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Strategic Transformation in Airline Business Model and Management from Low-Cost Models to Hybrid Structures

Düşük Maliyetli Modellerden Hibrit Yapılara Havayolu İş Modeli ve Yönetiminde Stratejik Dönüşüm

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ABSTRACT

The aim of this study is to define the strategic transformation in the transition to the hybrid business model, which has been used increasingly recently, by explaining the most used business models applied by airline companies. In addition, important parts of the traditional and low-cost business models used by airline companies will be examined, the differences will be emphasized and the factors why the transformation to hybrid structures will be emphasized. The study also examines the business models applied by two leading airline companies in Turkey by making a comparison. In fact, it is understood that these companies, which choose different business models, also benefit from the more current and effective hybrid business structure due to certain conditions. The study also gradually explains how business models are converted to hybrid models. In the first part of the study, the business models applied by airline companies, which are among the most important businesses in the civil aviation sector, from the past to the present will be explained. In the next part, the business model of low-cost airline companies, which is used a lot, will be discussed in detail and the foundations of the subject will be tried to be established. Then, detailed information will be given about how the transition from low-cost business models to hybrid structures and its examples in Turkey today. In the conclusion section, the ideas obtained as a result of the explanations made and future predictions will be made. It is stated as a limitation that the information used in the study is taken from the reports submitted by the relevant civil aviation authorities and companies, therefore interpretations can only be made according to the available data.

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ÖZ

Bu çalışmanın amacı havayolu işletmelerinin uyguladığı iş modellerinden en fazla kullanılanları açıklayarak son zamanlarda kullanımı artan hibrit iş modeline geçişlerdeki stratejik dönüşümü tanımlamaktır. Ayrıca havayolu şirketlerinin kullandığı geleneksel ve düşük maliyetli iş modellerinin önemli kısımları irdelenerek farklılıklar üzerinde durulacak ve neden hibrit yapılanmalara dönüşüm yaşandığının etkenleri üzerinde durulacaktır. Çalışmada ayrıca Türkiye'nin önde gelen iki havayolu şirketinin uyguladıkları iş modelleri de karşılaştırma yapılarak incelenmiştir. Aslında farklı iş modellerini seçen bu şirketlerin belli şartlardan dolayı daha güncel ve etkili olan hibrit iş yapısından da faydalandıkları anlaşılmaktadır. Çalışmada işletme modellerinin ne şekilde hibrit modele çevrildiği de kademeli olarak açıklanmaktadır. Çalışmanın ilk kısmında sivil havacılık sektöründeki en önemli işletmelerden olan havayolu şirketlerinin geçmişten günümüze uyguladıkları iş modelleri anlatılacaktır. Sonraki kısımda kullanımı çok fazla olan düşük maliyetli havayolu şirketleri iş modeli üzerinde detaylı durularak konunun temelleri oluşturulmaya çalışılacaktır. Daha sonra düşük maliyetli iş modellerinden hibrit yapılanmaya nasıl geçildiği ve günümüzde Türkiye'deki örnekleri hakkında detaylı bilgiler verilecektir. Sonuç kısmında ise yapılan açıklamalar sonucunda edinilen fikir ve ileriye yönelik tahminler yapılacaktır. Çalışmada kullanılan bilgilerin ilgili sivil havacılık otoritelerinin ve firmaların sunmuş oldukları raporlardan alındığı, dolayısıyla sadece eldeki verilere göre yorumlar yapılabildiği sınırlama anlamında belirtilmektedir.

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1. INTRODUCTION

The civil aviation industry is one of the most global industries that connects people across continents and cultures, as well as being affected by political, strategic and technological developments, in addition to its economic and social impacts. According to the High-Level Industry Group (IHLG) report (2019), it is an industry that not only creates a transportation network, but also makes both facilitating and impressive contributions to employment, economic growth, international trade and finally tourism as one of the important influencers of the global labor market. Gerede (2015) defines air transportation, which is shown as an important building block globally, as the activities of transporting cargo, mail and people by aircraft, beyond being commercial. Although many different starting dates are stated, the process from 1903 to the present, which is generally accepted as the beginning of civil aviation history, is divided into four parts according to Wensveen (2016). The period called the Formation Phase, which started with the transportation of the first mail between 1918 and 1938 and the name Pan America, is shown at the beginning. The second part points to the period between 1938-1958, and shows the Growth Phase, which was experienced especially under the influence of World War II. The Maturation Phase, which was affected greatly by the development of jet-powered aircraft between 1958 and 1978, is the third phase. The fourth is the Liberalization Phase, which continues from 1978 to the present.

In fact, it is known that in all the development stages that are distinguished, airline sector businesses and especially airline companies try to survive by using many business models and strategies in order to sustain their existence and grow in a constantly increasing competitive environment. It is also understood that these four stages made for the history of civil aviation are inadequate in responding to the consumer needs that differ in today's social, economic and technological aspects. Because, despite the fact that such important steps were taken in the 20th century, when both its birth, growth and development took place, it should not be ignored that there is a more consumer-oriented demand differentiation in the 21st century. In today's world where human categories are emphasized more, the effects of Generation Y having more economic status and power and increasing demands are also seen in the fact that Generation Z can participate in issues less and in the medium term. The fact that the relevant effects are seen as changes in consumer behavior and customer demands and expectations also reveals a different social situation in a sense. Indeed, Dewalska-Opitek (2017) states that Generation Y has more innovative and technological demands regarding the transportation sector, and moreover, they tend to participate more in autonomous vehicle technologies. According to Martinez-Gonzales et al. (2021), although Generation Z consumers show similar characteristics to Generation Y consumers, they are shown as the drivers of the sharing economy by being more sensitive to economic, social and environmental issues, focusing more on digitalization with technology, and having a character that is less property-centered and aimed at increasing social relations.

The consumer demand elasticities, namely the differ-

ences between income and prices, encountered more in the new generation, also direct organizations to develop differentiated products. In the field where there are not many options in product and service differentiation compared to other sectors, several different business strategies are seen and implemented in the foreground. The most complex, detailed and difficult to implement of these is known as the low-cost business model. It is understood that many airline companies that have implemented this model in the last 20 years have taken the competition in the sector to a completely different dimension. In contrast, it is also seen that traditional airline companies, shown as the flag carriers, compete with low-cost airline carriers that implement different models in the market. Therefore, it should not be forgotten that the strategic decisions taken by organizations play an active role in the future of the business. The low-cost business model, which has a great impact on world aviation management, was used in Turkey later. In addition, it can be said that the implementation of hybrid strategies with the developing internet, social media and information technologies is parallel to world practices.

Another factor is the concept of Industry 4.0, which emerged after 2011. The increase in digitalization and technological innovation studies in many sectors is also shown as a harbinger of both economic and technological changes in the civil aviation sector, according to Sabella et al. (2020). For this reason, it is thought that the processes known as classical air transportation have transitioned to a different phase as of the 21st century. The aim of this study is to explain the development of traditional methods used in civil air transportation for a long time and low-cost air transportation models implemented later, and then to examine the transition process to the hybrid model. The use of hybrid strategies used more recently in airline companies and their results also reveal the main goal of the study. Since what is actually experienced here is the change and elasticity in consumer demands that have emerged with the new generation, the effect of this on the strategy changes of airline companies, which are seen as the locomotive in civil aviation, has been examined. The compilation and evaluation of current applications in the civil aviation sector, where different effects are seen with the effect of technology, information systems and Industry 4.0, reveals the goal of the study. First of all, the historical process and implemented strategies in the civil aviation sector will be stated in the study. Afterwards, the low-cost airline transportation model will be explained and the hybrid model will be emphasized. The subject will be better understood by giving examples from applications in Turkey. Because it is known that two airline companies that will be given as examples from Turkey implement both low-cost and hybrid management strategies. Although it is known that the lack of detailed information about businesses in the civil aviation sector shared with the public as much as necessary is effective in terms of the limitation of the study, it is thought that this deficiency has been overcome by utilizing the available domestic and international reports.

2. AIRLINE BUSINESS MODELS IN THE CIVIL AVIATION SECTOR

As a concept, the business model is explained as a working process consisting of a kind of value presentations according to both Porter (2008) and Lawton and Solomko (2005), while according to Magretta (2002), it is stated as stories that contain the answers to how organizations generate income. It is a fact that changes are experienced rapidly and the competition is intense in the civil air transportation sector, which is the first transportation method that comes to mind when speed, quality and comfort are mentioned. It is known that companies operating in this field have operated for many years by utilizing both limited and similar business models. According to Hansson et al. (2002: 31), it is stated that sustainability in business models applied in the aviation sector, both as a sector and in the context of literature, has decreased especially in economic terms. On the other hand, de Wit and Zuidberg (2012: 17) emphasize that business models applied in the civil aviation sector, where rapid changes are experienced, should be dynamic concepts and applications far from being stagnant.

According to Kuyucak and Şengür (2011: 62), the business models applied in airlines actually reveal how airlines conduct their operations and how much they value their stakeholders. In addition, according to Hvass (2012: 4) and Vidovic et al. (2013: 69), four main business models are generally used in the aviation sector. These models are called traditional, regional, charter and low-cost business models. It is known that different distinctions are made apart from this, but since the general distinction is thought to be in this form, when the literature is examined, it is understood that there are also numerical developments in research on business models over time. In addition to researchers who generally state that business models are similar to each other (Jarach et al., 2009; Wensveen and Leich, 2009; Daft and Albers, 2013; Bieger and Agosti, 2017), there are studies that state that business models are hybridized (Alamdari and Fagan, 2005; Klophaus et al., 2012; Vidovic et al., 2013; Taneja, 2017). On the other hand, it would be useful to state that there are also studies that recommend the use of different business models together (Heracleous and Wirtz, 2010; Douglas, 2012; Casadesus-Masanell and Ricart, 2010).

According to Önen (2016, 65) and Yılmaz (2017: 50), although there are different groupings in the business models applied by airline companies worldwide, they are divided into four groups according to the most commonly used distinction type. These four main groups include regional airlines, traditional airlines, charter airlines and low-cost airlines. Regional airlines operate on routes where other groups, namely traditional airlines, do not fly due to rela-

tively low demand or fewer passengers. According to Mutlu and Sertoğlu (2018: 531), they are airline types that operate with smaller aircraft types compared to airlines in other groups and are increasingly included in full-service airlines. According to Şengür (2004: 32), they mostly serve by collecting passengers and cargo in small residential areas on medium and short-range flight lines and bringing them to large airports.

The traditional airline companies shown in the other group are called a type of network carrier and actually provide services in a global area. They are known as the most well-known airline companies that provide complex services to various consumers in every level and class, again at different levels and quality. They provide flight services in national and international areas by making joint and connecting flights with regional airline companies. In these services, they also benefit from the collect-distribute network structure used in other transportation sectors. They have very different planning and management systems with their large and mixed fleet structures. In addition to selling direct tickets for the connecting and long-range flights they offer, apart from regular flights, they also provide ticketing and service provision through tourism and travel agencies. In addition, it is stated by Önen (2016: 63) that all or a very large part of traditional airline companies are state-owned, that is, they are called public institutions, due to the very large and costly flights they make. Therefore, it is known that they are also shown as flag carriers.

Among the airline company models, non-scheduled, or charter airlines, are also shown as simple-designed business types, according to Özkan (2019: 215), which have strong seasonal effects on their flights, and are mostly preferred and purchased by tourism organizations, and undertake individual ticket sales, thus supporting the reduction of costs of aviation organizations. Non-scheduled airline companies are airline companies that provide flight services to tourism businesses, and therefore provide package tours where tourism agencies provide transportation to touristic destinations. The fourth company model is called low-cost transportation airline companies.

3. LOW COST AIRLINES

Since the early days of civil aviation, low-cost airline transportation has progressed in parallel with the developments in the sector, which has been mostly comprised of traditional aviation companies, starting with the liberalization movements in the sector as a concept. The transition to more market-centered service offerings as a result of the reduction of strict regulations in the states that have benefited from civil aviation since ancient times has actually accelerated the development of this management style. The fact that the first example of low-cost airline management in the world is Southwest Airlines based in the United States has also led to the management model being given this name. According to Dinler (2018: 10), the term "Southwest Effect", which was used by the US Department of Transportation in 1993 to explain lower ticket prices and increasing passenger traffic, was also used for the first time to describe this company's application. As a result of the success of this application, many companies have tried to benefit from this strategy as a low-cost business model. It is expected that the number of passengers in the civil aviation sector will double its volume by 2030. The civil aviation sector, which experienced its brightest periods during the 2019 Pandemic period, is expected to play a very important role in the 2030 expectations, especially considering its recent growth rates, according to the International Civil Aviation Organization Reports (ICAO, 2021).

There are fundamental differences between low-cost carriers and traditional carriers in terms of both their service offerings and the main management strategies they implement. The differences in terms of scale, target market, general strategy, operation model and inventory management in low-cost and traditional air transportation approaches in terms of management approaches are shown in Table 1. When examined in terms of target customer, according to Hunter (2006: 316), while traditional airlines have larger fleet structures, they aim to serve all passengers in the market thanks to both complex flight network systems and more widespread service alternatives. On the other hand, it is understood that low-cost airlines are businesses that aim to provide the cheapest flight service to consumers who demand lower prices by refraining from some of the services applied by traditional airlines in order to reduce costs.

According to Akpınar (2019: 12), low-cost business models generally show more simplified service, tariff operations, utilization of airports, use of aircraft, fleet structures, sales, marketing policies and innovative methods used in labor use. The first of the main points that distinguishes the low-cost business model from other models is the regulations applied to passengers. Instead of serving the general public, consumers who think only in numbers and economically priced are targeted. In order to achieve this, it is chosen to create more affordable costs than other competitors and not to use services and services that increase costs. According to Özkan (2019: 214), in order to achieve this, first of all, it is decided to reduce, cancel or charge extra fees for refreshments on the plane. Paper waste, known as an important cost element, is also prevented and transitions are made from printed documents to digital media, and online or electronic ticket applications are used instead of printed tickets. In addition, the paid seat selection right added to reservation systems can prevent both reservation cancellations and low capacity applications, thus creating cost efficiency.

The other different part is related to flight operations. Generally, low-cost carriers aim to reduce their operational costs by planning shorter flight routes. Again, flying to

Table 1. Differences Between Low Cost and Traditional Air Transportation

	Low Cost Air Transportation	**Traditional Air Transportation**
General Strategy	Cost reduction, Cost leadership, Entrepreneurial character.	Differentiation.
Scale	More efficient but smaller scale businesses.	Large traditional businesses.
Operation Model	Point to point, short cycle length (400-600 nautical miles), Short range flight lines, Use of single type of aircraft, High capacity utilization (approximately 70–80%), Fast turnaround between sectors, Low margins.	Gather and distribute / multiple gather and distribute, connection with feeder routes, Mix of short/medium/long haul routes, Variety of aircraft types and engines, Moderate capacity utilization (around 60%).
Market	Cheaper travel player in the market, Pricing based on booking times and flight selection, Basic service quality, No refreshments and meals or paid, Ground services mostly outsourced, Use of secondary airports.	In competition with traditional carriers, a strategy of differentiation by class (quality), High service image, Frequent scheduling and flight flexibility, Comprehensive in-flight services, Comprehensive ground services, Use of large airports.
Inventory Management	Simplified inventory management, Online booking, Ticket-free service, Travel agent-free service.	Pre-arranged tickets and seats, Complex reservation system with feeder routes, Service with travel agency.

Hunter (2006: 316).

places with low-density flights, and therefore less airport payments, rather than to more intensively flown airports is among the general goals. According to Yılmaz (2017: 52), in this way, both the duration of stay in the air and the service processes at the airport are reduced, thus providing cost efficiency, and the reflection of this on the consumer side is lower ticket pricing. Another cost efficiency element, utilizing a single type of aircraft model, reduces the maintenance costs of the aircraft in hand, while allowing the maintenance costs to be kept under control. The maintenance and repair costs of aircraft are expressed in very high figures. It is not possible for airlines to continue their operations by meeting such figures with low costs. Since almost all of the relevant businesses do not have the economies of scale that they should have, technical services, which have an important place in operating costs, are transferred to different external companies that will provide them with lower costs. It is known that airline companies avoid extra fixed costs with this method, which is called outsourcing. According to Gross and Schröder (2007: 37), low-cost airlines that have a single type of fleet and outsource technical and other service work to external companies, thus making use of outsourcing, save 60% thanks to this method. It should also be noted that outsourcing ground and passenger services to external companies or contractors largely eliminates the expenses of low-cost airlines in terms of station, personnel and facility expenses.

Another important part of the arrangements made in the aircraft of low-cost airlines is to reduce the seat intervals and allow more passengers to be carried within the safe flight limits. Since consumers focus on price after quality and safety, they can choose cheap service by sacrificing their comfort in shorter service usage compared to other transportation models and carriers. According to Tanrıverdi and Çulha (2010: 66), low-cost airlines aim to increase the occupancy rates by increasing the price attractiveness due to the fact that other companies' first class, business class etc. applications are not used. Apart from this, according to Mutlu and Sertoğlu (2018: 530), thanks to the internet-based applications that are used very intensively today, the preparation of advertising and promotion information in a clear and concise manner, the use of more technology and the reduction of commissions paid to intermediaries are shown as other cost-effectiveness strategies used by low-cost airlines. Recently, the strategies used by traditional low-cost airlines have changed due to consumer needs, regional variables and extreme competition conditions among airlines. According to Dobruszkez et al. (2017)

and Jimenez et al. (2017), it is seen that low-cost airlines also use primary airports for their flights or enter into long-term flight routes by slightly straining cost efficiency. On the other hand, it is not possible for traditional transportation airlines to remain unresponsive to this situation. It is seen that traditional airlines apply aggregation-distribution systems by establishing lower-cost companies affiliated to themselves as a strategy or gain an advantage over rival companies thanks to the low-cost subsidiaries they establish. It is thought that this situation will increase even more in the coming years in the civil aviation sector, where heavy competition conditions are valid, and on the other hand, it is estimated that the part that will benefit the most from this situation will be the consumers who prioritize the price factor in air travel.

4. HYBRID AIRLINES

According to Corbo (2017: 2), businesses operating as both low-cost and full-service carriers are undergoing transformation due to the intense competition environment in today's industry. According to Vidovic et al. (2013: 3), this transformation began to be seen more dominantly as a result of the economic crisis experienced in the 2008s. Here, it is understood that studies on more hybrid model structures intensified after the economic crises experienced. Existing airline companies have started to adopt hybrid models without changing their current situation models in order to both grow and increase their profitability. According to Avram (2017: 5), the system with innovative strategies that allow airline companies to operate more flexibly actually shows the hybrid business model. In this sense, an airline company that implements its structure as a hybrid is considered to have both full-service carrier and low-cost carrier qualities together, and accordingly, to be able to balance the costs with the service provided. Low-cost airlines combine the price and product differentiation policies applied to full-service carriers as business models, creating a kind of hybrid structure. In addition, according to Tomova and Ramajova (2014: 3), they state that low-cost carriers try to increase their level in the market by benefiting from the loyalty programs used by other full-service carriers. It is stated by Klophaus et al. (2012) that many low-cost airlines in Europe have now adopted a hybrid market strategy and changed the factors in their basic business structures. In this understanding, it is explained that a hybrid airline company offers more seat width and in-flight entertainment compared to its competitors, as well as expanding its flight networks by cooperating with traditional airlines. According to Stoenescu and Gheorge (2017: 578), they mention that there is no clear definition that indicates that hybrid airlines or known low-cost carriers are hybrid businesses as airlines.

When looking at the Turkish market, the most prominent airline in this regard is known as Pegasus Airlines. Initially entering the domestic market with scheduled flights in 2005, Pegasus Airlines' business model is defined as a low-cost airline and continues to operate in accordance with this definition today. In some studies, it is stated that the relevant airline company does not comply with the low-cost business model and continues to operate more as a hybrid carrier. Stimac et al. (2012) state that Pegasus Airlines is a type of hybrid airline company since it increases its flight networks in a wide geography by sharing codes in addition to its regular flights, also has loyalty programs with a different structure, and benefits from different sales networks by working with both internet sales networks and local agencies. However, according to Rozenberg et al. (2019), it actually has a type of hybrid airline character because it does not only provide a single type of passenger transportation but offers services that appeal to a wider variety of passengers.

When the reports in the civil aviation sector are examined, it is understood that Pegasus Airlines was exactly like a low-cost airline company in the past, while Turkish Airlines clearly continued its operations as a full-service carrier. According to Taşcı and Yalçınkaya (2015), after it was understood that Pegasus Airlines increased its share in the domestic market, Turkish Airlines' establishment of AnadoluJet as a sub-brand as a precautionary measure is seen as a strategic step in terms of entering both the hybrid and low-cost airline markets. In addition, the AnadoluJet study should be evaluated as a successful business model change on its own as a good product differentiation. It can also be said that with this change, Turkish Airlines has implicitly changed its business model style and has switched to a hybrid model outside of the general structure.

When the reports in the civil aviation sector are examined in the following years, it is understood that there is competition between Turkish Airlines and Pegasus (DHMİ, 2019: 130). The harsh conditions of the competitive environment have led to a transformation in the business models of all companies. When compared to previous reports, it is understood that there are sharp differences in network structures, partnerships, operational studies, sales, marketing and distribution networks and loyalty programs. It is thought that the only similarity is the application of working methods that are similar to each other in terms of business models. Pegasus Airlines, which used a single type of aircraft models in the previous years, later included different types of narrow- and wide-body aircraft in their fleets, Turkish Airlines, which operated with a single brand in the previous periods, entered the low-cost aviation segments with AnadoluJet company and also benefited from a single type of narrow-body aircraft, can be given as examples in this section. Especially when we look at the types and models of aircraft used, it is understood that the business models between the two companies have also started to resemble each other.

Apart from this, it is known that Turkish Airlines has loyalty programs that are used and seen to be very beneficial, since Pegasus Airlines did not have a loyalty program in previous periods. With the change experienced, it is seen that Pegasus Airlines has started to create a special loyalty pro-

gram for itself after 2013 and offer its consumers the opportunity to earn income from the flights made. It is also known that Pegasus Airlines, which did not have any flights other than its own at the beginning, became involved in bilateral and code sharing studies after the agreements made, and that they expanded their flight network structure significantly by becoming a member of Star Alliance, which is at a very good level in terms of international aviation trade after 2008. In addition to these, the fact that AnadoluJet, as a sub-brand, uses the system used by Pegasus Airlines for in-flight catering services, rather than Turkish Airlines, is the biggest indicator of the existence of mutual interaction in this sense. Again, the fact that catering services are offered with additional pricing on flights and that wider and desired seat arrangements are made for a fee can actually be considered an indicator that a kind of hybrid structure is used.

5. BUSINESS MODELS AND STRATEGIES OF AIRLINE COMPANIES

It would not be wrong to say that airline companies actually play one of the most critical roles among civil aviation companies and connect all market companies, and therefore all different companies in the sector unite around airline companies. According to Budd and Ison (2017), the aviation sector is a competitive, dynamic, economy-centered and politically structured field that is heavily affected by the external environment. For this reason, companies that want to continue their existence in the sector need to be successful in implementing different business models as well as developing different business models.

In the distinction of airline companies, whose differences and varieties are constantly mentioned, flag carriers, low-cost carriers, charter carriers and regional carriers are explained. In the intersection clusters of these different business models mentioned, hybrid models are mentioned more today. In fact, this method, which is also called a hybrid or mixed business model, can also be shown as the definition of airline companies that are subsidiaries of large companies or provide services under them. In the aviation industry, which is constantly changing and where fierce competition is experienced, it is not that easy to define airline companies as low-cost or traditional airline companies. In addition, adding the hybrid business model to this type and spreading its use in businesses is more difficult.

According to Lohmann and Koo (2013), hybrid business models in the aviation sector are explained as models that increase the desired demands, can survive in a fiercely competitive environment, and can incorporate the features of low-cost airlines. In fact, it is thought that many businesses are trying to convert their current business models to hybrid models for this purpose. According to Corbo (2017), the reason for this is that many markets have reached saturation points and low-cost carriers are forced to expand their services due to the great competitive pressure they are exposed to. However, the competitive environment experienced in the market, the increase in the dynamism of the market, the entry of increasing airlines into the market, and also the demands for niche markets are considered as a transition to hybrid models, according to DLR (2008).

Considering the distance covered by the civil aviation sector from its early days to the present and the radical changes it has undergone, it is possible to expect similar changes in the future. According to Linz (2012), some changes mentioned in the study where various perspectives are explained in terms of future vision in the future processes are explained. Firstly, it is stated that there will be an increase in demand for easier applications in general purpose or business transportation and thus time losses will be reduced. Another article explains that passengers will have more individualized service demands in the future and they will want door-to-door services specified as integrated in cargo and business transportation. Another change is added to the predictions that the aviation sector will take on a more fragile structure due to possible fuel crises, war, global economic crises, epidemics, volcanic eruptions and terrorism. Another expectation is that luxury and business consumption flights will increase, and in the jet market, longer flights will be made with smaller aircraft and point-to-point flights will be made more suitable. Another prediction states that if the uncertainties in the aviation sector continue, business or similar trips will be managed with a pool system under one operating roof.

Duncan and Natarajan (2017) stated in their research on the future of the aviation sector that technological developments, global fluctuations, changing consumer options and competitive environments may lead to some radical decisions, and as a result, new economic, innovative, technological and demographic-centered approaches and new business models may emerge in an unpredictable manner in the future of the aviation sector. In addition, it is thought that the sharing and membership economy will also be used successfully in civil air transportation. According to ICAO (2021) reports, 51% of the world's population today lives within 100 km of any international airport and 74% within 100 km of any airport. Therefore, while access to air transportation is expected to increase worldwide, it is estimated that air traffic will also increase significantly as a result, and it is stated that innovations are needed now and urgent action should be taken. With the development of technology and systems, it is seen that more efficient, lighter and technological aircraft and components are designed and produced today. ICAO (2020) reports emphasize the importance of the rapid participation and adaptation of all stakeholders in this process as quickly as possible, predicting that with Industry 4.0, approaches suitable for components will increase, and that unmanned aerial vehicles will be used not only for cargo transportation but also for passenger transportation. It is explained that when the dates show 2050, two-thirds of humanity will live in cities more

than in rural areas, civil air transportation will become a basic need, and that efficiency, communication, speed, quality and access will continue to maintain their positions as consumer demands. In this context, in order for businesses in the civil aviation sector, where competition conditions are very harsh, to maintain their existence and increase their income, it will be possible for them to take their place in the market with a more innovative perspective compared to the business models applied by traditional airline companies. According to Pereira and Caetano (2015), the important part begins with the correct analysis of market dynamics and consumer demands and the correct determination of business models. Then, it will be possible to obtain successful results by diversifying the determined model flexibly in line with market expectations.

Sustainability is addressed in aviation applications, and the sustainability of many operations is not negatively affected. At the forefront of these negative situations are economic high energy consumption and the resulting high carbon emissions, while noise is prohibited, solid waste impacts on the environment and operations malfunction, and problems such as groundwater restrictions also show signs of this situation. According to Alpman and Göğüş (2017), the increase in the growth of these organizations leads to an increase in growth. The opening of the "Net Zero Carbon Emissions 2050" approved at the 77th Ordinary General Assembly of the International Air Carriers Association (IATA) held in October 2021 is considered an important step in determining the sustainability goals of current economic activities. This decision includes the commitment of IATA members to achieve the net zero carbon emission target throughout 2050. By 2050, net zero carbon dioxide (CO2) emissions can be achieved, the highest level of emission cuts, conductivity strategies and carbon capture technologies will be mandatory together. This situation can also change the pressure on the civil maintenance section. Similarly, a Carbon Offset and Reduction Scheme has been published regarding the regulation of carbon emissions. It is estimated that this program, which is supported by CORSIA, will be mandatory after 2027, depending on the participation between 2021 and 2026, and will again put pressure on transportation companies (Carbon Offsetting and Reduction Scheme for International Aviation – CORSIA, 2022).

The Green Deal aims to neutralize the European Union's carbon emissions by 2050. With this target, it is envisaged that greenhouse gas emissions in the EU region will be reduced by at least 55% compared to 1990 levels by 2030 (European Commission, 2023). Within the scope of the "Fit for 55" target determined for the aviation sector, an agreement has been reached between the European Parliament and the European Council to reduce greenhouse gas emissions by at least 55% by 2030. It has been decided to review the EU Emissions Trading System with special conditions for the aviation sector. Today, the European Union airspace, which is formed by bringing together the airspaces of many countries, has been integrated on a regional basis within the framework of the "Single European Sky" project. According to Pernice and Debyser (2023), this project aims to reduce operational costs by using the airspace effectively and efficiently in the European region. According to Köhn (2023), another benefit of the project will be to reduce carbon emissions by approximately 10% by shortening the waiting times on flights. In fact, it is known that the use of tax rates in air transportation is exempt from many types of taxes, especially due to the Chicago Convention signed in 1944, and international aviation fuels also benefit from this exemption. However, considering the need to reduce greenhouse gas emissions, different tax methods are being considered to reduce the environmental impacts of air travel. According to Büchs and Mattioli (2022), these methods include proposals such as air passenger tax, carbon dioxide tax per ton, frequent flyer tax and frequent flyer mile tax. Carbon dioxide and greenhouse gases, which are an important issue worldwide, pose a great threat to the sustainability of our planet and the lives of future generations. This situation is clearly accepted by the authorities and the transportation sector. Sustainability in aviation can be achieved by managing the increasing environmental impacts of flights.

The aviation industry operates with very narrow profit margins due to increasing competition and costs. While digitalization applications aim to increase profitability on the one hand, they also show that existing in the sector has almost become a necessity. While operating in a competitive environment, airline companies strive to reduce their costs and increase their sales through digitalization. In this context, the study examines digital transformation and digital application areas in airline companies that are part of the aviation sector. A digitalization map for the aviation sector is created by determining the digital applications used by airline companies operating all over the world in both internal and external relations. Digitalization applications have an effect on increasing the profitability of the business, but the installation and maintenance of these applications can be costly. For this reason, it may not be possible for every company to implement digitalization applications equally. The situation may differ from other companies, especially for airline companies that pursue a low-cost strategy.

According to Copeland and McKenney (1988: 1991), airline companies largely benefit from various internal and external information systems, based on global trends and the advantages provided by the use of new technologies in this area. In this context, thanks to global distribution systems, airline companies have gained the opportunity to quickly ticket, reserve, sell, access flight information, learn flight rules, make last-minute cancellations or changes, follow affordable prices, benefit from car rental services and make reservations for accommodation companies in the system. According to Bingemer (2022), most airline com-

panies benefit from four major Decision Support System providers. Thanks to digitalization, airline companies are forced to increase their profits and reduce their costs by improving both their internal and external operations and customer relations. In this context, airline companies use both software and hardware, including the digital systems mentioned above. These systems contribute to processes such as sales and marketing, operations management, resource management, maintenance management, customer relationship management and collaboration management. In addition, it is of great importance to store all data and analyze it to optimize it, and even to create a customer profile using social media data. All of these bring up three separate but interconnected factors. When the hardware and software used by airlines in this process and those they plan to use in the future are considered together, it is evaluated that these companies need to continue investing in order to maintain their presence in the sector and to maintain their competitive advantage in this area where profitability rates are low.

6. CONCLUSION

The civil aviation sector and air transportation have been affected by technological advances, economic events and sociocultural changes throughout history and have undergone changes in their fields and forms of operation. While airline companies, which have observed differences in the changes in business models over time, initially included full-service providers known as flag carriers or traditional carriers and low-cost airlines that could be their competitors, according to Urban et al. (2018), today it can be observed that these standard management forms have changed. In fact, the factors used in determining business models for airline companies, such as wages, on-time service, passenger and cargo loads, are not only decisive criteria, but also reflect the results of business models. Mehrabian et al. (2013) explain that operational, tactical and strategic decision levels should be the levels where business models are determined for companies, and they mention that sector and market analyses should be prepared by utilizing these decision processes. At the same time, it is very important for companies to behave according to the dynamic functioning in the market, the global economy and political position, and the sociological and cultural conditions of consumers who create the demand. Membership and sharing economy, autonomous vehicle and service technologies, developments in land, sea, rail system transportation and urban air transportation, which are other stakeholders of the transportation sector, which have been observed to have increased their influence recently, need to be followed very meticulously and carefully by sector professionals.

It is a fact that membership and sharing economies are constantly increasing and have serious popularity and awareness globally. It should be taken into account that these factors will also have an impact and attractiveness on the transportation and shipping industry. With the experiences gained after the vehicle sharing applications, which started to be implemented in the USA approximately 25 years ago, it is seen that vehicle ownership will not be very important in the future. It is a fact that the sharing economy, led by Uber and many others, which are among the leading transportation applications worldwide, has a different reflection according to Tzuo and Weisert (2018). It is known that there are changes in the civil aviation sector, where awareness is felt less compared to other sectors. Again, the reflections of membership and sharing economies are seen in this area. It should not be surprising at all that a Netflix or Uber concept, which is at the forefront in other sectors, will emerge in the aviation sector in a similar way in the near future.

According to Steele (2018: 32), the Future of Aviation 2035 report published by the International Air Transport Association draws attention to many economic, political, social and technological elements that the civil aviation sector and stakeholders in the market may encounter. These possibilities include the automation of aircraft, the transformation of used airports, the differentiation strategies that airline companies can implement, and the implementation of applications according to the changing demands of consumers and new business models. The possibility of increasing the use of high-speed trains, unmanned aerial vehicles and drones, which are among other transportation areas, and the possibility of these being competitors to the civil aviation sector are shown first. In return, it is stated that airline companies should focus on long-distance flights rather than short-distance flights and benefit from the benefits that automation and new business models will provide. It is also suggested that different applications should be adopted from the recently used hub airport style with the advantages to be obtained. Since the hub practice of bringing passengers from small airports to large airports and gathering them there has become outdated, new style intermodal network structures should be created with strategies such as utilizing secondary and smaller airports and a kind of Uber-style business model instead.

It is imperative to develop strategies to prevent the negativities that the civil aviation sector, which has recently been shaken by the Covid-19 outbreak, may experience in similar situations. It is known that the pandemic outbreak and its aftermath have caused a contraction all over the world, especially in the United States, and that some sectors have resulted in mergers or acquisitions called mergers. It is also well-known that this has led to both job losses for employees and disadvantages for consumers. It should not be forgotten that in the civil aviation sector, passengers will no longer see the advantages provided by low-cost carriers, they encounter fewer flight and frequency alternatives, and despite this, they have to pay much higher ticket prices compared to the previous figures. During the transforma-

tion of traditional business models, the civil aviation sector has had to deal with new adaptation and transformation processes, especially digitalization with Industry 4.0. In this process, which can also be called aviation 4.0, according to Cokorilo (2020), the aviation sector has had to face many industrial developments such as digitalization, new technologies, automation, air and noise emissions, electrical and battery technologies, aircraft performance, cockpit crew training, customer requests, and heavy traffic, as a problem. Therefore, new initiatives and research should be carried out for the development of civil aviation. In this regard, the Urban Air Transportation system, on which leading aircraft manufacturers such as Boeing and Airbus, as well as very large manufacturers such as Toyota, Hyundai and Uber are working together, is expected to mature in 2030 in the near future and explode globally, and to have a figure of 1.5 billion dollars in the next 10 years, according to Hornyak (2020). Similarly, it is planned to use vehicles that can travel at an average speed of 300 km and fly at an altitude of 1,000 to 2,000 feet in order to get rid of urban traffic congestion. In fact, it is aimed for these flights to start in 2025 and to make great progress by 2040. It should not be forgotten that these research and developments are carried out due to the need for innovation desired by stakeholders and customers in the sector.

Business Model Innovation (BMI) enables companies to gain competitive advantage not only through technological developments, but also by changing the value they provide, how this value is delivered, and the methods of generating revenue. This concept has become an important strategy tool for sectors that question traditional industry approaches and seek answers to uncertain market conditions. The aviation sector stands out as one of the areas where this innovation theory is applied due to economic fluctuations, digitalization, climate change, and changing consumer habits. The hybrid aviation business model aims to combine the wide range of services traditionally provided by full-service airlines with the efficient operations of low-cost airlines. According to the references made to Zott and Amit (2010), this structure provides a flexible alternative for both business and leisure travel, while gaining a competitive advantage thanks to cost management and digital service infrastructures. When examined in terms of business model innovation theory, hybrid approaches have a significant transformation potential in terms of customer segments, pricing, additional revenue methods, and service experience. In addition, according to Gössling et al. (2021), increasing environmental awareness and digitalization trends after the pandemic have made these hybrid systems more sustainable and data-driven. In this context and in the future, the transformation of hybrid aviation models will take shape around three main areas. The first is the deepening of digital integration, the second is the inclusion of sustainability goals in the strategy, and the third is customer-specific service design. Applications such as artificial intelligence-supported reservation systems, dynamic pricing algorithms, and carbon emission calculation tools will necessitate the restructuring of the business model. At the same time, new mobility solutions based on multi-sided platforms (e.g. comprehensive experiences from airport transfer to hotel integration) will transform airlines from being just carriers to holistic travel providers. This change also coincides with the dynamic competence and learning-oriented nature of Business Management Information theory according to Teece (2010).

The emergence of the low-cost air transportation model has contributed to growth in the sector, especially by supporting the increase in passenger numbers. In addition, the use of secondary airports has also increased in keeping costs low. Again, among the implemented strategies, abandoning all cost-increasing additional services and using only active aircraft and personnel can be stated as a new application. It should not be forgotten that no management style will bring success forever. Therefore, all businesses in the civil aviation industry may need to change their business models and strategies according to the developing and changing market conditions. As a result, it is evaluated that membership and sharing economy models will have possible effects that we all may encounter in the practices of the sector together with urban air transportation business models in the future. The situation, which is better known by sector employees, is that the sector has reached a certain level of saturation with its current situation, and that all airline companies basically use similar practices, except for the marketing activities applied by differentiating during the flight service, is actually known by passengers. It should also be considered that a period of stagnation has been overcome as a result of the recent pandemic, and that a good opportunity for rebirth has actually occurred with Industry 4.0 and its factors. It should be seen as a factor that different types of options in road transport, where the simplest examples are experienced, are also offered in the civil aviation sector, especially that digital technologies are used more and that more importance is given to the provision of more environmental services. In addition to the field of study, it is foreseen that more studies should be conducted in terms of the specified business models and strategies, and that other effective technological and human factors should be used together in research, which will make serious contributions to both the literature and the sector.

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