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The Impact of Innovative Technology on the Aviation Industry and on Customers Preference

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Abstract:

Purpose – The purpose of this paper is to investigate the impact of innovative technology on the customer preference in terms of selecting an airline in the Kingdom of Bahrain. The aim of is to understand the aspects that impact the customers selection of an airline.

Design/Methodology/Approach – Travelers in the Kingdom of Bahrain were chosen randomly. The selections were on both Bahrainis and non Bahrainis. The study has investigated several technologies that are currently being used by airlines in other countries and how adopting them impact the behavior of the customer in terms of selecting an airline. The distributed questionnaires are aimed to know the which factors impact the decision of the traveler when it comes to selecting an airline and if the technologies will create an impact if adopted.

The questionnaires also solicited demographic factors and disclosed information regarding the types customers their monthly income and how often do each individual of the population travel. The questionnaires are designed to reveal the frequency, extent and acceptance in the utilization of technologies found that aren't currently used in the carrier available in the Kingdom of Bahrain.

Findings – After evaluating the response from the 382 individuals from the Kingdom of Bahrain, the study found that the results reflected a positive reasonable relationship between innovative technology customers preference in terms of selecting an airline. The results showed a good acceptance level of the proposed technologies that are specified in the questionnaires.

Evaluating the responses from 382 individuals of Bahrainis and non Bahrainis, the study found that the results reflected positive reasonable relation between innovative technology and customer's preference in terms of selecting an airline. Among the respondents 52.6% were males and 47.4% were females. Out of the 382 respondents who participated in the survey, we categorized the age of the respondents into four categories – 19 and below, 20 – 29, 30 – 39 and 40-49 years. A total of 138 (36.1%) of the respondents are aged 19 and below, 154 (40.3%) were aged between 20 to 29 years, 11 (2.9%) of the respondents were aged between 30 to 39 years and rest of the 79 (20.7%) were aged between 40-49 years. So, peoples aged between 20 years to 39 years are participated more in the study while people aged between 30 to 39 had minimum representation in the study. (65.7%) respondents in the study were Bahraini while 131 (35.7%) were non-Bahraini. A total of 73 (19.1%) of the respondents travel once a year, 160 respondents (41.9%) travel 2 – 3 times a year, 74 (19.4%) of the respondents travel 4-5 times a year and rest of the 75 (19.6%) travel 6 or times a year. People who travel between 2-3 times per year participated more in the study while people with who travel once a year had minimum representation in the study.

Keywords: Innovative technology, customer's preference

1. Introduction

The aviation industry compared to other business sectors the aviation industry does not have a long his. It is almost impossible to provide a specific date which is the starting point of the aviation business it is compulsory to mention that the Wright brothers who conducted air flights which are powered back in 1903 and only by that it sets the basis for personal aviation (Sheehan & Oclott, 2003).

Several years later the previously mentioned flight, a German manufacturer generalized in aircrafts Zeppelin was the founder of the first aviation company. November the sixteenth 1909 the Deutsche Luftschiffahrts Aktiengesellschaft (DELAG) has been established to operate flights for passengers from Frankfurt which the base of the company which is now called the HUB (Sheehan & Oclott, 2003) Agosti and Bieger (2005) have developed a four-stage model which is consisting of the how airline business evolves and also this has been divided into four parts. In the first initial phase which is called the technical

stage and it end at the of the Second World War. Traveling by air in those years was rather considered as an adventure. The business was a supply side business which aviation industries were hardly making any profit. The following second stage is called the political stage which consists of establishing the international agreements, standards and regulations which were set for the industries of transport in 1950 an important achievement in technology was made, it was the jet planes which allowed aviation to start a significant growth.

The aviation industry started to put more effort and concentration on the cost and quality back in the 1970s. This has shaped the third stage by introducing policies of the open sky pricing schemes, services and the new competitors entering the market with concepts considered to be new for the business. The final stage which consists of alliance and network started in the 1990s which has introduced the lost cost carriers and the alliance formation process among carriers that were already established, this stage has changed the market conditions completely. In the European continent, new low-cost airlines that were established took advantage of the open European skies and have successfully managed positioning themselves in the aviation market. Accordingly, and at the same period several old firms and carriers faced severe problems, which were due to finance? (Robert Wilfing, 2012)

2. Introduction to Innovation

Innovation today is almost used for business models by almost every company. It is noticeable how the worlds leading firms and companies such as Starbucks and amazon benefit from such model to the unique method they follow by marketing ordinary products with a special added value (Trends Magazine, 2013). Accordingly, innovation has changed its aim from products new development or a new process to focusing on increasing the customers experience by accumulating a value to a product that already exists. Innovation is the development process of introducing products with new specifications or a new process to the world in a specific field, market, or a specific industry (Reilly & Tushman, 2004).

The aviation industries are well known for being innovative, as they must develop strategies and implement innovative technologies to gain competitive advantage. In the past decade, the competition in the airline industry has been increasing rapidly when it comes to offering innovative products and innovative services along with technologies introduced in both airports and aircrafts (Southwest, 2012). Although this specific industry is not always stable, its profit is considered as the highest among other industries. Therefore, companies must employ new strategies, which contain lots of flexibilities in order to keep along with the market that is constantly changing market and to be different from the competitors. This what makes understanding trends in innovation very important among other airlines (Wensveen, 2008).

Industries are now in need for flexible business strategies in order to survive. In the past decade, aviation industries entered are focusing on ways to maximize their revenue. Since 2005 airline industries continuously thinking of ways to be innovative. Airlines focus in being different so it enables them in becoming market leaders. Most of the innovations raised during this period came from the several low-cost strategies (op. cit., p. 57).

In order for companies to survive, they need an essential tool, which is Innovation. Nowadays firms have an easy access to new technologies used, and information that can be categorized as a very important factors for the economic growth.

2.1. Definition of Innovation

The researcher Manuel Agrela (2013) stated in his research that the first definition of innovation was by Joseph Schumpeter back in 1932 was the first to define innovation "a new combination of things that come to market", which is categorized also as products and the methodologies of producing them and offering them to the market in new ways. (M. Agrela, 2013. & Sundbo, 1998).

The Researcher Agrela (2013) commented further as innovation should be constraint under the term new things and it claims that is has to be considered as more then implementation of new concepts. If a firm practices a knowledge that already exists or an existing invention for its detailed needs, it should also be considered innovation since the product or service appears in a new way or a better shape than it was originally introduced. The firm can also implement innovative idea and structure to its business in order to tackle a specific need. Let's take an example of how innovation can be introduced in business activities within the aviation industry itself. Since most airline travel to close by destinations which do not require a layover and that the aircraft used for the sector itself returns back to its base directly after the flight, this process actually decreases the expenses on the airline on the airline company and provides the operating cabin crew a normal lifestyle. Hence, is it not essentially important for innovation to come into a market as long as it covers the need for adding value either for customers or the company. (op. cit., p. 9).

The ultimate tool to make innovation possible is invention. It is the initial existence of an idea for a something new which could either be a product or service, product development or even a new process. That's when we know that an innovation is possible. However, a different combination of capabilities, resources, skills, and knowledge are what determines the possibility of innovation. An innovative process or a product had to be introduced and offered to the public or to be used within a production process to covers the need of the market or the for the benefit of use within the firm. Thus, an invention can only be considered as innovation, when the market or other corporates benefit from the service or product (Sundbo, 1998).

Another can consider another example in the same field, when the famous inventor Leonardo da Vinci had idea about airplanes, which at the age were completely ahead of its time, which back seemed reckless. The lack of materials, power source and other sources, Da Vinci was not able move forward with ideas he had and applies them to reality.

Furthermore, his ideas and philosophies were very complicated if not impossible to apply, until the invention that made it all closer to reality and more possible to achieve, it's the combustion engine. It is now more obvious that innovation is concerned within the manner of abstracting the value from ideas or in other words gaining beneficiary outcome regardless to the customers or developers. Accordingly, some innovations can only be done due to previous ideas and inventions. (Agrela, 2013)

2.2. The Innovation Cycle

It is a structure that is set by the researcher Schoen et al. (2005) and was recognized for the Model for the Innovation Process of invention. Targeting the thoughts directly at the technological incubators manager and the decisions makers, (Opt 2005) explained that the previously done models of the project management were not complete and rated them as in the innovation cycle as incomplete representations.

Schoen al. (2005) further explained that these processes are not always necessarily defined strictly. Project management models, which have been done previously, the authors, argued that there should be outcomes, which are well defined, and therefore it helps into proceeding towards the other outcomes. The researcher continued and later then introduced the new model, which is named as the Spiral Model. This was again however borrowed from the systems development spiral model, which was explained further by another researcher. Schoen al. (2005) continued and discussed that best used model and more sufficient is the Spiral Model is used best and more sufficient when used in management models done previously in the development cycles as the development process the outcomes are not well defined and unclear.

Schoen et al. (2005) noted that the decision makers when it comes to technology often deal with technologies that do not have an outcome which is certain and may not meet the project goals, expectation or even the timelines; and that these technologies which have been adopted are some recommended from university researcher's dissertation. This means that the starting points of these projects are unclear.

Schoen et al. (2005: 8) have described further that innovation "is not a step-by-step, set the pins up and knock them down type of operation and requires mating a good idea with an even better concept". This concept was initially from Albert Einstein which believed that innovation was isn't a product thought of the logic, even though the result was linked to structural logic. Schoen et al. (2005) had thought that in this regard the other researchers Hamel's (2000) assertion that innovation represents the accomplishment of breaking free from mental constraints.

Customer satisfaction in the term of business is identification of how much the customer is satisfied towards the product or service the company offers. In an era where the competition is intense, all businesses try to achieve customer satisfaction tries where in such market it is considered as the key elements of success for all businesses. (Tahir Naveed, 2013)

In order to gain maximum, the satisfaction of the customers, the firm has assured the customers safety as each customer requests safety. Customer satisfaction has a positively influenced positively (Anderson and sallivam, 1993). Customers tend to become loyal and satisfied if the company provides a service or a product according to the customer's requirements. One of the key components to customer satisfaction is innovation, the main aim of adopting innovative technologies by companies is to satisfy their customers and meet their expectation.

Most of the time customers are aware of the companies' behavior related towards their customers complaints and whether these complaints are taken seriously and followed up by corrective actions or not. (Tahir Naveed, 2013)

Anderson and Sullivan (1993), argues that in order to keep the customer coming back to your service or product you need to keep him satisfied. Handling the complaints quickly and efficiently will lead subsequently to loyalty and minimize the customer's negative impression. Although many establishments provide products and services to the customer which are considered as high value, they somehow undergo some difficulties and this arises due to the lack of customer interaction which subsequently leads to failure in understanding the exact information about customer needs due to lack of understanding in the change occurring in technology and trends.

According to the researchers that elaborated further that sometimes Even though companies provide a very high quality of features in their products or services, these companies fail to achieve customer satisfaction. And the reason behind that is basically that these features are not important or do not have any value to the customer (Lacobucci, ostrom, Graysan, 1995). This problem rises due to the lack of customer communication. As companies lack direct interaction with customers about the services and products they offer to the market and how much the customer is satisfied when it comes to the product. Instead, they transform the product or modify it according to initial studies which are incomplete. (Tahir Naveed, 2013) In many situations if the company interacts very little or has no communication with its customers then the retailer or in this case the travel agent or local office authorized plays a vital role in enhancing the customer satisfaction. The local office authorized or the travel agent should always treat the customer as a representative of the company itself. (op. cit., p. 5)

Customer satisfaction has a strong influence when the firm's employees interact with its customers (Boshoff & Tait, 1996), the examination of the behavior of the employees is considered very critical. On the same hand the operating organizational culture has a high influence on the behavior (Schein, 1996), a focused assessment on the quality of service reflects the perception of the consumer in five specific service dimensions.

On that same hand, a comprehensive view of the satisfaction of the customer is determined by the perception of service and product quality along with the prices, situation factors and personal factors (Zeithaml & Bitner, 2001).

Customer satisfaction has become an essential component in the operations of service because of the huge value it produces to organizations (Ranaweera and Prabhu, 2003). Researchers Shin and Elliott (2001) elaborated further and stated in their research that the importance of customer satisfaction is consequential result of a philosophy that has been frequently approved on that Satisfying the customers is the key factor in order for a business to be successful and profitable.

Previous research has verified that satisfaction is strongly associated with re-purchase intentions Customer satisfaction also serves as an exit barrier, helping a firm to retain its customers (Fornell, 1992). Another Research conducted by Blodgett, Wakefield, and Barners (1995) have concluded that it costs more to gain a new customer than it does to retain an existing one. In addition, gaining customer satisfaction will leads to favorable word-of-mouth publicity that provides valuable indirect advertising for an organization (Fornell, 1992).

Many companies define having satisfied customers as that the organization receives fewer complaints. in most fields it means that subsequently the organization is tended to receive less complaints. Hence, reducing costs in handling service failures. Researchers also have observed that satisfied customers are willing to pay more for the benefits they receive and are more likely to be tolerant of an increase in price concluded that, through satisfying customers, organizations could improve profitability by expanding their business and gaining a higher market share as well as repeat and referral business. (Fornell, 1992)

In a very aggressive environment the key to gaining a competitive advantage is being innovative. The ability to innovate or adopt innovative technology has a direct impact on the organizations ability to compete against its rivals. (Neely, A – 1998)

As researcher Rana Mostaghel (2006) described that in order to have a thorough customer happiness and loyalty, it is important to have working condition which is described as above average which is needed to have employees which are satisfied which will subsequently lead to loyalty of employees.

Only by preparing such environment the good production will subsequently follow and accordingly have an affection on customer the satisfaction of the firm's customers and earn their loyalty and only by retaining the customer the company can retain its high revenue and build a profit on.

2.3. Technological Innovation

Technology is converting innovation at its core; industries now can implement new ideas and prices that were impossible to believe a decade ago. Features can now be updated on a firm's website and receive a respond from results of how customers respond to it within hours. Results are also available to preview from promotions offered, productivity of a certain service and the efforts to boost it. There will be even better payoffs for customers: Their likes and dislikes will have much more impact on companies' decisions. In globally competitive markets, they will ultimately end up getting products and services better tailored to their needs. (Brynjolfsson, 2009).

Already, this powerful new capability is changing the way some of the biggest companies in the world do business, inspiring new strategies and revolutionizing the research-and-development process. Growth of companies by the use of innovation is essential. Globalization has caused the increase of international competition and subsequently it changed the innovation needs. Companies nowadays have access to information easier than before and also have easier access to market and technologies; this knowledge is categorized as the economics growth and innovation great factor (Oslo Manual, 2005).

New technology obvious factors of adoption and its benefits received by the user and the efficient cost of adoption. Multiple cases indicate that these benefits are simply considered as the main factor of the difference in profits and revenue generated when a company transfer from an old technology to a more advanced one, of course when it comes to consumers, the increased utility from the new product is the main factor of benefit, (Hall & Khan, 2012) As long as customers distinguish the product or service as new one then the product can be considered as innovative produce (Schiffman and Kaunk, 2001). Company with innovation capabilities will replace the market if the business doesn't conduct product innovation (Millett, 1990).

Innovation in products and services are becoming very important in order for an organization to continue it growth and its sustainable existence. From all perspectives of different scholars, both products with innovative technology and existing products which are introduced, copied and developed are considered as product innovation as long as the new product could meet the new demand of a market and be differentiated from existing products such as different style, material and procedure. Product innovation does not necessarily mean a new invention. Agrela (2013) has identified innovation and agreed to the definition of Tseng (2010) which both stated that it is not important for innovation to be a new invention. However, as long as it adding a value for either for customers or the firm by adding a new service that was not previously introduced.

2.4. Improvements in the Old Technology

The researcher Rosenberg (2006) had argued and some concerns regarding the act of substituting older technologies for an updated one or a new module. When a new technology at times is an innovation that's close for an existing technology substitution, then the innovation for itself may encourage providers of technologies that are old to make improvements or

engagement in other types of competitive behavior in an effort to retain their market position. This in turn will slow the diffusion of the new technology.

2.5. Technologies: Radio Frequency Identification RFID and Its Historical Overview

Radio frequency Identification RFID was originally used as military identification systems and was used and implemented during the tragic Second World War, its main purpose was to identify planes. The system used is known as the identification system of Friend or Foe IFF. (Bekir Bilginer & Paul-Luis Ljunggren, 2011)

The Radio frequency identification technology has been developed further to enable the use of low cost commercial use. Its initial developments were tags that have been used for surveillance. It consisted of two main statuses, which was on and off, if the state has not been switched off an alarm would go off if the tag passes an electronic reader. The existence of the first tags was Passive but with time and introduced also the active tags. RFID is nowadays a well known and spread to almost every mega or small business. This technology is being used in all over the world. (op. cit., p. 3).

2.6. The Use of the Technology in the Aviation Industry

Radio Frequency Identification (RFID) is a wireless information exchange over short distances technology. This technology has been invented for almost five decades ago, recent development in organizations has made the RFID devices to finally start showing its potential (Bite, 2010)

The researcher Katalin Bite (2010) elaborated further on RFID, explaining that it's a technology merged into a silicon chip that produces radio signals which matches a user-defined serial number with an item. In this case the item is a piece of check-in baggage.

This number can be read at a distance by an antenna. The RFID also has many following characteristics as it enables the baggage to be sorted automatically and loaded faster than with barcode systems, while reducing the number of mishandled baggage and its associated costs at the same time. (op. cit., p. 126).

Wyld (2005) focused on a specific airline in the United States and how RFID technology could improve the service provided to the customer through better operational efficiency in baggage handling, which has been demonstrated to be an essential component of an airline's customer service rating. Even though the value of this technology in handling passenger bags is accepted in general at the industry, the adoption of these is stalled by concerns relating to their inadequate return on investment. (Bite, 2010)

The researcher Bite has compared the barcode and Radio Frequency Identification which has been listed in the table below in detail comparing several main attributes such as the optic view, reading possibility, read rates accuracy and where each is placed in terms of baggage. While the barcode is easy to remove the RFID is almost impossible to remove without destroying it. The below table also compares the speed of response.

The researcher Katalin Bite (2010) has observed the difference between the traditional Barcode, which is mostly used by major airlines and the RFID in the terms of being implemented in chain of handling baggage at the airports.

Near Field Communications NFC Two major companies Philips along with Sony initiated the initial development of near field communication. The technology consisted of a protocol and an interface which were developed on top of Radio frequency identification that makes the device which is connected NFC a part of this standard and compatible with a radio frequency technology that already exists. (Bekir Bilginer & Paul-Luis Ljunggren, 2011)

The main key feature that makes a difference between Near Field Communication NFC from Radio Frequency Identification RFID is the possibility of transferring information, which allows communication between two NFC devices. In order to connect between one device to another the two devices must be close to each other or physically touch each other devices physically. The Near Field communication NFC then automatically configures itself and communicates in a peer-to-peer network. (op. cit., p. 12).

Near Field Communications (NFC) is a short-range wireless technology that allows mobile devices to actively interact with passive physical objects and other active mobile devices, connecting the physical world to mobile services in ways that empower and benefit users. We will also be using the term "Tap 'n Go" because it clearly conveys a visual image in which this technology is intended to be used for.

The aviation industry is one, which has a lot of levels in its processes between passengers and the airport and passengers or the carrier itself. IATA conducted a Corporate Air Travel Survey (2009) concluded that 50 percent of passengers around the world prefer more self-service options to fast track the travel always Staying Connected Mobile technology has impacted all phases of the travel life cycle. With advanced wireless networks, growing worldwide adoption of web-enabled full feature phones, smart phones and tablets; passengers are no longer tethered to a desktop PC, but now have instant access to information anywhere, anytime from multiple devices. Mobile technology provides airlines an opportunity for continuous engagement across the travel life cycle

The always-connected passenger has an evolving set of requirements and expectations for information and services. This paper reviews how mobile technology is being used today by major carriers worldwide and what is coming in the near, mid and longer-term future to improve passenger efficiency, increase loyalty and drive incremental revenue. (Amadeus, 2014).

The literature shows how innovation and innovative technology has changed the way organizations compete, the research will be conducted in order to understand the relationship between customer satisfaction and the innovative technology provided, subsequently knowing if the innovative technology is the reason most people select a carrier for their travel.

3. Results

Evaluating the responses from 382 individuals of Bahrainis and non Bahrainis, the study found that the results reflected positive reasonable relation between innovative technology and customers' preference in terms of selecting an airline. Among the respondents 52.6% were males and 47.4% were females. Out of the 382 respondents who participated in the survey, we categorized the age of the respondents into four categories – 19 and below, 20 – 29, 30 – 39 and 40-49 years. A total of 138 (36.1%) of the respondents are aged 19 and below, 154 (40.3%) were aged between 20 to 29 years, 11 (2.9%) of the respondents were aged between 30 to 39 years and rest of the 79 (20.7%) were aged between 40-49 years.

So, people aged between 20 years to 39 years are participated more in the study while people aged between 30 to 39 had minimum representation in the study. (65.7%) respondents in the study were Bahraini while 131 (35.7%) were non-Bahraini. A total of 73 (19.1%) of the respondents travel once a year, 160 respondents (41.9%) travel 2 – 3 times a year, 74 (19.4%) of the respondents travel 4-5 times a year and rest of the 75 (19.6%) travel 6 or times a year. People who travel between 2-3 times a years participated more in the study while people with who travel once a year had minimum representation in the study.

The evolution of technology has enabled the airline to provide an efficient service, the portable innovative technologies have become very important to gain the customers loyalty and maximize the satisfaction, which enable users to choose and allocate their services in terms of seat allocating or even in tracing personal baggage.

One of these studies main objectives is to understand the behavior of consumer when it comes to selection of an airline whether it's a low cost or a high cost airline. This study also focused on answering the problem in whether or not the innovative technologies have an impact on the customer choice behavior. The conclusion of the carried out distributed surveys on the population of Bahrain has outlined that innovation and innovative technology are important with regards economic growth and increase in revenue. As the analysis has shown that it is in fact a reason that determines whether the most will select an airline or not.

It's important to understand how passengers make their decisions as this has also been outlined in this research and this data were obtained from the survey. As airlines should be nowadays more alerted and proactively responsive to the constant changes. It's vital to understand the customer decision behavior and analyzing the decision made by the customers in order further understanding the innovative technology impact on the decision.

The outcome of the data analysis of the distributed surveys has proved that the majority of the respondents would make their decision based on the innovative technology available in the chosen carrier. As the test conducted proves that there is a relationship between customer preference and innovative technology. However, the result has also showed respondents also highly take into consideration the ticket prices and fare regulations.

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