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INDUSTRY 4.0; OPPORTUNITIES, CHALLENGES OF AIRPORT AND AIRLINE MANAGEMENT PRACTICES

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Abstract

According to past years' statistics, it is expected there will be soft journeys that travelers will design for their habits and preferences in the coming years. Companies traveling in the aviation, travel and tourism sectors will optimize their customer experience by collecting data, exchanging data and constantly acquiring knowledge. Over time, travel will smoothly blend in with other daily activities and become frictionless. The greatest influence of these conveniences is that the world is moving toward digital transformation. And this digital transformation is called the industry 4.0. After this time, not only the aviation sector, but all sectors, must protect themselves by taking a precautions and drawing a strategic path. With the fourth industrial revolution, digitalizing enterprises need to create an innovation ecosystem that allows them to collaborate with all stakeholders. This study, conducted in the form of literature review, which is considered as the concept of innovation and business model of the industry 4.0 concept, and interconnected airlines and airports are conceptually discussed.

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Keywords: Industry 4.0, automation, business model, innovative airlines, innovative airports.



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1. Introduction

Digital transformations are increasingly impacting on companies. It is expected that businesses will develop appropriate strategies for this transformation, as automation-based production is increased, dark factories are created, and all devices are connected to one another and created by cyber environments. Although it is perceived as a threat by societies, it should be considered as an important competitive advantage especially in economic development. Because in the fourth industrial revolution, future business models are being created and integrated into all business operations. Of course, it is envisaged that large investments will be made especially in the digital production technologies in order to establish the necessary infrastructure within the adaptation process (Ovaci, 2017).

With the global competition and the intensification of globalization, it is necessary for aviation companies to act quickly in the adaptation process so that they can become a digital enterprise. The life expectancy of products is getting smaller, the service is getting more and it is a proof of how fast the change has to be. It is beneficial to be able to offer products to the market faster and with the best service and to utilize open innovation strategies to shorten the innovation cycle.

Depending on the increasingly digitized world, this paper addresses the business model and innovation in different segments by making it dependent on the Industrial Revolution. These concepts open up digital convergence at airlines and airports, making them subjected on Industry 4.0. It is one of the most important factors that affect the economy of the countries in the world. In this respect, from past experiences, more importance is giving to the future to this area.

2. Literature Review and Theoretical Framework

2.1 Strategic Business Model and Its Components

The business model is an approach to generating revenue at an acceptable cost, which includes assumptions about how an enterprise will create and capture value. The business model includes assumptions about what the management wants and needs of the customers, and how the business can earn the best of these needs (Gambardella, McGahan, Alfonso, & Anita, 2010).

The similarity between the development of the "business model" concept and the business applications in the rapidly developing internet environment since the 1990s has been interpreted as the application of the internet is effective in the development of the business model concept. In an interesting research on this subject, several scientific publications from 1990 to 2003 investigated how many times the concept of "business model" was used and 7 publications were published as full articles on business model in 1990. This figure increased every year and reached 667 full articles in 2003 has been determined. Interestingly, the development trend of the NASDAQ index, which follows the performance of technology-intensive companies in the capital market between the same dates, is very close to the development trend of the business model concept. Interestingly, the development trend of the NASDAQ index, which follows the performance of technology-intensive companies in the capital market between the same dates, is very close to the development trend of the business model concept (Korçel, 2015).

The Canvas business model provides entrepreneurs with an environment where basic business and support activities in the supply chain process of new business ideas can be easily understood under the nine core components. These core components cover four main areas: customer, product, infrastructure and

finance. Under these headings, the Canvas business model has nine titles to fill (Osterwalder & Pigneur, 2013).

2.1.1. Value Proposition

An enterprise offers to its customers; price, quality, performance, choice, ease of use and so on are named as "customer value proposition" (Erk, 2009). Today, as customer demands and needs evolve and change, the value propositions presented to the customers are changing rapidly. In a changing competitive environment, as the value standards increase, we need to create different values for different customers. For example, Turkish Airlines competing with global competitors in the airline market and can create value for its customers through more destinations and service networks such as Emirates Airline.

2.1.2. Customer Segments

Bill Aulet (Aulet, 2013), a professor at MIT Entrepreneurship, says, "A client is a client who pays a necessary and sufficient condition for a job." At this point, the customer is the patron of the classical phrase operator and it is important to know everything. This effort towards customer recognition reveals the need for different groups of customers to be classified by businesses. Customers are different and their needs are different. The value of each client is also different. (Peppers, 2004). For instance, Turkish Airlines is applying Miles&Smiles and Emirates Airlines is implementing Skywards ease according to their customer classes.

2.1.3. Channel Strategies

Channels that you will reach from the customer are valuable, and the customer is an important point related to the immobilization of your channels. According to a statement at Cloudnames site, "Today, customers want to be able to interact with loved brands on the internet. The personalized service period has returned to business. A good website, a quality blog and a powerful social media presence are tools for creating leads in the digital age " (Ensari & Eser, 2006).

2.1.4. Customer Relationship

After the industrial revolution, the effort to sell a surplus of the finished product of mass production became the first stage of customer valuation, and as a consequence of the increasing global competition after the 1980s, the customer became more important than ever. Nowadays, business model strategies are shaped by the needs of the customers.

2.1.5. Revenue Streams

Revenue streams show how we earn money from our customers. In the Business Model Canvas, different customer segments can pay us differently. Without a sale, a business will not work, which is why the concept is one of the most important aspects of an enterprise.

As a result, determining our income model, communication with the customer seems to have an effect on the way we communicate, but it is very important in terms of the continuity of the existing business.

2.1.6. Key Resources

Key Resources, describe the most important things that a business model should accomplish in order to live a good life. Basic activities such as basic resources also differ according to the business model (Osterwalder, A; Pigneur, Y, 2010).

2.1.7. Key Activities

They are the necessary and important sources for the emergence of a business model. Basic sources; can be defined as "all assets, capabilities, organizational processes, knowledge and learning that contribute to the effectiveness of the business and can be controlled by the business" (Barney, 1991).

It is important for companies to list their resources, firstly classifying their resources and then bringing them back to the forefront of their competitors. These resources are key in determining the business strategy and will affect the business performance.

2.1.8. Key Partnerships

Establishing a strong partnership in the market is a great way to make sure we promise to our customers that we can help our broaden that they can reach. If there is a doubt about the success of the project, which is considered due to lack of capital, need for resources or competitive position, it is necessary to turn to partnerships. It will also be useful to pre-design such issues as the designation of partners, the form of partnership and process.

2.1.9. Cost Structures

The section that summarizes all the costs that will arise when constructing a business model is the section that has a lot of focal points in classical feasibility studies. Today's intensive competition environment enterprises are forced to spend cost structures in sight. The cost structure refers to the direct cost of first material, direct labor cost, and the ratio of overall production costs to total cost (Elitaş, Çonkar, & Erkan, 2006).

In order to organize the cost structures and make them more competitive, the enterprises have different applications. Concepts such as change engineering, Kaizen, and total quality management, which enable to reduce non-value-creating activities and continuously improve value-creating activities at this point, have become increasingly important and become mandatory for international businesses.

2.2. Innovation and Industry 4.0

The effects of the industrial revolutions that are living up to the day-to-day on the sophistication of society and countries are great. Each revolution; it is seen that the developed innovation has started as a result and triggered many economic, social, scientific, cultural and social changes. Production systems based on muscle power in the past centuries; has taken a different shape with the developed technologies. The increase of technological innovations has led to the emergence of new revolutions by changing the relation between production and consumption (Brettel, Friederichsen, Keller, & Rosenberg, 2014).

The technological opportunities that the new industrial revolution has provided are supporting the expansion of the open innovation paradigm as a competitive advantage. According to Chesbrough's definition in 2003, open innovation is a paradigm based on the idea of "businesses that want to keep pace with technological developments need to use internal and external innovation ideas and market channels" (Chesbrough, 2017). When evaluated in this respect, many technologies, policies and applications that have taken part in life together with Industry 4.0 are creating opportunities as important tools in the creation of open innovation.

The industrial revolution of 4.0 or the widespread use of Industry 4.0 is based on Kagermann's 2011 article. Industry refers to the evolution of the 4.0 revolution not only in automation, but also in intelligent observation and decision-making processes. Industry 4.0 is still a controversial issue. On the one hand it is a vision that it is really a revolution, on the other hand it is a sudden change in the industry and a revolutionary evolution of the revolution (Alçın, 2016).

One of the most controversial aspects of the industrial revolution is the effect on employment. It is argued that unemployment rates will increase with industry 4.0 solutions in many sectors that are not fully automated yet in need of human power. It is anticipated that this change in the labor market will affect not only non-qualified employees but also white collar and manager representatives (Bonekamp & Sure, 2015). Sectors have become heterogeneous due to changing customer expectations and needs. In order to meet these needs, efforts are being made to increase flexibility and capacity by using intelligent production systems. Simple and uniform processes are transformed into automation. However, in order to be able to complete operations related to other complex processes of production including the management stage, employees with creative and coordinating abilities started to need more strategic thinking. There are also anticipations that the revolution will create new lines of business and profession groups, which have caused changes in the workforce structure of enterprises (Hecklau, Galeitzke, Flachs, & Kohl, 2016).

Nowadays, digital is tightly connected to every business. However, even with technology as an integral part of the organization and its strategy, no people have been seen to support the success that continues to rediscover itself until now in the world. In 2016, Accenture Technology Vision draws attention to five new technology trends that shape this new landscape. Whether you start with any trending technology, you will see that each one of our "People First" theme is literate. Tomorrow's leaders are putting these trends and strategies into practice to secure their open digital advantage (Nanterme & Daugherty, 2016). These five steps will be briefly explained in the following paragraphs and in the third section of this article they will be explained as a strategy of use in the Airline and Airport markets.

Trend 1: Intelligent Automation

Intelligent automation is the launching ramp for new growth and innovation. With the help of Artificial Intelligence (AI), the next wave of solutions will gather data from unprecedented amounts of different systems and produce solutions that change the foundation of the organization by bringing systems, data and people together. It also improves what you do and how to do it at the same time.

Trend 2: Liquid Workforce

Companies are investing in the tools and technologies they need to keep pace with the digital age. But there is often a critical factor behind: the workforce. Companies need more than just the right technology; This technology needs to be used by the right people to make the right things in an adaptable, changeable and responsive liquid workforce.

Trend 3: Platform Economy

The next wave of devastating innovation will come from technology-based, platform-focused ecosystems that now form amongst the industry. Strategically leveraging technology to produce digital businesses, leaders are now creating an adaptable, scalable and interconnected platform economy that successfully supports an ecosystem-based digital economy.

Trend 4: Predictable Disruption

Every job now understands the power of digital transformation. However, the less dramatic and sustainable the changes from new platform-based ecosystems are, the less likely it is to be understood. It's not just business model that will turn heads. As these ecosystems create a strong, predictable deterioration, all industries and economic sectors will be completely redefined and rediscovered.

Trend 5: Digital Trust

Common new technologies are creating powerful new digital risk issues. Without trust, businesses cannot share or use data that supports their activities. For this reason, today's most advanced security systems go beyond providing environmental safeguards and are strongly committed to the highest ethical standards for data.

3. Innovative Relationship; Airlines and Airports

Over the past 30 years, the airline industry has seen a number of changes, such as the increasing market share of low-cost carriers (LCCs) and the challenges they face from volatile infestations from ill-fated disease outbreaks. As a new wave of technological change and innovation emerges, the next 30 years will be more turbulent. Some see it before the taxi driver arrives at Uber, sweeping the airline industry, citing the taxi industry, the music industry before downloading the internet, and the print industry before computer design software (Future Of The Airline Industry, 2017).

Air travel is in a period of great change. With a fast pace of innovation, airlines and aircraft manufacturers are constantly trying to keep up. Often, companies that make airline and aircraft are not everything well equipped to react quickly to change. A new plane has been in service for more than ten years and has been designed to continue flying for several decades. Like the automotive industry, aircraft manufacturers and people who fly their planes understand the need to prevent the development of aircraft hardware and software. An industry bound to the boundaries of flying metal is moving towards a future where software is important. At the moment, the industry is working on a number of potentially changing innovations that will find ways to use common airways for the next few decades (Zhang, 2017).

As smartphones become more common, there are many applications too. Today, even airline companies and aircraft manufacturers are adapting to accommodate in-flight use. Last year, for an application called Boeing vCabin, passengers started setting up lighting levels in the immediate vicinity, as well as launching an application that allows flight attendants to call, order food, and even control whether the toilet is free. In the meantime, the phones have also been adapted to internal components such as the Recaro CL6710 business class seat designed to allow mobile applications to move the seat back and forth (Stannard, 2017).

Over the next 12 months, airlines and airports around the world will be tasked with the challenge of identifying new and emerging technologies that have the potential to improve the customer experience, potentially improving both locally and instantly and have operational efficiencies. It would be right to discuss artificial intelligence without thinking about robots. This time last year, much talked about the robots face-to-face with the customer to provide on-site support to the passengers, but it could be the operational role that robots will have the most impact (Initiatives, 2017).

The Haneda Robotics Laboratory of Japan Airport Terminal has emerged as a frontrunner in this field and will soon judge seven robots in a live airport environment. These robots will be able to carry out various tasks ranging from proposing the potential security risks to the transport of suitcases. The ultimate goal is for a fleet of fleets to be deployed at Haneda Airport before the start of the Tokyo Olympics in 2020. Incheon Airport is also investigating a new generation of robots in other parts of Asia and recently conducted a test of LG's Airport Guide Robot. and Airport Cleaning Robot.

4. Five Innovative Trends in Terms of Airlines and Airports

4.1. Trend 1: Intelligent Automation

Leaders will go into automation to create a new digital world that will not only benefit from the limitless speed of digital change, but also gain competitive advantage. Machines and artificial intelligence will be the newest members of the workforce, bringing in new skills that will help people to do new things and will rediscover what is possible. Machines and artificial intelligence will be the newest members of the workforce, bringing in new skills that will help people do new things and will rediscover what is possible.

In 2017, the artificial intelligence (AI) air transport industry was really ahead. After many years of labeling as "the next big thing," a large number of airways produced AI-focused products. Airlines from New Zealand Airlines to Aeromexico and from Air New Zealand to Lufthansa are now able to respond to more basic questions and now there are chat channels that can support customers on this channel.

Turkish Airlines, the intelligent luggage robot "Leo" transfer center, was introduced at the Atatürk Airport to passengers and the press. It was developed by Sita, one of the leading companies in the production of information technology for air transport, the luggage robot "Leo" was developed to serve passengers who complete check-in online at home, at the office, or at airport kiosks. "Leo" produces luggage labels by meeting passengers at the airport, boarding card or boarding square code on the mobile phone, and finally delivers the baggage to the baggage delivery staff safely (Milliyet, 2018).

4.2. Trend 2: Liquid Workforce

Companies are investing in the tools and technologies they need to keep up with the digital age. However, in order to achieve its ambitious goals, leaders often focus on a missing factor: the workforce. Technology is seen not only as an annoyance, but also as a facilitator that transforms people, projects and all their organizations into an extremely harmonious and volatile organization. In short, business world leaders think that the new liquid workforce can become a new competitive advantage (Accenture, 2016).

The greatest societal impact can be the impact of the digital transformation on the travel workforce, which can represent one person in every 11 jobs worldwide until 2025. Intelligent automation will change the nature of some travel affairs and completely eliminate others. However, digitally activated growth will create new employment opportunities that can overcome the automation of existing roles, especially as it predicts strong growth for the sector. Platforms also enable "liquid", flexible workforce models that will redefine the employer-employee relationship and create new challenges for organizing the workforce. Collaborative efforts on industry, government, educational institutions and civil society will be necessary to reduce adverse effects. Digital transformation requires a different skill set than employees in today's economy and will create new types of work. Aviation, travel and tourism players will need to adapt to this transition because they transform digital ecosystems and change is driven by the people in the organization. Challenges such as managing automation's impact on employment, reviving the industry workforce for digital economy, and creating a safety net for workers in a flexible workforce, should be addressed in collaboration with industry, regulators and policy makers.

Automation is likely to be an important influence in the workforce. Until now, the focus of the media fear that robots and artificial intelligence could take the place of human workers. However, the creation of a new generation of workforce that requires people and machines to work side by side will be an important trend.

4.3. Trend 3: Platform Economy

Leaders of the industry release the power of technology by developing digital platforms and developing platform-based business models and strategies. But technology changes are only the beginning. Transformation is covered by macroeconomics: traditional economy, new economy, production services. Digital is one of the developments that enable companies to offer services instead of products. As an industry, aviation, travel and tourism have a beginning because the spectrum is a dense ecosystem at the end of the "new economy".

The airports will be opened to cities with their own inner areas, called aerotropolis, which have their own business areas. Human resources costs may increase and technology improvements may decrease due to productivity and possibly automation in the name of security. The airports will no longer be just an outlet, but entertainment facilities that offer food, shopping and more (IATA/Global, 2017).

4.4. Trend 4: Predictable Disruption

Companies have become accustomed to demolishing in the past few years and will once again hear alarm bells. But this time there is a big difference: they can see their initiatives. Ecosystem degradation will usually be a predictable deterioration. Because of the fact that ecosystems naturally depend on sectors and

business models, large organizations are particularly well positioned to estimate the course of the ecosystem and should benefit from them.

Technological developments also help create a revolution in the luggage space. The fall of the self-service pallet is, as we know it now, a widespread but new wave of development that completely redefines baggage operations. More passengers and bags work more than terminals at terminals around the world. Some stakeholders are already on the move. For example, the Lufthansa Group has partnered with Lufthansa, SWISS and Austrian Airlines to allow passengers traveling under the BAGTAG partnership to purchase reusable electronic bag tags, rather than using traditional paper bag tags attached to their bags each time.

4.5. Trend 5: Digital Trust

Trust is one of the most important factors in the digital economy. Without this, digital businesses cannot share data that supports their activities and cannot trust each other. In the digital sector, companies must gain the trust of individuals, ecosystems and regulators and have strong security and ethics rules at every stage of the customer journey. New products and services must be designed ethically. These entrepreneurs will have a high level of confidence that their customers will look at it as a guide to the digital future.

The distribution of new and emerging technologies which is the ongoing digitization of the air transport industry brings together a number of challenges and is one of the greatest tasks ensuring the safety of airline and airport comparisons. For instance, biomedical power is evident in the air transport industry, but now industry is gaining traction and technology can really start to have a transformative impact. The trend towards biometric processing can be seen around the world. In 2017, a number of US companies, including Delta and JetBlue (such as government agencies such as TSA and CBP), have invested in fingerprint and face recognition technology experiments.

5. Conclusion

To sum up, "Industry 4.0" and "Innovation" are vital for the aviation industry and its success is still very difficult. Tools like barriers and maps are useful, but not enough, to change the business model the digital process. Thus, the industry should follow the daily economy trends and other developments in the world. The trends mentioned in this article have an important factor in the innovation and business model of an industry. Organizational processes must also change with innovation. Companies should adopt an effective attitude towards business modeling. Some experiments will fail, but this should be expected - even encouraged - as long as the failure is aware of new approaches and the limits of economic losses. Companies that do not accept and follow innovation, expected to lose track of their development.

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