point directly affects the Market Growth. Other variables have little effects. Only the Government Policies factor has some influence, but less than the other factor. On Cost Reduction, almost no factor other than the Government Policies factor makes sense.

The abbreviations for the variables used in SPSS statistical software are showed in Table 3.

Table 5 shows the profile of respondents. It is found that the majority of respondents are in their early middle age (49%), have at least bachelor degree education (65%) and have working experience of more than 15 years (67%). Most of the respondents (83%) are working in the sales/marketing department. These findings indicate that respondents have knowledge of the advanced techniques and they are capable to answer the questions about Industry 4.0. In addition, it was found that female accounts for 19,6% of total responses.

It is found that the field of business are 82% distributors. And, the percentage of national firms is 65% and the percentage of international firms is 35%.

Demographics	***n***	**%**	**Demographics**	***n***	**%**
Gender			*Working experience*		
Male	49	%80,1	5-10	2	%3,2
Female	12	%19,6	10-15	18	%30
			15	41	%67
Department					
Marketing	10	%16,3	*Age*		
Sales/Marketing	51	%83	<40	25	%40,9
			40-50	30	%49
Title			50>	6	%0,1
Manager	41	%67			
Senior Manager	20	%32	*Field of Business*		
			Producer	11	%18

Demographics	*n*	%	Demographics	*n*	%
Educational level			Distributor	50	%82
Undergraduate	40	%65			
Postgraduate	21	%34	Boundaries of Activity		
			National	40	%65
			International	21	%35

Table 5 Profile of Respondents

To test the assumptions of the factor analysis, the multiple regression analysis was applied using IBM SPSS 22.0 software. A reliability test was performed on six variables. "The aim of reliability test was to measure the dependability of the questionnaire results for further analysis, especially the internal consistency of the research" (Lin D., 2018).

According to the research model, the hypotheses and related factors are showed in Figure 5.

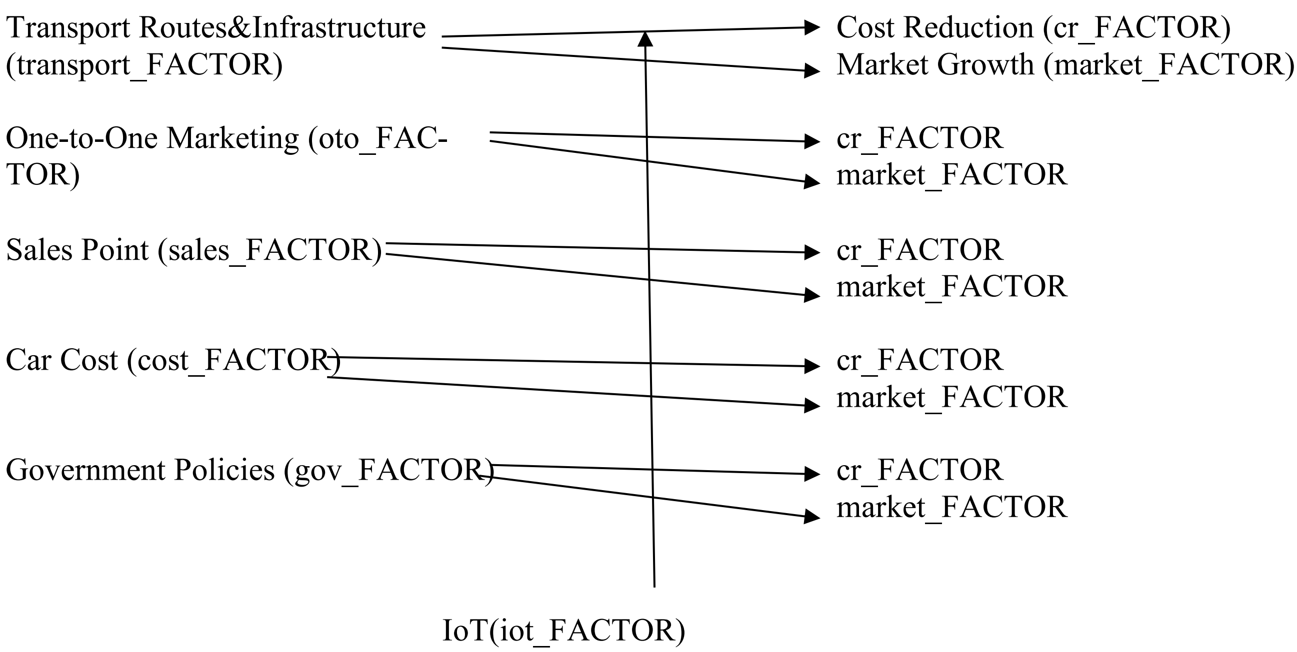

Figure 5 Factors Mentioned in SPSS Software

Cronbach's α coefficient test was chosen to assess the reliability of the data. As shown in Table 6, Cronbach's αs for all variables were above 0,70, which ensures that the consistency level of all investigated items is reliable.

Sekaran et al., (2011) shows that the threshold value for reliability analysis is 0,700 and the scales above this value are reliable. When the results of the research are evaluated within this framework, it is seen that all the sub-dimensions in the research are above this threshold value. Thus, other analyzes were started without leaving any academic suspicion.

The Sales Point scale came at the complete limit, the others were quite higher. It is 0,695. But the others are above 0,70.

Variables	One-to-One Marketing	Transport Routes& Infrastructure	Car Cost	Sales Points	IoT	Government Policies	Cost Reduction	Market Growth
Cronbach's Alpha	0,911	0,753	0,810	0,695	0,800	0,747	0,748	0,830

Table 6 Cronbach's Alpha Value

Cronbach's Alpha is a measure of reliability that is a lower bound for the true reliability of the survey. The computation of Cronbach's alpha is supported the number of items on the survey and the ratio of the average inter-item covariance to the average item variance.

Alpha value of a scale to be accepted as reliable by Cronbach Alpha must be at least 0,70 level. Cronbach's alpha value of less than 0,70 scales are unreliable or unreliable scale. According to the results of SPSS software, the total value of the reliability of the survey is Alpha value was found as 0,965. It is understood that the research has high reliability because it is greater than $\alpha >$ 0,70. The Cronbach Alpha value is made for both all variables and all individual variables. All variables except for only sales are greater than $\alpha >$ 0,70.

Correlations

		oto_FACTOR	transport_FACTOR	cost_FACTOR	sales_FACTOR	iot_FACTOR	gov_FACTOR	cr_FACTOR	market_FACTOR
oto_FACTOR	Pearson Correlation	1	,855**	,699**	,688**	,722**	,637**	,481**	,671**
	Sig. (2-tailed)		,000	,000	,000	,000	,000	,000	,000
	N	61	61	61	61	61	61	61	61
transport_FACTOR	Pearson Correlation	,855**	1	,782**	,717**	,722**	,736**	,546**	,753**
	Sig. (2-tailed)	,000		,000	,000	,000	,000	,000	,000
	N	61	61	61	61	61	61	61	61
cost_FACTOR	Pearson Correlation	,699**	,782**	1	,721**	,802**	,814**	,589**	,745**
	Sig. (2-tailed)	,000	,000		,000	,000	,000	,000	,000
	N	61	61	61	61	61	61	61	61
sales_FACTOR	Pearson Correlation	,688**	,717**	,721**	1	,792**	,809**	,603**	,838**
	Sig. (2-tailed)	,000	,000	,000		,000	,000	,000	,000
	N	61	61	61	61	61	61	61	61
iot_FACTOR	Pearson Correlation	,722**	,722**	,802**	,792**	1	,841**	,613**	,792**
	Sig. (2-tailed)	,000	,000	,000	,000		,000	,000	,000
	N	61	61	61	61	61	61	61	61
gov_FACTOR	Pearson Correlation	,637**	,736**	,814**	,809**	,841**	1	,684**	,833**
	Sig. (2-tailed)	,000	,000	,000	,000	,000		,000	,000
	N	61	61	61	61	61	61	61	61
cr_FACTOR	Pearson Correlation	,481**	,546**	,589**	,603**	,613**	,684**	1	,803**
	Sig. (2-tailed)	,000	,000	,000	,000	,000	,000		,000
	N	61	61	61	61	61	61	61	61
market_FACTOR	Pearson Correlation	,671**	,753**	,745**	,838**	,792**	,833**	,803**	1
	Sig. (2-tailed)	,000	,000	,000	,000	,000	,000	,000	
	N	61	61	61	61	61	61	61	61

**. Correlation is significant at the 0.01 level (2-tailed).

Table 7 Correlations Matrix

According to the description in Research Methods for Business by Sekaran (2011), Pearson correlation matrix will indicate the direction, strength, and significance of the bivariate relationships among all the variables that were measured at an interval or ratio level.

According to the result of SPSS software, the Correlation Matrix is showed in Table 7. Pearson Correlation is a measure of linear association between two variables. Its values of the coefficient of correlation range from -1 to 1. The sign of the coefficient indicates the direction of the connection, and its measure quantity indicates the strength, with larger absolute values indicating stronger relationships. Correlation is significant at the 0,01 level (2-tailed).

Sig (2- tailed), the probability of obtaining results as extreme because the one observed, and in either direction when the null hypothesis is true. A two-tailed significance level tests a null hypothesis during which the direction of an impact is not specified in advance $p < 0{,}05$.

Since there is "sig (2-tailed) $p < 0{,}05$" in the correlation matrix, it indicates that there is a significant relationship among the variables. The line Pearson Correlation value, which shows the direction and strength of the relationship, was positive for all variables. Therefore, it shows that there is a positive strong relationship among all variables. The result obtained supports the hypotheses.

Pearson Correlation value of Transport Routes&Infrastructure is 0,855, it means it has quite higher correlation (0,855) among One-to-One Marketing and Transport routes& Infrastructure factors. IoT factor has a higher correlation with Sales Point and Car Cost. Government Policies factor has also higher correlation value with Car Cost, Sales Point and IoT factors. Market Growth has higher correlation value with Sales Point, Government Policies and Cost Reduction.

A Pearson correlation test was conducted to examine the feasibility to use multiple regression methods. The results of the Pearson correlation in Table 7 validate the mutual correlation of variables as significant at the 0,01 level.

Sekaran (2011) described regression analysis as provides a way of objectively assessing the degree and therefore the character of the relationship between the independent variables and therefore the dependent variable. The regression coefficients indicate the relative importance of each of the independent variables within the prediction of the dependent variable.

Each variable has a positive regression coefficient at a significance level less than 0,01, indicating that all the variables. Thus, H1a, H1b and H2a, H3b, H4a are rejected. The others H2b, H3a, H4b, H5a, H5b are confirmed.

Rejected hypotheses are:

H1a : The predicted theoretical and practical developments in the local electronic highway systems will directly and positively affect “cost reduction” and “market growth”.

H1b : The predicted theoretical and practical developments in the local electronic highway systems via IoT will directly and positively affect “cost reduction” and “market growth”.

H2a : Intensive usage of one-to-one marketing factor will directly and positively affect “cost reduction” and “ market growth”.

H3b : Predicted evolving of the sales point factor via IoT will indirectly and positively affect “cost reduction” and “market growth”.

H4a : The gradual increase in vehicle production cost factor will directly and positively affect “cost reduction” and “market growth”.

Confirmed hypotheses will be explained in step by step as following section.

In regression analysis, Sales Point directly affects the Market Growth. Other variables have little effect. Only Government Policies factor has some influence, but less than the other factors. On Cost Reduction, almost no factor other than the Government Policies factor makes sense. Thus, H1a, H1b and H2a, H3b, H4a are rejected. The others H2b, H3a, H4b, H5a, H5b are confirmed.

According to the coefficients table of the regression analysis, the significant value $p<0,05$ indicates that there are significant relationships among the variables.

The coefficients table of Cost Reduction Factor, p value for Government Policies is 0,037 that is less than $p<0,05$. There are significant relationships with only Government Policies. Except

Government Policies Factor hypothesis all other hypothesis has been rejected as their p value are higher than desired value of 0,05. Beta value of 0,483 represents a positive and intermediate level of effect.

Hence, Government Policies Factor has a significant and intermediate positive effect on Cost Reduction via IoT. So, H5a is confirmed. Related table is illustrated in Table 8.

Confirmed H5a hypothesis is as follows : Predicted incentives and tax benefits in government policies will directly and positively affect "cost reduction" and "market growth".

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,691[a]	,478	,420	,67105

a. Predictors: (Constant), gov_FACTOR, oto_FACTOR, sales_FACTOR, cost_FACTOR, iot_FACTOR, transport_FACTOR

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	22,281	6	3,714	8,247	,000[b]
	Residual	24,317	54	,450		
	Total	46,598	60			

a. Dependent Variable: cr_FACTOR
b. Predictors: (Constant), gov_FACTOR, oto_FACTOR, sales_FACTOR, cost_FACTOR, iot_FACTOR, transport_FACTOR

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1,730	,550		3,146	,003
	oto_FACTOR	-,016	,156	-,022	-,106	,916
	transport_FACTOR	,047	,204	,052	,231	,818
	cost_FACTOR	,032	,185	,035	,175	,862

sales_FACTOR	,086	,147	,109	,585	,561
iot_FACTOR	,072	,219	,071	,326	,746
gov_FACTOR	,475	,223	,483	2,134	,037

a. Dependent Variable: cr_FACTOR

Table 8 Regression Model, Dependent Variable: Cost Reduction via IoT

On the other hand, Government Policies Factor has a significant and intermediate positive effect on Cost Reduction without IoT. Hence, with and without IoT, there is positive effect on Cost Reduction from Government Policies. The related table is illustrated in Table 9.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	22,233	5	4,447	10,038	,000[b]
	Residual	24,365	55	,443		
	Total	46,598	60			

a. Dependent Variable: cr_FACTOR
b. Predictors: (Constant), gov_FACTOR, oto_FACTOR, sales_FACTOR, cost_FACTOR, transport_FACTOR

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1,796	,507		3,539	,001
oto_FACTOR	-,001	,147	-,001	-,004	,997
transport_FACTOR	,036	,199	,040	,180	,858
cost_FACTOR	,048	,177	,052	,274	,785
sales_FACTOR	,097	,143	,122	,680	,499
gov_FACTOR	,505	,201	,514	2,505	,015

a. Dependent Variable: cr_FACTOR

Table 9 Regression Model, Dependent Variable: Cost Reduction without IoT

According to the coefficients table of the regression analysis, the significant value p<0,05 indicates that there are significant relationships among the variables.

The coefficients table of Market Growth Factor, p value for Government Policies is 0,046 and p value for Sales Point is 0,002, both of them are less than p<0,05 value. There are significant relationships with Government Policies and Sales Point and Market Growth via IoT.

oto_FACTOR, transport_FACTOR, cost_FACTOR and iot_FACTOR hypothesis has been rejected as their p value are higher than the desired p value of p>0,05. Thus, H1a, H2a, H4a are rejected.

On the other hand, gov_FACTOR and sales_FACTOR has been confirmed as their p values as smaller than the desired p value of p>0,05, so, H5a and H3a are confirmed. Related table is illustrated in Table 10.

Confirmed H3a hypothesis is as follows: Predicted evolving of the sales point factor will directly and positively affect "cost reduction" and "market growth".

Confirmed H5a hypothesis is as follows: Predicted incentives and tax benefits in government policies will directly and positively affect "cost reduction" and "market growth".

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,890[a]	,792	,769	,54391

a. Predictors: (Constant), gov_FACTOR, oto_FACTOR, sales_FACTOR, cost_FACTOR, iot_FACTOR, transport_FACTOR

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	60,827	6	10,138	34,268	,000[b]
	Residual	15,975	54	,296		
	Total	76,803	60			

a. Dependent Variable: market_FACTOR

b. Predictors: (Constant), gov_FACTOR, oto_FACTOR, sales_FACTOR, cost_FACTOR, iot_FACTOR, transport_FACTOR

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,561	,446		-1,258	,214
	oto_FACTOR	-,062	,126	-,064	-,489	,627
	transport_FACTOR	,266	,165	,231	1,609	,114
	cost_FACTOR	-,011	,150	-,009	-,075	,941
	sales_FACTOR	,393	,119	,385	3,288	,002
	iot_FACTOR	,166	,178	,128	,932	,356
	gov_FACTOR	,369	,180	,292	2,044	,046

a. Dependent Variable: market_FACTOR

Table 10 Regression Model, Dependent Variable: Market Growth via IoT

There are significant relationships with Government Policies and Sales Point and Market Growth. The related table is illustrated in Table 11.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	60,570	5	12,114	41,047	,000[b]
	Residual	16,232	55	,295		
	Total	76,803	60			

a. Dependent Variable: market_FACTOR
b. Predictors: (Constant), gov_FACTOR, oto_FACTOR, sales_FACTOR, cost_FACTOR, transport_FACTOR

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,408	,414		-,985	,329
	oto_FACTOR	-,025	,120	-,026	-,208	,836

transport_FACTOR	,240	,163	,209	1,475	,146
cost_FACTOR	,026	,144	,022	,182	,856
sales_FACTOR	,417	,116	,410	3,589	,001
gov_FACTOR	,438	,164	,347	2,661	,010

a. Dependent Variable: market_FACTOR

Table 11 Regression Model, Dependent Variable: Market Growth without IoT

The coefficients table of IoT Factor, p value for Government Policies is 0,002 and p value for One-to-One Marketing is 0,18 and p value for Car Cost is 0,044, all of them are less than p<0,05 value. There are significant relationships among Government Policies, One-to-One Marketing and Car Cost.

oto_FACTOR and gov_FACTOR has been confirmed as their p values are smaller than the desired p value of p>0,05. Thus, H2b, H4b and H5b are confirmed.

Confirmed H2b hypothesis is as follows: Intensive usage of one-to-one marketing factor via IoT will indirectly and positively affect "cost reduction" and " market growth".

Confirmed H4b hypothesis is as follows: The gradual increase in vehicle production cost factor via IoT will indirectly and positively affect "cost reduction" and "market growth".

Confirmed H5b hypothesis is as follows: Predicted incentives and tax benefits in government policies via IoT will indirectly and positively affect "cost reduction" and "market growth".

transport_FACTOR and sales_FACTOR hypothesis has been rejected as their values are higher than the desired p value of p>0.05. H1b and H3b are rejected. Related table is illustrated in Table 12.

Rejected H1b : The predicted theoretical and practical developments in the local electronic highway systems via IoT will directly and positively affect "cost reduction" and "market growth".

Rejected H3b : Predicted evolving of the sales point factor via IoT will indirectly and positively affect "cost reduction" and "market growth".

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,892[a]	,795	,777	,41242

a. Predictors: (Constant), gov_FACTOR, oto_FACTOR, sales_FACTOR, cost_FACTOR, transport_FACTOR

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	36,314	5	7,263	42,699	,000[b]
	Residual	9,355	55	,170		
	Total	45,670	60			

a. Dependent Variable: iot_FACTOR
b. Predictors: (Constant), gov_FACTOR, oto_FACTOR, sales_FACTOR, cost_FACTOR, transport_FACTOR

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,920	,314		2,926	,005
	oto_FACTOR	,222	,091	,298	2,443	,018
	transport_FACTOR	-,156	,124	-,176	-1,265	,211
	cost_FACTOR	,226	,109	,246	2,066	,044
	sales_FACTOR	,149	,088	,190	1,692	,096
	gov_FACTOR	,415	,125	,427	3,327	,002

a. Dependent Variable: iot_FACTOR

Table 12 Regression Model, Dependent Variable: IoT

Principal Component Analysis was used for extraction method. According to the Total Variance Explained table of Market Growth, the initial eigenvalue of first component is 3,043, it means that first component could explain the Market Growth with 60%. The Total Variance Explained

Table of Market Growth is illustrated in Table 13. It could be said that the last three questions of Market Growth Section formed a group.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,638
Bartlett's Test of Sphericity	Approx. Chi-Square	140,338
	df	10
	Sig.	,000

Communalities

	Initial	Extraction
market1	1,000	,571
market2	1,000	,388
market3	1,000	,685
market4	1,000	,640
market5	1,000	,759

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3,043	60,863	60,863	3,043	60,863	60,863
2	,876	17,510	78,373			
3	,549	10,982	89,356			
4	,372	7,446	96,802			
5	,160	3,198	100,000			

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component
	1
market1	,755
market2	,623
market3	,828
market4	,800

market5	,871

Extraction Method: Principal Component Analysis.[a]

a. 1 component extracted.

Table 13 The Total Variance Explained Table of Market Growth

According to the Total Variance Explained table of Cost Reduction, the initial eigenvalue of first and second components are 2,635 and 1,143, it means that these components could explain the Cost Reduction with 75%. The Total Variance Explained Table of Cost Reduction is illustrated in Table 14.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,581
Bartlett's Test of Sphericity	Approx. Chi-Square	139,146
	df	10
	Sig.	,000

Communalities

	Initial	Extraction
cr1	1,000	,260
cr2	1,000	,387
cr3	1,000	,753
cr4	1,000	,792
cr5	1,000	,443

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2,635	52,702	52,702	2,635	52,702	52,702
2	1,143	22,851	75,554			
3	,831	16,625	92,179			
4	,247	4,950	97,128			
5	,144	2,872	100,000			

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component
	1
cr1	,510
cr2	,622
cr3	,868
cr4	,890
cr5	,665

Extraction Method: Principal Component Analysis.[a]
a. 1 component extracted.

Table 14 The Total Variance Explained Table of Cost Reduction

According to the Total Variance Explained table of One-to-One Marketing, the initial eigenvalue of first and second components are 5,041 and 1,273, it means that these components could explain the One-to-One Marketing with 78%.

The Total Variance Explained Table of One-to-One Marketing is illustrated in Table 15.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,718
Bartlett's Test of Sphericity	Approx. Chi-Square	464,993
	df	28
	Sig.	,000

Communalities

	Initial	Extraction
oto1	1,000	,712
oto2	1,000	,773
oto3	1,000	,916
oto4	1,000	,793
oto5	1,000	,940
oto6	1,000	,912
oto7	1,000	,449
oto8	1,000	,819

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5,041	63,010	63,010	5,041	63,010	63,010	4,022	50,275	50,275
2	1,273	15,915	78,925	1,273	15,915	78,925	2,292	28,649	78,925
3	,699	8,741	87,666						
4	,381	4,757	92,423						
5	,269	3,361	95,784						
6	,230	2,874	98,658						
7	,073	,908	99,565						
8	,035	,435	100,000						

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component	
	1	2
oto1	,788	
oto2	,872	
oto3	,944	
oto4	,861	
oto5	,542	,804
oto6	,785	,544
oto7	,546	
oto8	,904	

Extraction Method: Principal Component Analysis.[a]
a. 2 components extracted.

Rotated Component Matrix[a]

	Component	
	1	2
oto1	,830	
oto2	,803	
oto3	,887	
oto4	,853	
oto5		,968
oto6		,873
oto7	,669	
oto8	,758	

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.[a]
a. Rotation converged in 3 iterations.

Component Transformation Matrix

Component	1	2
1	,854	,520
2	-,520	,854

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Table 15 The Total Variance Explained Table of One-to-One Marketing

According to the Total Variance Explained table of Transport Routes& Infrastructure, the initial eigenvalue of first component is 2,331, it means that these components could explain the Transport Routes&Infrastructure with 58%.

The Total Variance Explained Table of Transport Routes& Infrastructure is illustrated in Table 16.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,517
Bartlett's Test of Sphericity	Approx. Chi-Square	81,792
	df	6
	Sig.	,000

Communalities

	Initial	Extraction
transport1	1,000	,628
transport2	1,000	,470
transport3	1,000	,522
transport4	1,000	,711

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2,331	58,276	58,276	2,331	58,276	58,276
2	,935	23,375	81,652			
3	,519	12,976	94,628			
4	,215	5,372	100,000			

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component
	1
transport1	,792
transport2	,686
transport3	,723
transport4	,843

Extraction Method: Principal Component Analysis.[a]

a. 1 component extracted.

Table 16 The Total Variance Explained Table of Transport Routes& Infrastructure

According to the Total Variance Explained table of Car Cost, the initial eigenvalue of first and second components are 3,543 and 1,498, it means that these components could explain the Car Cost with 72%. The Total Variance Explained Table of Car Cost is illustrated in Table 17. One question in the Car Cost dimension, dropped down due to the factor could not loaded. This question was likely confused in the mind of the respondents.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,668
Bartlett's Test of Sphericity	Approx. Chi-Square	250,532
	df	21
	Sig.	,000

Communalities

	Initial	Extraction
cost1	1,000	,495
cost2	1,000	,673
cost3	1,000	,755
cost4	1,000	,394
cost5	1,000	,571
cost6	1,000	,432
cost7	1,000	,223

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3,543	50,619	50,619	3,543	50,619	50,619
2	1,498	21,402	72,021			
3	,826	11,794	83,815			
4	,546	7,796	91,611			
5	,323	4,616	96,227			
6	,173	2,472	98,699			
7	,091	1,301	100,000			

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component
	1
cost1	,704
cost2	,820
cost3	,869
cost4	,628
cost5	,755
cost6	,657
cost7	

Extraction Method: Principal Component Analysis.[a]
a. 1 component extracted.

Table 17 The Total Variance Explained Table of Car Cost

According to the Total Variance Explained table of Sales Point, the initial eigenvalue of first and second components are 2.316 and 1.548, it means that these components could explain the Sales Point with 77%. The Total Variance Explained Table of Sales Point is illustrated in Table

18. One question in the Sales Point dimension, dropped down due to the factor could not loaded. This question was likely confused in the mind of the respondents.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,447
Bartlett's Test of Sphericity	Approx. Chi-Square	136,653
	df	10
	Sig.	,000

Communalities

	Initial	Extraction
sales1	1,000	,482
sales2	1,000	,449
sales3	1,000	,694
sales4	1,000	,579
sales5	1,000	,112

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2,316	46,314	46,314	2,316	46,314	46,314
2	1,548	30,957	77,271			
3	,743	14,868	92,139			
4	,258	5,158	97,297			
5	,135	2,703	100,000			

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component
	1
sales1	,694
sales2	,670
sales3	,833
sales4	,761
sales5	

Extraction Method: Principal Component Analysis.[a]

a. 1 component extracted.

Table 18 The Total Variance Explained Table of Sales Point

According to the Total Variance Explained table of IoT, the initial eigenvalue of first and second components are 2.903 and 1.310, it means that these components could explain the IoT with 84%. The Total Variance Explained Table of IoT is illustrated in Table 19.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,698
Bartlett's Test of Sphericity	Approx. Chi-Square	162,454
	df	10
	Sig.	,000

Communalities

	Initial	Extraction
iot1	1,000	,574
iot2	1,000	,522
iot3	1,000	,820
iot4	1,000	,534
iot5	1,000	,453

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2,903	58,053	58,053	2,903	58,053	58,053
2	1,310	26,203	84,256			
3	,383	7,659	91,915			
4	,214	4,279	96,194			
5	,190	3,806	100,000			

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component
	1
iot1	,758
iot2	,722

iot3	,906
iot4	,731
iot5	,673

Extraction Method: Principal Component Analysis.[a]
a. 1 component extracted.

Table 19 The Total Variance Explained Table of IoT

According to the Total Variance Explained table of Government Policies, the initial eigenvalue of first and second components are 2,542 and 1,193, it means that these components could explain the Government Policies with 74%. The Total Variance Explained Table of Government Policies is illustrated in Table 20. One question in the Government Policies dimension, dropped down due to the factor could not loaded. This question was likely confused in the mind of the respondents.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,572
Bartlett's Test of Sphericity	Approx. Chi-Square	122,976
	df	10
	Sig.	,000

Communalities

	Initial	Extraction
gov1	1,000	,424
gov2	1,000	,740
gov3	1,000	,773
gov4	1,000	,404
gov5	1,000	,201

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2,542	50,839	50,839	2,542	50,839	50,839
2	1,193	23,855	74,694			
3	,777	15,537	90,231			
4	,342	6,847	97,078			
5	,146	2,922	100,000			

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component
	1
gov1	,651
gov2	,861
gov3	,879
gov4	,635
gov5	

Extraction Method: Principal Component Analysis.[a]
a. 1 component extracted.

Table 20 The Total Variance Explained Table of Government Policies

A total of three questions, one in the Cost Reduction, one in the Sales Point and one in the Government Policies dimensions, dropped down due to the factor could not loaded according to the Factor Analysis. These questions were likely confused in the mind of the respondents.

Chapter 6

Conclusion and Limitations

6.1 Limitations

Intense competition and rapid changes in the market force companies to use and adapt advanced technologies to improve intelligent production. Industry 4.0 is the new trend in current automation and information exchange in automobile manufacturing technology. In addition, technological innovations used in driverless vehicles are realized with industry 4.0 and IoT (Internet of Things). These cases are outside the research and are beyond the boundaries of the research.

There are some limitations during this study. First, the highest growth rate and the similar application could not be taken into consideration and compare survey results headed for a single country between different countries with data on cases during this study that focuses on the skills of the automobile industry in Turkey. Second, because there is a sort brief history between industry 4.0 and automobile marketing strategy, the right quantitative analysis would be difficult right now to explain the economic effects in this new value chain, as the relevant market data is almost non-existent.

Therefore, for future research, an in-depth comparison of different automobile marketing strategies can be made for large countries such as the USA, the European Union and Japan, and can also explore future mobility and industry's key political and social factors.

However, this transformation has cooperation in both the manufacturing industry and the Internet business, which may create new challenges for future administrative and commercial movements.

Hence there are more questions needed to be discussed like the following:

What quite organization form or business model will dominate in automobile industry for the future? How will new entrants make marketing strategy to introduce their latest products and services that have never been considered before?

These related questions might be a study for the future research.

6.2 Conclusion

For the first time, such this research was conducted on marketing strategy with wide participation among the members of Automotive Distributors in Turkey (ODD members).

It was investigated for the first time that automobile marketing strategies have a significant relationship with the factors researched by this thesis.

As a marketing strategy, the thoughts of the brand managers were investigated in terms of market size and cost reduction. It was the first time that such this research was conducted among ODD members on Industry 4.0 and IoT.

Summary of the attitudes of the brand managers related with marketing strategies under the influence of industry 4.0 and IoT was given below.

Through a case study, this study has several practical and theoretical contributions attempting to fill this gap. First, supported a summary of Industry 4.0 and auto marketing, it was found out the conception and behavior changes in several sorts of automobile brands, awakening stakeholders to the transforming forces that are reshaping their business and organization. Second, these quite reshaping organization changes marketing strategy deeply. The usage rate of digital channels has increased positively in automobile marketing strategies. Third, the usage rate of one-to-one marketing has increased positively in automobile marketing. And, the number of dealerships has affected negatively such a way that transforming sales points to delivery points.

According to the research results, it is understood that government policies and sales points have a significant effect on market size. That is, when the government makes a positive change in taxes on automobiles, the market shares of brands increase positively. However, a positive increase in the number of sales points, namely authorized dealers, leads to a positive increase in the market share of the brand. In contrast, a change in government policies only affects on cost reduction. It can be said that no factor other than government policies has a significant effect on cost reduction.

One-to-one marketing has a significant impact on IoT. That is, the IoT usage rate will increase one-to-one marketing usage rate. Accordingly, there is a significant relationship between one-to-one marketing and transport routes & infrastructure. That is, if we use one-to-one marketing with IoT and transport routes & infrastructure, automobile sales will increase and the brand's market shares will increase accordingly. In addition, intensive use of one-to-one marketing will have a positive effect on reducing marketing costs.

It has been understood that there is a positive relationship between vehicle production costs and brand market size and cost reduction. So, when you reduce vehicle costs with the help of IoT, the brand's market share will increase and costs will decrease.

Industry 4.0 and IoT shows that we are entering a phase where we need to rethink what is expected or desired from every company and every person, with the help of internet-connected devices. For this reason, IoT technology creates completely new products, new marketing strategy, new services and new business models that promise profits in almost all industries.

“In previous years, it was mentioned about the use of Internet 2.0 for marketing purposes, but now we can say that we are entering a new marketing phase by using functions such as IoT and IoS, a new tool for CRM.” (Marolt et al., 2015). Thus, companies that produce smart vehicles are given the opportunity to provide direct consumer experience. Thanks to Industry 4.0, the consumer will be contacted directly and will provide evaluation; however, perceived values will ensure that the entire service group associated with the management of connected vehicles will focus on real customer value.

Industry 4.0 results in a rapid transformation on marketing strategies. At the editing phase of the thesis, Covid-19 outbreak affecting the whole world and Turkey, are affected negatively tourism and especially the automobile industry. Automobile dealers and services are closed and their employees have been taken to free administrative leave according to the decisions taken by the government in order to stop the epidemic. Accordingly, customers no longer have not preferred visit showrooms. As a result of these reactions, the usage rate of digital channels has been increased positively in automobile marketing strategies. Additionally, the frequency of using virtual media has been increased positively in after-sales.

Appendix

1. Questionnaire Form

Endüstri 4.0'ın Otomobil Pazarlama Stratejisi Üzerine Etkileri

Sayın Yönetici,

Bu anket formu, Işık Üniversitesi Sosyal Bilimler Enstitüsü'nde yürütülmekte olan "Endüstri 4.0'ın otomobil pazarlama stratejisi üzerine etkileri" isimli doktora tezinin araştırmasının deneysel kısmı ile ilgilidir. Bu araştırma çalışması tamamen akademik bir amaca yönelik olup, çalışmanın amacı; eğitim ve geliştirmeye şirketlerin verdiği önemle ilgili veriler elde ederek bu hususta anlamlı bilimsel sonuçlara ulaşabilmektir.

Gönderilecek cevaplar kesinlikle gizli tutulacaktır. Elde edilen sonuçlar işletme adı belirtmeksizin genel ve ortalama özellikler şeklinde, bu araştırmaya katılan şirketlerden arzu edenlere de gönderilecektir. Birbirine benzeyen ve tekrar gibi görünen sorular araştırma tekniği açısından sorulması sorunlu sorulardır. Dolayısıyla, bütün soruların cevaplandırılması, değerlendirmenin sağlıklı yapılabilmesi için büyük önem arz etmektedir. İlginiz için teşekkürlerimizi sunar, çalışmalarınızda başarılar dileriz.

Araştırma Sorumlusu : Prof.Dr. Murat Ferman Beykent Üniversitesi Rektörü

Araştırma Yapan : M.Korhan Haşmet (doktora öğrencisi)

* Required

1.İşletmenin Adı *

2.Faaliyet Alanının Sınırları *

Ulusal

Uluslararası

3.Faaliyet Gösterdiği Alan *

Üretici

Distribütör

4.Formu Dolduranın Adı Soyadı

5.Çalıştığı Departman *

Pazarlama

Satış/Pazarlama

6.Ünvanı / Statüsü *

Orta düzey yönetici

Üst düzey yönetici

7. Yaşı *

8.Cinsiyeti

Kadın

Erkek

9.Eğitim Durumu *

İlköğretim

Lise

Yüksekokul

Üniversite

Yüksek Lisans

Doktora

10.Toplam iş tecrübesi

1-5

5-10

10-15

15+

11.Bu iş yerinde toplam çalışma süresi *

1-5

5-10

10-15

15+

12.Endüstri 4.0 Otomobil Pazarlama Stratejisini olumlu yönde etkileyecektir. *

1. Tamamen katılmıyorum
2. Çoğunlukla katılmıyorum
3. Kısmen katılmıyorum
4. Ne katılıyorum ne katılmıyorum
5. Kısmen katılıyorum
6. Çoğunlukla katılıyorum
7. Tamamen katılıyorum

13.Endüstri 4.0 ile beraber pazarlama birebir pazarlamaya evrilecektir. *

1. Tamamen katılmıyorum
2. Çoğunlukla katılmıyorum
3. Kısmen katılmıyorum
4. Ne katılıyorum ne katılmıyorum
5. Kısmen katılıyorum
6. Çoğunlukla katılıyorum
7. Tamamen katılıyorum

14.Endüstri 4.0 ile otomobil pazarlama stratejilerinde birebir pazarlama daha yoğun kullanılacaktır. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

15.Endüstri 4.0 ile beraber pazarlama organizasyonunda eleman sayısında aşağı yönlü baskı olacaktır. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

16.Endüstri 4.0 ile beraber pazarlama harcamalarına yukarı yönlü baskı olacaktır. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

17.Pazarlama harcamalarının artması ile beraber firmaların pazar payları olumlu yönde etkilenecektir. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

18.Müşteri sadakat programlarının kullanım sıklığı olumlu yönde etkilenecektir. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

19.Bire bir pazarlamanın yoğun kullanılması ile beraber yeni müşteri sayısında olumlu yönde artış gösterecektir. *

1. Tamamen katılmıyorum
2. Çoğunlukla katılmıyorum
3. Kısmen katılmıyorum
4. Ne katılıyorum ne katılmıyorum
5. Kısmen katılıyorum
6. Çoğunlukla katılıyorum
7. Tamamen katılıyorum

20.Endüstri 4.0 ile beraber yerel elektronik otoyol sistemlerinde IoT kullanımı olumlu yönde artış gösterecektir. *

1. Tamamen katılmıyorum
2. Çoğunlukla katılmıyorum
3. Kısmen katılmıyorum
4. Ne katılıyorum ne katılmıyorum
5. Kısmen katılıyorum
6. Çoğunlukla katılıyorum
7. Tamamen katılıyorum

21.Yerel elektronik otoyol sistemlerinde öngörülen teorik ve pratik gelişmeler, bire bir pazarlamanın yoğun kullanımı olarak otomobil pazarlama stratejisini olumlu yönde etkileyecektir. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

22.Yerel elektronik otoyol sistemlerinde öngörülen IoT kullanım sıklığı ile beraber firmaların pazarlama harcamalarına yukarı yönlü baskı olacaktır. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

23.Yerel elektronik otoyol sistemlerinde öngörülen IoT kullanım sıklığı ile beraber firmaların pazar paylarında olumlu yönde artış olacaktır. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

24.Endüstri 4.0 ile beraber araç üretim maliyetleri kademeli olarak artacaktır. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

25.Araç üretim maliyetlerindeki kademeli artış, araç fiyatlarını kademeli olarak yükseltecektir. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

26.Araç üretim maliyetlerindeki kademeli artış, bire bir pazarlamanın yoğun kullanımını olumlu yönde etkileyecektir. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

27.Endüstri 4.0 ile beraber rekabet daha yoğun olacaktır. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

28.Firmalar bu rekabetten başarılı şekilde ayrışmak için pazarlama faaliyetlerini artıracaklardır. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

29.Rekabetin artması firmaların pazarlama harcamalarına yukarı yönlü baskı yapacaktır. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

30.Endüstri 4.0 ile beraber araç kar marjlarında aşağı yönlü baskı olacaktır. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

31.Endüstri 4.0 ile beraber bayi satış noktaları teslimat noktasına evrilecektir. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

32.Endüstri 4.0 ile beraber teslimat noktalarının sayısında olumlu yönde artış olacaktır. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

33.Satış noktalarının teslimat noktasına evrilmesi ile beraber firmaların pazarlama harcamalarına yukarı yönlü baskı olacaktır. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

34.Satış noktalarının teslimat noktasına evrilmesi ile beraber firmaların pazar payları olumlu yönde etkilenecektir. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

35.Teslimat noktalarındaki artış, pazarlama organizasyonundaki eleman sayısında aşağı yönlü baskı yapacaktır. *

1. Tamamen katılmıyorum
2. Çoğunlukla katılmıyorum
3. Kısmen katılmıyorum
4. Ne katılıyorum ne katılmıyorum
5. Kısmen katılıyorum
6. Çoğunlukla katılıyorum
7. Tamamen katılıyorum

36.IoT artan kullanımı, bire bir çevrimiçi pazarlamanın yoğun kullanımı olarak otomobil pazarlama stratejisini olumlu yönde etkileyecektir. *

1. Tamamen katılmıyorum
2. Çoğunlukla katılmıyorum
3. Kısmen katılmıyorum
4. Ne katılıyorum ne katılmıyorum
5. Kısmen katılıyorum
6. Çoğunlukla katılıyorum
7. Tamamen katılıyorum

37.IoT ile beraber birebir çevrimiçi pazarlama daha yoğun ve etkili kullanılacaktır. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

38.Karayollarında uygulanan IoT ile beraber birebir pazarlama daha yoğun ve etkili kullanılacaktır. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

39.IoT kullanımı artması ile beraber firmaların pazar payları olumlu yönde etkilenecektir. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

40.IoT kullanımı artması ile beraber firmaların pazarlama harcamalarına yukarı yönlü baskı olacaktır. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

41.Devlet politikalarında öngörülen teşvikler ve vergi avantajları ile birlikte, otomobil satış fiyatlarına aşağı yönlü baskı olacaktır. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

42.Devlet politikalarında öngörülen teşvikler ve vergi avantajları ile birlikte, firmaların pazarlama harcamalarına yukarı yönlü baskı olacaktır. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

43.Devlet politikalarında öngörülen teşvikler ve vergi avantajları ile birlikte, firmaların pazar payları olumlu yönde etkilenecektir. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

44.Devlet politikaları ve öngörülen teşvikler ve vergi avantajları ile birlikte, firmalar pazarlama faaliyetlerini IoT üzerinden yapma sıklığı olumlu yönde etkilenecektir. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

45.10 yıla kadar Endüstri 4.0 yerini, Endüstri 5.0 bırakacaktır. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

46.IoT kullanımı ile beraber firmamızın maliyet liderliği olumlu yönde etkilenecektir. *

1. Tamamen katılmıyorum
2. Çoğunlukla katılmıyorum
3. Kısmen katılmıyorum
4. Ne katılıyorum ne katılmıyorum
5. Kısmen katılıyorum
6. Çoğunlukla katılıyorum
7. Tamamen katılıyorum

47.IoT ile beraber pazarlama faaliyetlerindeki maliyetlere aşağı yönlü baskı olacaktır. *

1. Tamamen katılmıyorum
2. Çoğunlukla katılmıyorum
3. Kısmen katılmıyorum
4. Ne katılıyorum ne katılmıyorum
5. Kısmen katılıyorum
6. Çoğunlukla katılıyorum
7. Tamamen katılıyorum

48.IoT ile beraber pazarlama faaliyetlerinde, maliyet düşürme olumlu yönde etkilenecektir. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

49.IoT ile beraber maliyet azaltıcı teknolojilere yatırım olumlu yönde etkilenecektir. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

50.IoT ile beraber firmamızın, rakiplerine göre düşük fiyat politikası uygulamaları, olumlu yönde etkilenecektir. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

51.IoT kullanımı ile beraber satışlardaki yıllık ortalama artış olumlu yönde etkilenecektir. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

52.IoT kullanımı ile beraber pazarlama çalışan sayısında yukarı yönde artış olacaktır. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

53.IoT kullanımı ile beraber yeni müşteri sayınızdaki artış olumlu yönde etkilenecektir. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

54.IoT kullanımı ile beraber genel olarak pazardaki rekabet gücünüzdeki artış olumlu yönde etkilenecektir. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

55.IoT kullanımı ile beraber pazara sunduğunuz yeni ürün sayısındaki artış olumlu yönde etkilenecektir. *

1. Tamamen katılmıyorum

2. Çoğunlukla katılmıyorum

3. Kısmen katılmıyorum

4. Ne katılıyorum ne katılmıyorum

5. Kısmen katılıyorum

6. Çoğunlukla katılıyorum

7. Tamamen katılıyorum

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