

A Perspective Exploration of the Airline Industry

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[Abstract] The main objective of this article is to provide a perspective exploration of the business model and, particularly, information systems of airline industry. To reduce the complexity of reviewing the airline industry, this article will probe into different components of the industry. After providing a brief background and literature review, it follows with industry structure, leading into the competitive strategy and value chains associated with the industry. Further, it continues by reviewing the role of information systems, some of its uses, drawbacks, and benefits; then it reports on several companies within the industry that have and have not made successful use of information systems. Finally, completing with concluding inferences.

[Keywords] airline industry, competitive strategy, business model, information systems

Introduction

Before 1978, the airline industry was mostly controlled in America by the United States government. During this time, there were very few airlines and the few that were flying were enjoying guaranteed amount of profits. Other airlines that wanted to join before 1978 had very difficult times as bureaucracy often stood in the way. The Civil Aeronautics Board (CAB), created in 1938, set airline routes, fares, and schedules for all airlines. If an airline wanted to get in the airline industry and create a new route for an existing airline, the approval had to go through the CAB. Bureaucracy, however, got in the way, as well as compliancy. Approvals from the CAB often took a long time and many of the approvals did not even go through because of the long lead times. The United States government had similar control over the train industry that led to the Penn Central Railroad company declaring the largest bankruptcy in US history. This resulted in a huge taxpayer bailout for the train company. Fearing that the airline industry was going to through the same turmoil because of the huge oil crisis in 1973, the United States government deregulated the airline industry in 1978. The Airline Deregulation Act of 1978 deregulated the aviation industry while keeping the Federal Aviation Administration from the CAB era to control aviation safety for all airlines in the United States (Button, 2017; Williams, 1994).

When the airline industry was deregulated, private companies had to figure out how to implement information systems and technology to maximize profits for their businesses. Airlines rapidly found themselves in a competitive circle in which the best airlines had the best information systems and, thus, created more revenue and better customer satisfaction.

Background and Literature Review

Pre-internet, relatively small companies could only consider computer-based systems once prices dropped sufficiently. Internally developed as integrated reservation, control, and planning management tools to replace inefficient manual systems, the tools were necessary as a result of greatly increased competition (Borovits & Neumann, 1988). Implementation included all levels during development to ease processes as pilot programs. Basically, such tools were a very early Enterprise Resource Planning (ERP) module interfaced with other systems, such as billing, logistics, catering, and so on. ERP built in the COBOL programming language for architecture universality with multiple layers of access (adding flights, adding passengers, creating reports, and so on) thus provided more efficient booking and better service and now adds information from other businesses (for example, hotels and rental car bookings). Akira is now a travel service company, not just an airline, selling airline management information systems as a new revenue stream in a very competitive airline industry.

Another article discusses how Delta is adding a new kind of mid-level operating information system (OIS) as an update to its legacy system. Furthermore, Delta states some of the particular scaling challenges with adding the potential for thousands of event update points, e.g. online reservations (Olsen et al., 2000).

Analysis of the Russian air transportation market shows data analysis of flights and flight ticket prices from Russia's two main hubs (Saint Petersburg and Moscow), both domestic and foreign, provides an analysis of how dynamic pricing varies, both the mean as a function of time and changes in the deviation becoming broader as time goes on (Colizza et al., 2006; Lantseva et al., 2015). Although it must be noted that being more analytic does not actually have much to do with IS within the airline industry itself.

Kilic, Zaim, and Delen (2014) in a published article describe selecting an ERP information system as a multi-criteria decision-making problem and advance a three-part hybrid methodology using fuzzy logic, an analytic hierarchy process (AHP), and the technique for order of preference by similarity to ideal solution (TOPSIS) in order to make that decision. It goes into the necessary requirements for selecting an airline information system and discusses various prior decision-making tools. Moreover, Kilic et al. use Turkish Airlines as a real-life example with different weights and requirements.

Furthermore, Kilic et al. recommend beginning the process with a focus group to discuss the requirements and desired features of the ERP information systems. On the technical side, these include functionality (what the information systems should be able to do, e.g. process payments, manage inventory, and deal with different languages), compatibility (determining the architecture and language that should be used, whether or not it should be based on cloud resources, and compatibility with other modules/databases, etc.), usability (graphical user interface design), overall design integration with other software, visual information design (e.g. charts), accessibility (browser vs. downloaded app / program, open vs. closed source), and security (proper encryption, data updates, and so on).

The corporate requirements are fewer and mostly deal with the logistics of implementing a new system, e.g. making sure there are sufficient users to make the system worthwhile, that developers and maintenance within the company are sufficient and that the providing company has devoted support personnel in case difficulties arise and to ensure the software is updated properly when necessary. Financial requirements apply to initial licensing and adoption costs, training and consultancy costs, and maintenance costs. Each of these requirements must be evaluated and weighed for importance. Is it an absolute necessity or is it merely a bonus? Some ERP systems can be eliminated if they do not fulfill necessary requirements, but others will likely be similar enough to require further analysis. Since ERP systems often cost several million dollars to develop or purchase, it is important to do this scientifically. Fuzzy decision-making helps bring rigorous structure to this complicated choice.

Recently, Zhou et al. (2014) wrote an article about how price-sensitive customers, in this case, backpackers, use distributed websites that use cloud-computing to calculate the most cost-effective flight from among multiple options. This is a kind of traveling salesman problem and requires large amounts of computational power, but the results can be accessed via a smartphone web-browser. This kind of resource not only looks at static prices, but takes into account dynamic pricing in order to provide the best deal.

A Brief Description of the Airline Industry Structure

The formal and standard structure of the airline industry is classified by the government into three distinct categories: major, national, and regional. Major airlines include Delta and Southwest, which have revenues of more than \$1 billion dollars annually. National airlines, which operate in a smaller area, include Hawaiian and Atlas Air. Regional airlines are divided into three sub-groups according to their operating revenues: large, medium, and small. Each airline must hold two certificates granted by the federal government, a Fitness Certificate and an Operating Certificate. These certificates are evidence that the carrier has financing and management to provide services. The operating certificates are issued by the Federal Aviation Administration and cover requirements for training the crew and aircraft maintenance (Federal Aviation Administration, 2017).

The airline industry in the United States alone is comprised of ten plus competing commercial airline companies. According to the Federal Aviation Administration, these airlines operate out of 514 commercial airports within the U.S. A recent report by the portal for statistics (Statista, 2017) based on data in 2017 shows that there are 6,861 commercial aircraft currently operating in the U.S. The large demand for flights and the massive amount of aircraft flying annually requires very large backing by the companies themselves. The top three U.S. airline companies are Delta, Southwest, and American Airlines. Recently, *Forbes Business Magazine* (Forbes, 2017) released information regarding these three companies' overall worth and number of employees. Delta is valued at \$34.4 billion with 83,000 employees, Southwest at \$30.2 billion with 49,600 employees, and American at \$22.1 billion with 118,500 employees. There is not a large number of competitors because of how massive the existing airlines are. They have all

dominated this industry, and some of them, including Delta, have been around for nearly a century. Markedly, the perceived structure of the airline industry is a classic example of an “oligopoly.” An oligopoly can be defined as a market controlled by a small group of firms. This is often the result of some sort of barrier to entry in the market, discouraging potential competitors from entering the market. In the airline industry, the barrier is cost.

The Dominant Competitive Strategy within the Airline Industry

When it comes to the airline industry, it is obvious that the few companies involved will be very competitive with each other (Structure of the Airline Industry, 2017; Porter, 2008). If not for the desire to be the number-one rated company, airlines also want to be the most used/booked. Airlines compete in many ways. Some of those ways include prices, frequency of flights, prices per bag, and even credit cards and rewards offered. Some companies have frequent flyer miles with which you can add on to lower the cost of your ticket or even use as currency for domestic and foreign flights. Some airlines have even gone as far as to team up with banks and credit card companies to help customers earn flyer miles by making everyday purchases. This strategy helps the airlines because now customers can not only make purchases through the airlines, but they can go about their daily lives and build points that can be used for travel. This gives the consumers an incentive to not only travel, but to use the same airline company because no one wants their points to go to waste.

Almost certainly, to attain dominant competitive strategy, airlines use simple tools like prices to compete (Kleymann, 2017; Pfeffer, 1995). The lower the price, the more likely that other people will buy a particular airline’s ticket first. Airlines also incentivize people to buy tickets earlier by introducing lower prices in the market depending on how early a customer plans ahead for a trip. The next big thing for airlines is increasing the number of flights per day. Whenever a customer is looking for an airline ticket and searches two different companies, the customer should pay attention to the number of flights in that one day. Some companies have more flights than others, and if the airlines know that they are the only ones with a flight at a certain hour of the day, it allows them to drive the price either higher or lower, depending on the demand for that certain time slot.

The Value Chains of the Airline Industry

Information technology is in all the parts of the value chain when it comes to the airline industry. As stated by Porter (2008), the value chains consist of inbound logistics, operations, outbound logistics, sales and marketing, and customer service. In an arena where airlines have a challenging time making profits, especially new airlines, Southwest Airlines has done an amazing job using information technology inside the value chain to create profit and, thus, expand their business throughout the years (Pearce, n.d.). Southwest Airlines started in 1971 with only three Boeing 737 aircraft that served three hubs. Southwest, as of 2015, has 692 Boeing 737 aircraft covering many hubs throughout the United States.

Looking at inbound logistics with Southwest Airlines, Southwest particularly chose Boeing 737's because it knew it was not an international flight carrier. Choosing smaller planes allows Southwest to conserve fuel so it can compete with other airlines. When Southwest started in its earlier days, it only had three aircraft and won legal rights to fly into Dallas, San Antonio, and Houston, Texas. Southwest, knowing that it would be difficult and expensive to fly from major airport hubs, started strategizing and flying from smaller hubs. The smaller hubs allowed Southwest airlines to compete with other airlines in the market at a more competitive price so that they could be profitable (Southwest Airlines, 2013a).

Operations with Southwest Airlines was critical for how the company would set itself apart from other airlines as it used information technology to run its business as efficiently as possible. Southwest went for efficiency when it came to operations not only in managing its aircraft, but also in how it handled ticket purchases and gate operations. Southwest allowed customers to purchase their tickets efficiently on the web from their own website. Controlling and having their own website allowed Southwest to avoid paying fees to third-party websites and, thus, increased profitability. The website also gave customers conveniences for which they were not charged extra, such as changing or canceling flights. At a time when most airlines were charging baggage fees, Southwest allowed customers to take two bags for free.

The convenience of the website and the free bags for customers created popularity with Southwest Airlines that allowed it to increase margins. Southwest used information technology by creating a different system when it came to seating. Customers now are boarded based on the numbers that fall between certain numbers but with no assigned seats. This allows customers to quickly board flights and take a seat so that the airline can quickly fly, reducing flight times and delays (Southwest Airlines, 2013b).

Southwest Airlines uses the point-to-point structure rather than the hub-and-spoke structure that airlines such as Delta and American use. Using the point-to-point structure allows Southwest to maximize its outbound logistics. The point-to-point structure allows Southwest to reduce travel time because the aircraft does not need to stop at a hub. Not stopping at a hub also reduces the amount of fuel, as the airline can simply go to the next stop. Finally, not having a hub reduces the risk of the airline losing a customer's bag because the bags and customers are being loaded together rather than in a hub-and-spoke environment in which the bags can be loaded before the customer is on the plane.

When it comes to sales and marketing, Southwest Airlines has done an amazing job with convincing customers to fly with it. Southwest Airlines has made a profit for the last 43 years, even as the country weathered a major recession in the last decade. This is no coincidence, as Southwest generally tends to compete in markets by creating more marketing schemes to attract more customers. One of the most notable marketing strategies was used in 2007 during the oil crisis in America. The price of oil went up, and many airlines started charging customers for extra bags. Southwest went the opposite direction and started advertising that the first two bags would be free for customers. On top of that, as other airlines charged customers to change flights, Southwest Airlines started advertising that it would not charge customers for changing flights (Southwest Airline, 2013a).

To increase sales and market share, Southwest Airlines created its own frequent flyer program. The program became very successful, as it gave business customers extra perks, offered customers no blackout dates for using the frequent flyer miles points, and offered points that did not expire. Southwest also came up with a tier system called Wanna Get Away, Anytime, Business Select, and Seniors. These systems offered customers the flexibility of having the lowest fare possible while also selecting other tiers based on the customers' needs and preferences.

Southwest treats customer service as a top priority in an arena where customers now dread getting on airlines. Southwest's mission statement says it is dedicated "to the highest quality of Customer Service, delivered with a sense of warmth, friendliness, individual pride, and Company Spirit. We are committed to provide our Employees a stable work environment with equal opportunity for learning and personal growth" (Southwest Airlines, 2013b). There are very few layers of management when it comes to taking care of customers. Associates often have discretion to take care of customers without worrying about what will happen to them. Associates are often recognized for their accomplishments in taking care of customers; some customers are invited to company events to show the airline's appreciation. An example of one of the customer service skills set out for Southwest is the ability for associates to handle damaged baggage claims. In some cities where Southwest flies, it has several types of bags in rooms. If a customer's bag is damaged, rather than having the customer fill out tons of forms or getting the customer to provide an expense report of the value of the baggage and the cost to get it replaced, Southwest simply replaces the customer's bag. Customers pick out a bag, transfer their contents to the new bag, and continue on their journey. This is just another way that Southwest Airline values its customers in the realm of customer service.

The Business Models of the Airline Industry

The airline industry has four basic business models: low-cost carrier, network carrier/partnership, cargo carrier, and partnerships (Appian, 2017). Each of these fills a niche within the airline industry, and the diversity provides multiple options for different kinds of consumers. The first business model is a low-cost carrier (LCC). This model sells the cheapest tickets possible. According to Boeing, "The LCC model focuses on business and operational practices that drive down airline costs. Typical cost-saving practices include operating at secondary airports, flying a single airplane type, increasing airplane utilization, relying on direct sales, offering a single-class product, avoiding frequent-flyer programs, and keeping labor costs low. Such tactics helped LCCs reduce unit cost by 20 percent to 40 percent compared with network carriers." Such models often do not provide the meals and luggage checking available on more traditional airlines. Southwest and Spirit airlines are the top two low-cost carriers in the United States today. Their ticket rates are much lower than airlines like United or Delta. However, they charge for optional services, like early boarding, drinks, movies, extra checked luggage, etc. This is a good option for students, large families, and anyone else on a tight budget. The alternative is to have customers pay a higher overall price but not have to worry about additional micro-transactions. For harried travelers, this convenience can be very important.

The second business model is a network carrier model. Network carriers include some of the largest airlines in the world, such as United, Air France, and JAL. These airlines are continuously widening their networks and creating new alliances with other airlines. These airlines offer domestic, regional, and international services. Their distinct features are their large fleets, airport lounges, onboard meals, and multiple cabin classes. Often, these airlines have been in business for many years and have developed a reputation for quality service, though in recent years they have found it difficult to compete with smaller, more agile, low-cost carriers. However, their recognized brand name and near-monopolies in some airports make them an attractive option for many customers. One of the major features of the network model is its emphasis on partnerships.

According to Boeing (2017), “Airline partnerships, either full alliances or other cooperative arrangements, have become powerful tools for expanding networks, enhancing revenue, and reducing costs.” These partnerships can take many different forms, but the most common tactic is code sharing. Code sharing occurs when two or more airlines sell seats on a single flight under different designators. For example, Airline A might let passengers book a flight from Atlanta to Boston on its site, but the actual flight is operated by its partner, Airline B. Extensive technology is required to coordinate such flights, and the alliances are made possible only by shared database management. Zou and Chen (2017) have shown a “highly significant and positive relationship between the number of code-sharing partners and an airline’s operating margin. According to Boeing, code sharing has grown nearly eight percent in the past decade (Boeing, 2017).

The third model is the cargo model. Cargo can mean several different things, but generally it refers to all non-passenger flights. Besides carrying people, an aircraft can also carry equipment and mail. Mail and packages can also be transported by an aircraft, for example by UPS and the US Postal Service (i.e. airmail). Flight is often a faster and more efficient way of transporting items from one point to another. Carrying freight and mail gives airlines revenue opportunities beyond transporting passengers, but since the planes require different internal configurations, this is limited.

Finally, the fourth business model is partnerships. According to the Boeing (2017), “Airline partnerships, either full alliances or other cooperative arrangements, have become powerful tools for expanding networks, enhancing revenue, and reducing costs.” It is in the best interest of both parties to work together to achieve their goals. The concept is “if you scratch my back, I will scratch yours.” People need other people, which is why the partnerships are so important. The most common partnership tactic in the airline industry is code sharing. “Code-sharing has grown nearly eight percent annually during the past decade” (Boeing, 2017). By partnering with other companies, the industry can profit and grow the industry even more.

Each of the four airline business models caters to a specific target market, from budget-conscious to business. The relatively large number of airline companies means that the industry is increasingly competitive. As budget airlines became more popular and aggressive in the past few decades, larger airlines have increased their partnerships to maintain a competitive advantage. Many costs have been pushed as low as they can go, so now the budget airlines themselves are being forced to look for new ways to innovate to maintain their position.

The Role of Information Systems in the Airline Industry

This section identifies and describes the role of information systems, their use, benefits, drawbacks, and laws and ethical issues associated with use of the information technology. Extensive coverage of the role of information systems and management information systems is not within the scope of this article.

All airlines use information systems in their day-to-day processes (Fournel, 2017; Stair & Reynolds, 2015). Airlines use information systems to ensure arrivals are on time, customers are satisfied with their reservation system and frequent flyer programs, and customers are satisfied with changing fees or baggage fees. Many times, when an airline's information system is not adequate, there is frustration for customers and the airlines, as well. Staying late at a terminal because the airline could not fly on time because of an overbooking issue can cause airlines to lose money and result in customer disappointment.

Information systems plays a vital role in the airline industry as they are used for most of its operations (Fournel, 2017; Stair & Reynolds, 2015). The airline industry has come to depend on information systems to ensure that the airlines are as efficient as possible. Information systems allow the airline industry to schedule flights, schedule crews, pilots, and flight attendants, and meet deadlines that airports often require for airline carriers. The communication between information systems is complex, and a single issue in the information systems can cause damage to the airlines profitability and customer service.

Airlines must constantly ensure they are following strict protocols. Overbooking can lead to customer disappointments, as airlines will have to pay more money because of the overbooking, and they also have to determine how to take care of their customers (Jones & George, 2011). Not booking the right crew for an airline or not having the right crew can lead to delays at the airports, which often costs airlines more money. Airlines must be able to constantly update their websites to ensure there is not a data breach or malware on the site. Data security is a huge concern for the airline industry, as customers are using websites to book tickets. Having the data compromised can lead to legal issues and financial challenges. Overall, there is a complex web that information systems work through, often seamlessly. However, when the system breaks down, it can result in major headaches for the airlines and customers.

As described above, management information systems in the airline industry focus on data pertaining to passengers, allowing managerial and operative decisions that allow the airline companies to achieve their service goals. The operative information systems that the airlines use capture, generate, and transfer critical information for day-to-day operations (Pai, 2007). Information systems are used for flights, passengers, baggage information, crew assignments, and situational and environmental data. The operational information systems are also used for active decision-making, such as having the ability to reroute flights when needed. The information is received from capture points, such as dispatchers, and then generated into data, which is transferred to the various databases (Singh, 2011).

Evidently, information systems in the airline industry improve the efficiency of many aspects of the airlines. For illustration, with information systems providing data concerning

passenger's flights, customer service is enhanced due to the easy access of information for the customers, as well as for the employees who can provide assistance to the customers. Information systems also improve efficiency in the airline industries by optimizing the use of resources, by being able to use data storage to keep track of all resources available and being used and needed (Fournel, 2017). People and planning in the airline industry are able to use information systems to optimize flight plans, fares, schedules, and optimize the amount of fuel used for the airlines, which in turn, allows airlines to maximize revenue. Information and communication systems in the airline industry also allow airlines to respond efficiently to any changes that occur, such as changes in weather that could affect flight patterns and schedules. Information systems also allow convenience for passengers by allowing the passengers to be able to book online, by phone, or even at kiosks in airports.

There are varieties of known and unknown drawbacks to information systems in almost any industry. One of the possible drawbacks of using information systems in the airline industry is the expense that can be associated with the systems. These expenses include startup cost, training of the employees to be able to operate the information systems, and maintenance expenses. The maintenance expenses also go hand-in-hand with another one of the drawbacks that can come from using information systems in the airline industry: the possibility of malfunctions. Henderson (2017) states that malfunctions concerning information systems can include computer failures, which can lead to flight cancellations, unhappy customers, and, possibly, a decrease in revenue for the airline. Use of information systems could also lead to the elimination of certain jobs in the airline industry, such as automated voice systems taking the place of employees. Information systems could also lead to the alienation of clients due to the same reason: some clients would rather speak to a real human than an automated voice system.

Although there are numerous laws dealing with airline industry and specifically the information systems, most prominent laws concerning information systems in the airline industry include those for passengers in the industry itself; safety laws are the main ones. With the usability and efficiency that customers are able to experience through the use of the information systems pertaining to their flight information, passengers could wish to access this information while on their flight at any time they wish. This is not possible, though, because of the current law, which does not allow passengers to operate cellular devices at certain times during flights. Furthermore, Cederholm (2014) states that there are also laws covering the events of air crashes due to flawed information systems and how those events are to be handled.

Clearly, there is an assortment of ethical issues relating to information systems within the airline industry (Bowie, 2002; Donaldson, 2001; Smith & Hasnas, 1999). Within the aviation industry, drones are becoming more abundant and operational. With this arises the concern from people that the technology used in the drones is so advanced that it is not ethical. According to Mcguiggan (2012) and many other researchers, one of the main ethical issues pertaining to information systems in the airline industry concerns security breaches. With operating systems containing all of the information pertaining to the airlines, hackers are able to access that information much easier than when it was all in hard copy format. This could lead to the security of that information being compromised. Another ethical issue is that information systems could

potentially provide passengers with misleading information pertaining to their flight, which could lead to multiple problems for customers.

Airlines are often rated from being best to worst depending on several customer satisfaction factors. Customers rate airline industries based on customer satisfaction, arrival times, cabin comfort, frequent flyer programs, baggage fees, fares, number of flights, overbooking, and fees. Most of the customer satisfaction issues that customers expect are directly based on how well airlines use their information systems in their daily activities. The most popular three airlines that were rated high in February 2017 by Julian Mark Kheel (Kheel, 2017) were Alaska Airlines, United Airlines, and Virgin America. These airlines proved that their use of information systems was strong, as customers enjoyed the airlines on-time arrival rate. Customers also enjoyed the fact that these airlines made traveling easy, using information system to handle frequent flyer programs and change fees effortlessly. Because of the strong use of information systems, customers had fewer involuntary bumps and instances of lost luggage.

The three least popular airlines that were rated were Hawaiian Airlines, Frontier Airlines, and Spirit Airlines. Hawaiian Airlines has a good on-time record, but customers claim that it has poor frequent flyer programs and high fares, which resulted in poor customer service. Frontier and Spirit airlines are low budget airlines and, thus, spend less on information systems. Low spending on the right information system has led both companies to have late on-time arrivals, which has led to low customer satisfaction. Also, the low-cost airlines utilize information system in such a way that there are issues for customers, such as having to pay more for baggage and change fees.

Framework of Competition within Airline Industry

As the prior section describes, the airline industry is a highly competitive industry (Kleymann & Seristo, 2017). In this section, the authors attempt to briefly illustrate a high-level analysis of competition within the airline industry utilizing Porter's Five Forces Model (Porter, 2008), which is an acceptable framework for analyzing the level of competition within an industry. Porter's Five Forces Model consists of (i) Bargaining Power of Customers; (ii) Threat of Substitutions; (iii) Bargaining Power of Suppliers; (iv) Threat of New Entry; and (v) Rivalry.

Bargaining Power of Customers

After the deregulation of the airline industry, fares dropped, and, soon, new airlines entered the aviation industry (Gudmundsson, 2017). Airlines soon had to be concerned with profitability, as there were no more guarantees of profits from the United States government. Now there are several airlines for customers to choose among when wanting to fly to a particular destination. Airlines now have to compete at different levels to ensure customers keep coming back to fly their particular airline. Customers now have a great amount of bargaining power when choosing an airline for domestic or international flights. Some of the bargaining power comes from travel agencies, loyalty programs, low-cost carriers, and different transportation methods.

Customers can choose several physical travel agencies to find the best fare or they can use travel agencies that are online, such as Travelocity or Expedia. Customers are choosing to use more

of the travel agencies online because of the ease of using them right from home. These travel agencies are often assimilated with the airline industries to provide the best prices for customers, often within seconds of typing in a customer's destination. Loyalty programs are often provided by the airline industry for repeat customers. Airline companies often give loyalty points to consumers for free flights with their airlines or other amenities, such as lounges in airports for consumers to use while they wait on their flights. Loyalty points are also often provided by credit card companies. Consumers can now choose to use a credit card to purchase personal products, and the points can be used with their favorite airline (Delbari, Ng, Aziz, & Ho, 2016; Doğan, Dilan, & Aydm, 2019).

Low-cost carriers, such as Southwest Airlines or Spirit Airlines, have come into play for consumers and provide low-cost rates for no-frill flying. Often, these airlines differentiate themselves from legacy airlines, such as Delta Airlines and American Airlines, by providing services to destinations at a very low cost for consumers who are willing to pay for extra services, such as allowing extra bags or providing assigned seating. Finally, consumers also can use different transportation methods to get to a destination. Consumers can use the bus, train, car, or boat to get to destination that can be cheaper and more pleasant to use than flying for travel.

Threat of Substitutions

Threats of substitute forms of travel that compete with airlines include rental cars, busses, trains, and boats. However, there are other forms of substitution in the technological era, such as video conferencing, that consumers are using rather than flying to a destination. Environmental factors also contribute to the threats of substitution as well (Button, 2017; Rahman, Azad, & Mostari, 2015). If, for example, there is bad weather (high winds, snow, thunderstorm, etc.), consumers may choose to use a different form of transportation than flying because of the delay that flying could cause. Sometimes, it may also be faster to drive to a destination that is not far away because of the time it takes to get to the airport, go through security, and, finally, get on the plane.

Bargaining Power of Suppliers

The bargaining power of the airline industries is the result of the airlines themselves, labor, and fuel (Sinha et al., 2017; Helleloid, Nam, Schultz, & Vitton, 2015). Currently there are two major manufacturers for airlines, Airbus and Boeing. Because there are two companies making airplanes, the airline industry cannot easily switch airplane manufacturers. Often, these airplane manufacturers have long-term loan agreements for more favorable credit terms and, thus, prevent an airline from switching manufacturers. It is also very difficult for other manufacturers to enter plane manufacturing because of the enormous capital required. It can cost over \$200 million dollars just to produce one plane; thus, there are very few suppliers in the airline industry.

Fuel cost is constantly changing because of various factors in the market. To prevent extreme price changes, the airline industry hedges fuel costs so that they will save money when the market increases fuel prices. Hedging generally saves the airline industries money when prices are going up, but when prices start falling, the airline companies do not save money because the

price of the fuel had already been locked in. The bargaining power of the labor unions could also affect the bargaining power of the airline industry (Beladi & Mukherjee, 2017). Airlines must deal with labor unions that strive for better pay and better work conditions. However, if a certain part of the labor union, such as pilots, flight attendants, or mechanics, go on strike, the airline companies are forced to shut down.

Threat of New Entry

The threat of new airlines coming into the airline industry is very low because of the vast amount of capital needed to enter the market (Ciliberto & Zhang, 2017). Airline industries must not only purchase the actual airlines, but they are also responsible for the labor pool that is required to run an airline. Even if a company does decide that it has the capital for expenditure, they must also get proper licenses and regulation clearances from both the Federal Aviation Administration and the Department of Transportation, which could take over a year to achieve.

Companies that still want to enter the airline industry must find niches to grow in because of dominant players in the industry (Parise, 2018). Much of the industry is in competition with airports and the number of airplanes that can be handled by the airport. Some airlines may not even be able to fly out of an airport. Companies that are lucky enough to enter the airline industry and find a niche may find themselves without profits for a few years until customers start buying airline tickets from them. Consumers are hesitant to purchase expensive airline tickets with unknown airline companies. They often will purchase from airline companies that they know and which they are comfortable with.

Rivalry

Rivalry within the airline industry is high, as airlines compete for customers through loyalty programs and amenities (Kleymann & Seristo, 2017; Araujo & Kjellberg, 2016). Low-profit margins and high costs keep airlines keenly aware of fuel prices that are constantly fluctuating. Airlines in the United States are competing with airlines in the Middle East, especially when it comes to international flights. The fuel costs for airlines in the Middle East are often cheaper or government subsidized, giving those airlines an edge over United States airlines. The expansion of low-cost airlines, such as Spirit, Southwest, and JetBlue have created a rivalry among the major players in the airline industries, such as Delta and American Airlines. Low-cost airlines compete by often flying from smaller airports with fewer fees; they also often offer fewer amenities to cut costs.

Concluding Inferences

Generally speaking, in the late 1970's the United States government held most of the control in the early stages of the airline industry. It was a rigorous field to get into, and, once in, there were many stipulations that had to be upheld. With fears of bankruptcy in 1978, the United States government deregulated the airline industry. Shortly after, private companies began to figure out how to implement information systems and technology to maximize their revenue. Airline

companies compete with one another in numerous ways just to be number one. Specifically, companies use the prices for flights and bags, as well as reward services that offer credit cards and frequent flyer discounts. In addition, Porter's Five Forces Model helps different airline companies figure out their positioning so that they can execute their competitive planning efficiently. There are many parts of information systems that utilize value chains involving inbound logistics, operations, outbound logistics, sales, and marketing. Southwest Airlines is a good example of the implementation of these values. Furthermore, information systems are used in many other aspects of airlines. For example, programs within information systems help to ensure on-time arrivals and quick, efficient reservation times; many other programs that warrant customer satisfaction are used. Within these systems, there can be issues that can cause overbooking or even security problems, which can trigger complications and frustration. Ultimately, information systems are an active part of airline companies and will continue to make things more efficient through advancements to ensure customers satisfaction as well as a very competitive field.

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