

Development of Airlines' Distribution Capabilities

Ghada A. Hammoud¹, Hala F. Tawfik² & Rasha S. Fahmy³

Abstract

Airlines' distribution testify different methods of developments and implementation of new ideas related to airlines' products or models to meet customers' needs and create new desires for using the innovative means of communication to make the travel experience easier. Such methods of innovation rely on the evolution of information and communication technology that enhance and construct better field of communication. The examples of direct and indirect distribution approaches through both traditional and innovative capabilities will be exposed and in this research paper that will emphasize the development of distribution capabilities is creating new perspectives in allocating airlines products based on personalization, standardization, and expose to solve the existing distribution challenges. Airlines' enhancements of their Passenger Services systems considered to be the fundamental phase of development process, alongside the change of global distribution systems strategies and business model to manage the huge transformation in distribution trends. Airlines are recommended to cope with the initiatives of adapting and deploying the new distribution capabilities to get the maximum benefit of common transmission standards shared between partners, through using the application Program interface across, that will lead to further reduction in distribution costs in a transparent technique across all channels in a personalized perspective.

Keywords: XML-data Base, Big Data, Personalization, New distribution capability, Dynamic Pricing, Standardization, Retailing, ancillary Services.

Introduction

The past 30 years, airlines were the model that exposed to use electronic devices to conduct their daily business before the revolution of the internet in 1990s. Since then, they faced several problems in distribution that forced them to develop and invest in new distribution capabilities to deal with the new customers' advanced technological level with high expectations. The airline booking processes had become more complicated, travel agents wanted more accessibility to airlines' inventory of schedules and fares and ancillary services so they could automate their side of the booking process. Airlines have proactively responded to the changing in customer model and travel agents viewpoint. (www.crankyflier.com, 2013; www.tnooz.com, 2013). Unfortunately, there were multiple challenges in distribution capabilities faced by airlines through the traditional distribution systems, besides the tremendous increase in cost that affect their revenue. Development of distribution capabilities offer new concepts of customization and personalization whether direct or indirect capabilities through third party vendors that will reduce the cost and enhance the revenue. The enhancement of information technology and data transmission allows new opportunities for distribution.

¹PhD, Professor, Dean of Faculty of Tourism and Hotel Management, Beni Suef University, Ex-Vice Dean of Post Graduate Studies and Research, Faculty of Tourism and Hotel Management, Helwan University. Address: 1, Abd el Aziz Al Suood, El Manial Cairo, EGYPT.

²PhD, Professor, Head of Tourism Department, Faculty of Tourism and Hotel Management, Helwan University. Address: 1, Abd el Aziz Al Suood, El Manial Cairo, EGYPT.

³MSc in Aviation Management, Faculty of Tourism and Hotel Management, Helwan University. Address: 1, Abd el Aziz Al Suood, El Manial Cairo, EGYPT.

New protocols as Extensible Markup Language (XML) improve the interactions between passengers and airlines in the areas of pre- and in-flight services which made IATA to adapt a new standard of New Distribution Capability (NDC) to simplify the business and improve the collaboration between industry suppliers and airlines using the new technology trends and data transmission used in distribution (Thurston, 2016; Malhartra, 2015)

1. Airlines' Traditional Distribution Capabilities

The past decade, the commoditization of airline's inventory has amplified through Global Distribution Systems (GDS), Online Travel Agents (OTA) and meta-search that make them now forming a double edge weapon, one side they are crucial for distribution and on the other side they are very costly and minimize airlines' marginal profit. Ancillary services were the only way to fine-tune this situation, where airlines can sell a bundle of additional services that sum up to the original ticket price; extra luggage, legroom, front seat and in-flight WiFi (www.forbes.com, 2016; flightglobalevents.com, 2017).

Airlines used to invest in their lifeblood systems, the Passenger Service System (PSS) that is fundamental for operations and distribute their products through different distribution capacities whether directly or via third party interface like travel agents, GDSs, internet booking engines and Meta-search engines MSE or even bilateral interline bookings with other airlines and codeshare agreements. Other supplementary systems like passenger touch-points, retailing, loyalty programs and customer relationship management have to be linked and integrate together to help and be in connection with the functionality of the core operating systems, to enhance the selling and distribution funnel. In the way, they can introduce and deliver their offers and services as a competitive product to the targeted customers' through Omni channels, and have the accessibility to sell ancillary services and products on board. Airlines invest a lot in improving the information technology of their operating systems and distribution capabilities to simplify and facilitate the interaction with customers and are proactive in offering many solutions to get the maximum benefit of selling and distributing with minimal effort and less time (Cooke, 2017; sita.aero/horizon, 2015)

The current direct interface is always in movement to meet the customers' expectations and to fulfill their needs; as long as the development wheel is moving, new entrance of technology solutions will emerge and what is considered innovation these days will be traditional later. Previously, 80% of airline product was sold and distributed through traditional travel agent prior the existence of airline websites, the introduction and shift of airlines' distribution to their own websites decreased this percentage to 50% and the travel industry witnessed a new Era of cost reduction through the introduction of new customer touch points (kiosks, smart mobile, social media, etc.) Over the past decade, airlines were having an advantage as websites enhance the capability of personalizing products and enrich the end-user shopping experience by mixing and matching what suit every individual customer in a way of the introduction to the merchandizing capability (Belobaba, 2016; Amadeus.Com, 2017).

Distinguished airline website can be measured by the attribution of the differentiated product deployment. Tailored sales to specific customer and his needs prove the tremendous shift in buying patterns over the past decade, airlines are now seeking to deliver a great value as well as the indirect channels to develop their concept of retailing and go beyond than just selling a seat to make the trip more comfortable and exciting for travelers' throughout the whole journey and more collaborated and beneficial for third-parties. Today's personalizing the trip experience by selling services such as (bag fees, in-flight Wi-Fi, extra legroom, preferred seating, airport lounge, etc) with extra fees is not enough although it is widely deployed. This business model was first introduced by low cost carriers (LCC) they made fortunes as they eliminate the intermediaries and enhance their revenues by offsetting the decrease in the original ticket price (farelogix, 2010).

In fact, Merchandising is stretched to smart phones where new applications designed to offer ancillary services on mobile devices that allow the ability to post customer experience whether it is positive or negative, with the accessibility to add-on choices whether pre or post-trip regardless the time of requesting and their location. Deep understanding of the customer enhances airlines to analyze customer needs, behaviors, and decision-making processes along the entire travel experience and across all journey types. A personalized and tailored offer enabled airlines to enhance their pricing strategies, customer service and loyalty programs, to guarantee the efficiency of the operating processes and the implementation that will increase revenue and generate more profit opportunities. Ideally, airlines would prefer the direct distribution for cost reduction, but in fact this reduces their worldwide deployment, revenue and profit generation.

Meantime, the best way that airlines deploy merchandizing concept is displaying their products; the inventory, pricing, ancillary services through Global Distribution Systems GDS, travel agents, internet booking engines, Interline sales and 3rd party affiliate schemes (code share) which is not an easy process, it needs a strong, flexible airline reservation system that is connected to these systems using IATA messaging standards and interfaces (www.videcom.com, 2017; lek.com, 2017).

1.1 Global Distribution Systems Capabilities and Messaging Construction Standards

The fundamental traditional sales channel for airlines and the single point of access for airline to distribute their products: seat availability, inventory and fares is the global distribution system, it's a worldwide computerized network used also to display and distribute hotel rooms, rental cars, and other travel related items through travel agents and online travel sites. GDSs expand their role by hosting the airlines Passenger Service systems PSSs in addition to the mediator or distributor role. Nowadays, the main concern for airlines is the development of GDSs, so they can accommodate the speedy introduction of ancillary products and services according to the customer personalized data within the tremendous increase in fees, and due to GDSs limited capabilities to interact and involve customers to excel their shopping behavior through personalized offers based on individual customer experience. Moreover, they do not hold any vendor inventory they are just real-time linked to the vendors' reservation systems and database (Jainchill, 2012; Pease, 2007; airlineworld.wordpress.com, 2017).

Airlines' messages is transmitted through standardized messaging system, they are known as Type A Electronic Data Interchange for Administration, Commerce, and Transport (EDIFACT), and it's been referred to by Type A. Real time interaction communications is the functioning of this messaging type and Type B Teletype messages (TTY) is for informational and booking type of messages. EDIFACT provides a set of syntax rules to structure, data elements, segments and codes. It is a formal communicating protocol to exchange electronic business documents that is in readable language for machine descriptions, besides the major electronic benefits of cost reduction and increasing the processing speed. Currently, GDSs pass the availability status from airlines through Availability status (AVS) messages after the combination of fare field with the specific Reservation Booking Designator RBD on each flight at real time to travel agents using the structured data format EDIFACT. (Tanija, 2017; www.edibasics.com, 2017; gdsreservationformat.weebly.co, 2017).

Preceding the electronic mails by several decades, Type B TTY messaging was widely used in exchange business documents. It is restricted to a maximum range of message length of 60 lines up to 63 characters with certain limitations to abbreviations and signs that are charged individually. It is characterized by the "store-and-forward" mechanism; messages can be stored to later time and re-send in case a failure of being received. Type B users have to be well trained to understand them (Holcomb, 1999; Chan, 2002).

In 1990, by the emergence of internet the word has changed in methods of communication in general. Air transport industry in specific and the data transmission format of open networks were highly responded to the market pressure. The major providers of transport communications and systems engineering solutions for data transmission's formats and communication networking kept working on the development of Extensible Markup Language XML-based version that is known as Type X. This new application involves greater functionality and advanced capabilities replicate many features and functions than Type B, it will enhance the communication solutions to another level and forced the aviation industry to step forward. One of Type X features is supporting the use over Internet protocol IP networks and web services communications protocol. It was designed to set some rules for encoding documents in a certain format which is readable by humans and machines as well, also it reduces costs by enabling industry suppliers and consumers to exchange data with high level of quality easier and faster than before. Around a decade, the XML standards have been used in transport and travel industry. Meanwhile, the XML-data base is considered to be the fundamental platform for standardization of secured and fast big data transmission. Type A and Type B data transmission formats of messaging are limited in its functionality, features and costly. Accordingly, there was a need to evolve innovative messaging format to match the new capabilities of data transmission which is X type (ARINC and SITA, 2006; Hanke, 2016). The Development of GDSs capabilities introduce "Off the shelf product" these products are available and suits for any situation to anonymous customers without any customization or personalization. Nowadays, GDSs are widely used for booking hotels, railway, car rental and other related travel field. They construct ready-made itineraries that commonly requested by most of customers with the support of applications and new technologies in gathering customers' data they design and deployed especially for travel agents to store the obtained frequent flyers' data and save it to be used in later bookings.

The online sales strategy was improved by the integration of GDSs with hotels, airlines and car rental. This comprehensive collaboration enhances the travel business and widens the distribution capabilities and providers utilization. Adapting the concept of Off-the-Shelf by GDS provides the customer with a bundle or package of cohesive and associated products all in one sale. The exchanging messages between vendors are supported and processed by applications through GDSs which are structured to be easily integration through encode/decode internally (www.experienceengine.com, 2017; Hanke, 2016).

1.2 Interlining and Inventory distribution

In aviation industry interlining is referred to as a voluntary commercial settlement or agreement between individual airlines, to handle travellers' itineraries to certain destinations that require more than one flight on multiple airlines. This agreement could be Bi-lateral Interline Traffic Agreement (BITA) between two parties or Multilateral Interline Traffic Agreement (MITA) more than one party in a way to facilitate, coordinate and preserve of their liabilities. The collaboration of exchanging documents varies and not limited to one type of agreement, it includes: Interlining bookings and electronic ticketing, baggage and cargo, Special Prorate Agreement (SPA) and frequent flyer program, Codeshare (free sale without seats limitation or block seats whether soft with seats release or hard blocking without releasing seats, Anti-trust immunity, Joint venture and franchising that also covers the fares). This type of agreement can be done between airlines that are members of same alliance or non-alliance in the perspective of one airline that cannot compete on same routes; on the contrary they promote and extend their own networks in which payment settlement can be done through IATA Clearing House or, "Guaranteed Sell," Payments has been done by travel agents can be collected through IATA billing and settlement plan BSP (www.iata.org, 2017; Gleich, 2010; avconet, 2007).

Airlines reflect real time schedules of their inventory to interline partners used to be through IATA protocols; the Standard Schedule Message (SSM) or Standard schedule Information Messages (SSIM) messages. They are fed and provided to be deployed on GDSs and the Availability Status AVS messages are usually sent to update inventory levels in an exchange transmission within other systems database via Type A messaging to ensure accurate availability displayed. In addition to that, there are codeshare agreements that offer standard elements concerning the space sharing agreements of the seats, the operating airline inventory on joint services between partnered airlines. It allows them both the capability of jointly price and distribute, in which partners promote their products mutually and avoid competing against each other (Wald, 2017; Holloway, 2008; Gleave and Others, 2007).

Blocking space and joint venture agreements allow airlines to share their inventory and revenue management systems separately. The joint service can be controlled by one carrier acting for both or by both. The main difference is that partners share the cost and revenue and should be protected by competition laws. Franchising is another type of inventory distribution capability, it is cost-effectively where the franchisor would expand their network and considered to be a channel of deployment with outsourcing capacity in targeted markets. Lufthansa is the best example of code sharing and joint venture agreements they have a successful joint venture with Singapore Airlines to share revenue on a set of flights on targeted routes. In some markets, General Sales Agent (GSA) is substituted by franchising through assigning a travel agent to act on-behalf of the airline (www.lufthansagroup.com, 2017; fay, 2010; Show, 2016; Odoni, 2016)

1.3 Indirect Interface

Travel agents are on the top of indirect interface and traditional distribution capabilities, the coordination of the billing and financial settlement to travel agents through billing and settlement plan (BSP) or Airline Reporting Cooperation (ARC). For those who are not IATA accredited, GDSs provided solutions to facilitate the direct cooperation between non-IATA travel agents and airlines. Direct Travel Agent Bookings, provides those agents the accessibility to deploy airline inventory and fares through a modular booking engine that is integrated with the airline system and have the ability to create real time bookings and issue tickets, with the specified forms of payment that have permitted by the airline. This capability can decrease the airlines' costly distribution fees of GDS system and other networks of distribution capabilities in a way to maximize revenue.

Due to the technological enhancements, they took new forms of cooperation through internet that increase the competition and force the traditional travel agents to enhance their strategies through the web services for better cooperation with airlines and to satisfy consumers by enabling them to online purchase tickets.

Travel management companies, online travel agent, corporate booking tools (TMC/OTA/Corp) are the best model and practice of distribution capability due to the fundamental privileges of using the internet such as cost reduction, the availability around the clock without locations barriers (www.travelpulse.com, 2017; arabianbusiness.com, 2017; Mills, 2017).

At present time they are facilitating airline bookings approximately by 55%, despite that, there are some limitations and restrictions for agents and corporations in deploying shopping through this capability that are expensive and challenging to develop. By time, they are getting more advantages in displaying all travel vendors' products. Till recent times, customer buys a ticket by the concept of one-size-fits-all the total fares are based on the basic ticket price and real time schedule regardless passenger's customizations. GDSs were pioneers in enhancing the capability to deliver airline content to a massive base of travel agents and/or consumers with a high level of technology, efficiency that led to introduce the assembly-line fashion of airline distribution, or "Push Model" that encompass a large amount of real time airline data such as fares, availability, and schedules. These solutions were designed especially to (TMC/OTA/Corp) through "EDIFACT" messaging format that is known as an "anonymous traveler" sale, as airlines were unable to determine the customer identity at the time they offer their product for sale (www.crankyflier.com 2013; openaxisgroup, 2017).

The assembly line model enables airline to offer individual travelers, travel agents or corporation's differentiated product or service offerings centered to "who's asking". Nowadays, the airline product becomes totally commoditized, having maximum benefit from the same modern airline connection capable of highly-flexible functionality of the markup extensible language XML messaging for its functionality; rapid and accurate information speed to market with rich and deep in content. Airlines are still having control over intermediaries that are unable to interface with airline customer relationship management system CRM, frequent flier programs (FFPs), merchandising and personalization systems. The Internet booking Engine (IBE) and meta-search engines enhances and facilitates distribution capabilities and the booking process of flights, hotels, holiday packages, insurance and other online services in different environments; Business-to-business (B2B) or Business-to-Customer (B2C) as it is designed in a way that can be integrated and interface with the existing system landscape of vendors in a friendly user manner offering a range of features, all based on latest technology. They are considered to be online travel are having the same payment and billing settlement with airlines. Although the great usage of IBEs, they cannot bypass the GDSs as a distribution capability because they are initially sustained by major GDSs; Amadeus, Sabre and Travelport. Expedia.com is the best practice and of an integrated and affiliated online travel agent with internet booking engine and meta search that is having all the features of them to get the maximum benefit penetration (www.files.shareholder.com, 2017; isogmbh.com, 2017; toptenreviews.com, 2017).

The digital revolution and screen scraping have reshaped the customer shopping behavior, and add a great value to the online distribution. There is a great shift and transformation from product-centric to a customer-centric model to comply customer preference, almost 59% of customers' purchases came after an online price comparison and then they share it with others through viral marketing. Travelers are convinced that there are always lowest rates or fares can be obtained, some IBEs advanced the features of their websites to cross-shop customers from site to site. Screen scraping technology widely used by meta-search engines, it is known as harvesting tools or web data extraction usually apply to get live availability and comparison of flights across multiple standalone search engines through hyperlinked airline websites, getting content and process the data then extract the requested data with Hypertext Markup Language (HTML) and transmit data to the browsing customers to achieve the optimum offers all in one screen and only by one click, Kayak.com and Orbitz.com are the best example for such technology. Customers are redirected to the airline.com to accomplish the purchase transaction. This type of IBEs is one of the best and effective online distribution capabilities that airlines highly depend on (Redden, 2015; Longlois, 2015).

In a new phenomenon in the online world, that relatively connected to flight searching and shopping is using a flight auction site, bargain sites or bidding sites. An auction site is mainly defined as a site in which auctions off the available promotions and offers to the highest price offered by any person under a certain commercial deal with the airline to sell and distribute their products. It is considered to be the latest fashion of distribution capabilities that increase airline after sale revenues. If the offered price is accepted as the best bargain then their bid will end up winning the flight.

However, there are downsides to the bidding process which is the un-specification of the customers' destination or the requested departure and arrival times most of the times it's uncontrollable as per the bid rules. Airlines collaboration with the auction sites illustrate the desire to increase revenue after sale to offset the offers they initially provided and usually used to promote the ancillary services that are usually disclosed to the flight provider before they actually commit. Despite the negative side of online shopping world, auction sites are measured as an excellent source of finding cheap flights with ancillary services for tightened budget. Priceline.com, Auctionair.com, Skyauction.com, Ebay (Vacation Packages) and luxurylinks.com are the famous ones in such distribution capability that enlarges its activities and presence all over the world and gain more trust worthy among both customers and airlines (www.cheapflightsfinder.com, 2017; Doganis, 2002).

2. Development of Information Technology Capabilities

The world technology has dramatically changed and advanced rapidly in a very short term in general. The travel industry was witnessing this development, as airlines are implementing all digital capabilities and trends to win customers to their side; this was obvious in offering an excellent flight experience for travelers across the globe. Recent studies estimate that by 2020, there will be 25 billion connected devices. Accordingly, airlines are getting more innovative in their selling propositions to be more effective in the way that fulfill customer preference, so that travelers can find the value they seek and airlines gain more profit. By 2021, studies reveal that airline distribution will grow and expand the idea of current technology-centric that could be in passive and rigid state to a more dynamic, flexible, and customer-centric environment that has been recently known as active Distribution. Airlines' direct and third-party retailer channels must improve their distribution methods. The Active Distribution requires different platform to be based on, or integrated and accommodating with multiple new technologies and consider the enhancement in smart-phones capabilities as one of the new distribution channels through interactive software's that airlines can highly depend on. The new technology of the artificial intelligence or virtual reality should be included as they will play a vital role in enabling the dynamic pricing and personalization concepts. All these practices will grow the travel business model to Business-to-Anyone (B2A) or Business-to-Everyone (B2E) besides B2B and B2C. (www.w3.accelya.com, 2017; iata.org, 2017; flightglobal.com, 2017; Tanija, 2011).

2.1. Airlines New Distribution Trends

Enhancing the core airlines business and distribution capabilities to make the core business more efficient, it needs to be exposed to new trends in technology. The Internet of Things (IoT) is the heart of the digital business. It creates a business advantage that it raises the connection of physical objects via a network to improve services in the sky. IoT has been used in airlines industry in many fields on operational level and on the merchandizing and distribution level. The increase in internet speed in many countries helped travelers to turn to the web for their travel journey planning, booking and self-servicing flight purchasing details. This provides airlines the opportunity to widely spread their products digitally, which will enhance the dependence on Technology Service Providers (TSP) too. Delta Airlines, is one of the first airlines that is using Radio Frequency Identification (RFID) luggage tracking technology to provide real-time baggage status in a way to avoid the baggage lost. Another trend is the Virtual Reality (VR) that demonstrates an artificial environment twisted through software and presented to customers and accepted as a real environment. It experiences two of the five senses: sight and sound. Recently, VR is not just a way to elevate customer traveling experience and add a lot of fun; it is a way for airlines to collect data on customers. Qantas airlines is a pioneer in applying VR in the world of aviation, they have partnered with Samsung to provide devices to passengers onboard so they can be entirely deep in games, Hollywood movies, and more to entertain and kill the time of the flight. Virtual reality is also used to promote destinations. In later enhancements, airlines will use VR to preview the insight of aircraft and its amenities at the purchase time, in other way it can enhance airlines retailing concepts and merchandising capabilities (www.qantasnewsroom.com.au/2015; Prasad, 2018).

Big data is a new terminology that best illustrates the large volume of data structured and/or unstructured used in huge amounts in day-to-day business. It's not the amount of data but how important in order to be processed for insights and analyzed to lead to better decisions and strategic business moves. Recently, Aviation field got the maximum benefit from using it, as it permits airlines to enter a new era of data-based commerce and form various initiatives on the operational and commercial distribution capabilities level. Airlines can put in action the customer gathered information and process it individually by sending actual tailored real-time offer on customers' data base, actions, purchase history, search tendencies, preferences and more.

In 2017, United Airlines has executed the innovative data-focused mantra: "Collect, detect, act." Its objective was concerned about the preference of perceiving the individual customer to their service and product; this is very difficult as it requires continuous analysis of customer data at every point of contact. This will develop the customer relation management (CRM) system and its ability to store and retrieve this type of big data. Automation in airline industry is not of the new technology trends, it was exclusively been used by air lines. Nowadays, it has a huge development through passenger self-processing; online bookings and tickets self-issuance, check-in and self-baggage drop offs besides, purchasing ancillary services and in-flight services. Recent tensions and terrorism incidents pushed airport authorities to prioritize speed of airport security checks and safety and took the highest concern. The devices' technological compatibility allows airlines to state the identification and integration of any digital solution with reference to the travel itinerary and provides the chance to optimize travel services in general (Graham, 2008; Tanija, 2011; w3.accelera.com, 2017; Kalický, 2013).

Artificial Intelligence (AI) is the theory and development of software that is capable to execute tasks normally requiring human intelligence behavior like robots, it has many forms like; speech recognition, visual perception, language translator and decision-making. It is recently used and cemented its presence in the airline distribution sector. This technology helps airlines to integrate the gathered big data, and focusing on predictive capability to provide good service to match consumer demand and really speaks to travelers, reads passports for passengers. UK-based easyJet has been using Artificial Intelligence for a few years; it is a vital part of its revenue management strategy and will be applied in catering and flight scheduling. Artificial Intelligence and big data help to enhance airlines ancillary in-flight services. In 2007, the top ancillary earner of (miles purchases, baggage fees, seat upgrades, in-flight entertainment, and food and beverages) accounted for 16.2% of total airline revenue. Nowadays, it reaches 38.4% which is more than the double. Using AI allows airlines to predict anything about their customers; they can tailor in-flight promotions to specific needs and can be linked the customers' social networks in a way to impress them. The application of these new trends and capabilities guarantee an appropriate positioning for airlines in order to be proactive to the market demand (Tanija, 2017; Harteveldt, 2016).

The Latest technological trend that introduced lately as a smart application known as 'Chatbot', it's an automatic chatting engine for messaging, this technology squeezed some of the costs and develop customer interactions, and it also faced some challenges as any new smart application in its primary stages whether to be accepted or not. Nowadays, in aviation industry is been frequently used through Facebook messenger. Studies reveal that six out of 10 most-downloaded smartphone apps are for messaging. So it will observe a great progress in the coming period. Chatting is universal, Ninety-nine percent of people understand, send and receive messages using normal words or symbols like "emojis" on their mobile devices. Messaging and chats are rising significantly. Airlines must have a great advantage of spreading the use of this application; they can send their customers' regular updates about their flight via chat apps and deploy a link for online check-in and generate a boarding pass. Chatbot is the best to prompt ancillaries' for example; reminding passengers with services they did not buy yet. chatbot is not only used for retailing airlines products but also can be used for an open discussion with their passengers for more customer rapport and engagement. Moreover, airlines should work on changing customer perspective and add chatting technologies to the normal channels for easy, fast and better communication with customers. In all-purposes automation has allowed businesses across travel industry the opportunity to optimize services (Hoover, 2017; Kothari, 2017).

2.2. Retailing, Personalization and Dynamic Pricing

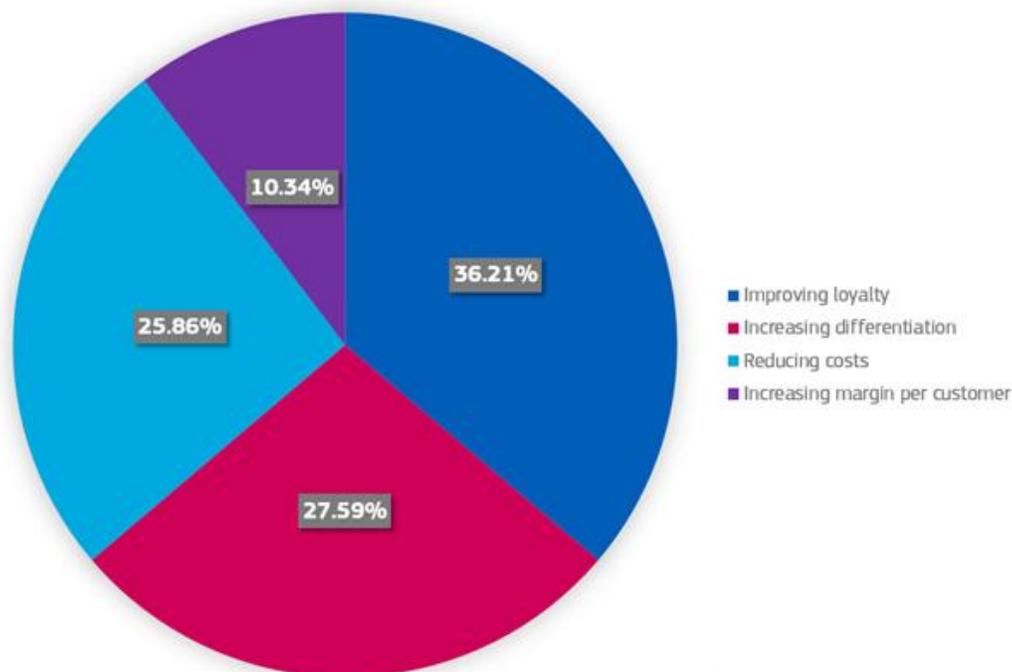
Airlines lately enhance their investments in new internal selling systems to add the flexibility to their PSSs in a way to adjust the full retailing platforms that are no longer adequate for dynamic sales environments that evolves. Technology enhancements and marketing intelligence enable new opportunities improve retail business in air travel. Airlines are on the right way to be better retailers but still controlled by their traditional selling propositions. New customers that are called "Generation-C" content-centric, connected and always clicking with extensive knowledge and awareness that facilitated by digital applications can be motivated with smart entertaining opportunities throughout their journey, in which they are suffering limited services' capabilities they receive unlike airport retailers they are excelling in inexpensive logistics to grab more Generation-Cs. The retail business model for air travel needs to be fully integrated and combined between airlines and airport technology to comply customer needs.

Airlines ancillary sales are growing every year and still generate revenue through multiple travel-related products whether airlines products such as; baggage allowance, ..etc or the commission-based sales of third-party products and services that are done through airlines' websites of hotels, car rentals and insurance. The new concept of distributing capabilities move towards the bundled price products through digital multi-channel retailing products and services that require efficient retailing techniques that will shift airlines focus from just optimizing flight revenues to optimizing total customer value (Piller, 2010; Christ, 2009; Cronrath, 2017).

A fundamental shift towards personalized connectivity of airlines is now considered a must, Airlines have to offer customer the same level of service throughout their journey or airlines will have the risk of losing out their customers. Amazon.com becomes the top online retail with giant personalization capabilities enable their customers to find and select the desired product in a quickly, easy and reliable shopping experience in a smooth and pleasant one. In the digital age, the advent of mobile devices empowered consumers' personalized travel experience just in a few clicks. Personalization is to run-through customers' big data usage to understand, assess and predict customer behavior to deliver a satisfactory product that is perfectly aligned with customer preferences and insight. Unlike customization, it is done by users themselves according to his/her preference and receives information and/or product that best matches those interests. The Power of personalization remains in adopting a customer-centric approach yields which grant better results and builds greater brand loyalty that certainly will drive more customer engagement, loyalty, positive reviews, good word-of-mouth recommendations and customer retention which will differentiate those airlines among rivals. It also helps to shift customer priority from price to real value when they book their trips (www.cognizant.com, 2015; sabre.com, 2017).

Dynamic pricing system changes the concept of pricing products that is now depending on a customer's profile data stored at airlines customers purchasing pattern and demand that helps offering cheaper prices during off-peak. The capability of analyzing big data leads to dynamic pricing and allows airlines to predict with a high degree of certainty customer demand and preferences. Airlines can integrate this tailored pricing with marketing and promotion activities in real time to optimize bidding. Dynamic pricing could usher in a new era of fine-tuned channel distribution strategies. Harmonized loyalty programs differentiating airlines in the market place, the best practice is Lufthansa miles and more. The loyalty programs is considered to be the ultimate source of collecting a wide range of customer data; it allows airlines to build personalized offers, tailored marketing campaigns and drives more sale of ancillary products and services. The increasing pressure of operating costs in the travel industry, fierce competition, customer price sensitivity and challenges in reaching new customers; obliged airlines to search for new ways to differentiate their products in order to gain incremental revenue, improve yield and provide more value to consumers. (www.mycustomer.com, 2017).

Merchandising ancillary products is the effective strategy to face the current challenges. The major trends in merchandising and dynamic pricing have emerged to enhance customers' shopping experience; the flexibility and price control provided to travelers for choosing products and services fares are considered to be its main features are the that best meet customer needs. First, Bundling ticket prices it is a collective ancillary products and services with categorized fares families, ranging from low fares with no additional services to premium fares with the greatest level of service and benefits. Second, Unbundled pricing; it is the pricing of ancillary products and services that are excluded from the total ticket price but are offered as "à la carte" options added to the basic ticket fare. The third trend is the Hybrid Pricing, this trend is considered to be a mix or combination of bundled and unbundled ancillary products and services, hybrid pricing provides optimal flexibility and increase revenue potential with maximum cross sell and enhance selling opportunities (www.sabreairlinesolutions.com, 2017; Tanija, 2014).



Source: www.amadeusblog.com, 2015

Figure 1: Benefit of Personalization in Travel Industry

Figure no.1, shows the benefit of personalization in travel industry, it reproduces the direct impact of personalization on airlines performance. Customer loyalty enhanced by 36.21 % which is the biggest percent among the elements as passengers found what they want without a lot of explanation or searching. After improving loyalty, the differentiation rate increased by 27.59% as customers' desires and needs are now familiar for the airline so it will be their first choice when planning a new trip. Reducing costs is not the biggest benefit of personalization in the travel industry, definitely it is very important but introducing the right offer or service needed by customer in the right time would undoubtedly help better than using the advertising budgets that will in return lower the cost in the long run. It is surprisingly to find that the increasing marginal profit per customer considered to be the least significant benefit of personalization in the travel industry by 10.34% as personalization that does not have a direct effect on airlines' revenue, yet it can increase basket size of displaying that will contribute in generating revenue then profit.

Nowadays in travel market, customers' decision to book with one particular provider has been based on 3 key factors: First, Website functionality and its accessibility and friendly usage. Second, is the availability of selected package. The last key factor is the price. This means that the ability of supplier systems to respond accurately and quickly to search requests is critical in getting the deals. Most of online travel websites use the latest "filter techniques" across a number of supplier feeds in real-time. Every partner in the supply chain needs to implement and manage the effective connections that is affordable and best encounterbusiness demands (www.wns.com, 2017; triometric.net, 2016).

3. IATA-NDC Launching, Vision and objectives

The indirect distribution channels have limited access to the type of rich content and ancillary services presented to customers than airlines' website. It takes much longer to deliver new airline products such as; preferred seating and lounge passes through the indirect channels. Differentiation and personalization of offers is limited only to airlines according to the current distribution channel architecture. The New Distribution Capability (NDC) is a travel industry-supported program designed and launched by IATA for the enhancement of market adoption to a new, XML-based data transmission standard in according to the resolution 787 in early 2012. IATA usually set standards and procedures and provides airlines many solutions to simplify the business and better manage the distribution of their range of products and services. Due to the excessive need of customers to more real time dynamic interaction through all travel parties: airlines, distributors and travel agents, travel suppliers are able to offer an intelligent response for all products based on customer personalization and preferences.

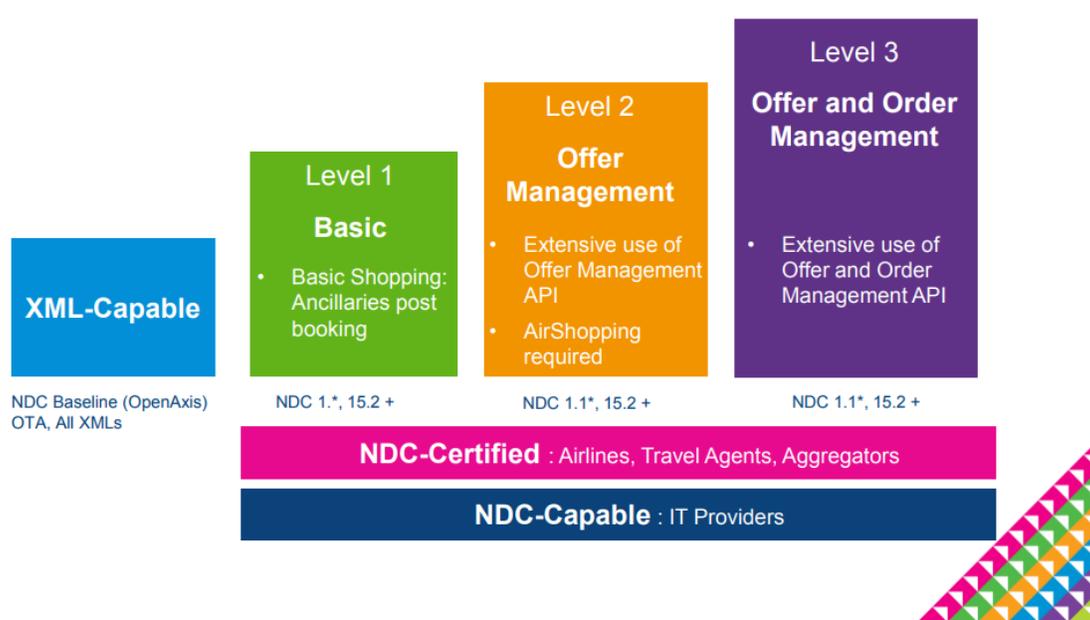
This process should be well controlled, monitored and managed to oversee the development of new passenger distribution platform and standards. NDC slogan is "Together Let's Build Airline Retailing" this slogan is measured to be IATA-NDC vision as it will enhance and develop the capability of airlines in retailing to change their business perspective and increase ancillary sales too. This can be done through enabling airlines to become merchandisers, not just people transporters in terms of profitability. NDC facilitates the communications between airlines and travel agents and enhances airlines technical capability to develop their distribution methods and adapting the retailing concept that will assist airlines' commercial decisions too by addressing the industry's current distribution access to full and rich air content and transparent shopping experience (www.iata.org, 2017).

The primary objective of NDC will allow airlines to make sales offers created directly to travel agents without being prepared and constructed through intermediaries as GDSs, in a way or another it will reduce their importance to airlines and travel agents and they will not rule the game anymore. Accordingly, GDSs have to enhance their capabilities to match the new distribution business model. The NDC sales offers are real-time and eligible to rich content; this can easily allow dynamic and personalized offers. It also facilitates different opportunities for the airline to manage other components throughout the indirect distribution process. The NDC Standard will livelihood the entire airline distribution value chain, the stakeholders are; the airlines, third party technology companies e.g; passenger service system PSS, filing agencies like ATPCO..etc, travel agents, resellers including meta-search engines, Travel management companies, online- travel agents and corporate booking tools (TMC/OTAs/Corp). GDSs started to shift their business model to suit the application of NDC and to act as aggregators. In terms of benefits, NDC standardis having the powerful tools to simplify the distribution process with innovative technology, interoperability and cost efficiencies as it facilitates and gives the accessibility to new capabilities to all players in the distribution value chain (Hoyle, 2015; Hanke, 2016).

3.1 NDC Schemas and Certification

New Distribution Capability NDC Schemas are the outline or border of a new model set by IATA for airlines to deploy their products in the market to respond proficient, quicker in better communication field with travel agents or directly with customers through their websites. These schemas allow airlines end-to-end distribution process to deliver improved customer experiences. Airlines are not obliged to apply NDC; it is flexible and business model-agnostic. Though, the great shift to personalization and big data concept, airlines may find themselves at a certain level forced to apply NDC or will be out of distribution markets. The shopping schemas provide airlines to deploy their services and offers using their rich content in a personalized form as per customer profile. The Order management schemas allow airlines to manage NDC-driven orders over its stages starting from booking to service fulfillment through aggregators. Offerings an alternate form of payment and ticketing methods are a great advantages of NDC as it diminishes the need for Agent Debit Memos (ADMs). Further schemas like; Interlining schemas its objective is to facilitate airlines manage and exchanging NDC Shopping and order Managements and associated services and ancillary products between interline partners (Hoyle, 2015; iata.org/ndc-resolution-787, 2017).

Today's EDIFACT messaging system is opposing airlines' merchandising and personalization through the use of GDS as it delivers the information in a static display with limitation to its product when displayed through travel agents. Airlines are eager to perform e-tailing practices and are willing to shift the selling concepts to be more dynamic, as retailing, unbundling, a la carte pricing, and merchandising to separate elements that used to be part of the fare. Airlines want to deploy their products in a flexible and powerful way, more widely with rich content and services' details. NDC is ready to extend this flexibility across the airline distribution value chain through the standard XML schema. It is an open data standard to establish the parameters for transmitting data between partners to embrace e-retailing. XML Application Programming's Interface APIs have been heavily used through online travel agents for sharing data among various systems, XML is considered to be the enabler for seamless connectivity and syncing between different systems in real-time that is identified as 'the information exchange standard' between different channels. IATA supported the integral of XML-data base with NDC to standardize and simplify the business without requiring great programming knowledge. Adopting NDC based on XML allow airlines to decrease GDSs dependence and regain the offers ownership. (www.triometric.net, 2017; consortiuminfo.org, 2017). The main objective of the NDC Certification Program is to approve the level of a particular airlines, travel agents, IT- provider or aggregator capability to send and receive NDC messages through NDC Applications Programming Interface API or any agent or aggregator that consumes/use these APIs. They can put on any of the available versions of the NDC schemas. There are three levels of certification and types.



Source: www.iata.org/standard-presentation-ndc-certification,2017

Figure 2: NDC Certification Scope & Levels

Figure no. 2, shows the IATA classification into three Levels, the NDC-Certified Applicants are; the airlines, travel agents and aggregators while the NDC-Capable is the IT providers. XML-capable is the NDC-baseline in which they have the technical capability to using the OpenAxis technology like online travel agents OTAs and all XMLs booking engines and meta-search. It also shows the three types of deploying airlines data. Level one; contains the basic shopping and ancillaries where airlines can display their product and additional services and future bookings. Level two; contains airlines that can create and display their full product content through offer management. It is the airline creation of extensive display and distribution of full product offers and to sell their baggage, seat choices and ancillary services, using rich content in a customized and personalized manner without any using the NDC-API and return it back to the travel agent including the dynamic pricing. Level three; contains airlines that are able to display their full products and services content through offer and order management. It is considered to be the advanced stage of gathering the features of level 1 and 2 where airlines can create, store and manage the full product offers and orders of their products and services to sell it bundled or unbundled with other additional services and ancillaries using rich content, also in a personalized or anonymous besides the payment and financial control and issuing the tickets using the NDC-API and managing these offers throughout the entire lifecycle.

Airlines are having the opportunity to exploit the full benefit from the NDC standard, the end-to-end process begins with the offer when it is created by the airline host. Going further than distribution opportunities, NDC can be seen as an innovative move for offer creation with the advantage of personalization and dynamic pricing. This enhancement should include the process of data flow, payments and billing system with a new relationship with BSP, in addition to the developments in revenue accounting systems. All parties are in need to certain preparations and readiness for get the maximum benefits of the new distribution standard, the airline's internal system architecture needs to be extended, renovated, integrated and updated such as the PSSs and other related systems of loyalty and customer relationship management. After adapting NDC-API-XML the exchange data through the integrated layer between existing systems and distribution channels will be more efficient and controlled and facilitate the connection through the aggregator and also with the NDC-interline partners.

Third parties as well need to cope their capabilities with the great development in airlines distribution world (www.eyefortravel.com, 2017; Holyes, 2015; prologis.aero, 2017). The NDC - Pilot phase started in 2013, it was considered the first step on the roadmap towards industry adoption, and it was the reality of the great invention in airline distribution. This phase includes airlines that are in test mode or full scale live implementation and prepared to adopt and apply the NDC-schemas. By time more stakeholders are setting up NDC - Pilot and Deployment project, over 20 airlines with an impressive adoption rates in 2017 with variation in level of certification.

The IATA is getting enthusiastic when big players started to step in the new distribution capability that encourages other players in the industry to dig in with no fear. (Courtas,2018; Hanke,2016).

4. Power of Standardization

Standardization is the one of business competence elements and simplifying the business using new technologies considered to be the main objectives of IATA when adapting NDC program. The Technical standards simplify things and enable efficiencies, innovation and reduce costs by making all the industry parties speak the same language. Today, the development in messaging standard between an airline and distribution systems through XML-data base technology helps airlines better interact and display their product offerings in more advanced and detailed manor. NDC messaging standards will support the airline in communicating and displaying its offers directly to all of the distribution partners, which can implement the new communication protocol XML-data base with the airline reservation system. In that perspective, airlines can distribute their products through travel agents in the same way they offered them over their websites, with a competitive edge rather than their competitors. In other words, NDC standardization will increase the efficiency and transparency of real-time schedules regardless the distribution channel (www.travelcommercesolutions.com,2017).

5. Findings , Conclusion and Recommendation

The development of airline distribution capacities through the past 3 decades and the innovative methods in application and the benefit from the nonstop development in information technology can be an effective tool to achieve several goals. This includes the new technological and distribution trends with the professional techniques used, that can make the difference of implementing the airlines' distribution strategies. Airlines' enhancements of their PSS systems considered to be the beginning phase of the development of distribution that will contribute on airlines sales and revenue. GDSs have to change their strategies and change their business model to cope with the tremendous transformation in airlines distribution capabilities that they were exclusively dominating for a long time. Merging the technology and data transmission trends with the distribution methods, will always result innovation depending on the way of application. Online distribution is not a new trend anymore; the matter is how innovative the distribution method is and how well it allocates high technology i.e. Artificial intelligence, chat boot, ,..etc. After the entrance of new players like aggregators, GDSs will be in risk of losing a lot of business, besides the change in customer preference and awareness. Airlines are recommended to cope with the IATA initiative of adapting and deploying the new distribution standard and the integral with XML-data base to get the maximum benefit from: Common standards shared between partners, through using the high technology in data transmission through APIs across partners, that will lead to further reduction in distribution costs in a transparent way of selling products across all channels in a personalized conditions that fits for all customer preferences.

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