Information Systems at the Airport

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ABSTRACT

Air traffic is a dynamic activity which trends partly depend on the general economy of the society. A phenomenon that is being researched as part of master's thesis are information systems. The research problem (which is always wider than the object of research) are information systems in business in general, while the subject of research are information systems at airports in Sarajevo and Mostar.

The established subject of research involves the processing of information systems, with a particular aspect of information systems at the airport. The research results will show the development of information systems at the airport in Sarajevo and Mostar. The research results will also show how the information systems at the airport in Sarajevo and Mostar are aligned with modern technology development.

Keywords: RAD, information system, EDS, information technology

1. Introduction

The organizational structure of the traditional airline has for decades been functional. The functional model will continue to be a good solution for those airlines that for most functions use outsourcing (catering, maintenance, etc.). Generally they do not use modern information systems, they provide a limited number of customer service and so on. Usually these are minor or so called low cost airline. The impact of information technology, the focus on passengers, increased competition, require more flexible business processes, faster response to requests from passengers, service differentiation over the competition, faster business decisions at all levels of management and so on. In order to meet these changes, airlines are adopting new organizational models in which there are separate business units that have more authority in decision-making and responsibility for their own profitability, but with a strong link between them.

2. Information Technology and Information Systems

The information system in the simplest way could be defined as a system that handles information in order to meet the information needs of the organization. By similar reasoning we get one of the classic definition of an information system: „The information system is a set of interrelated components that work together on collecting, processing, storing and distributing information to support decision making and control in an organization".

Although today's computer-based information systems is almost the rule, we must understand that the information system is not necessarily computerized. Organizations have a need and ways to handle information and before they invented machines to automate the processing of data and information. And today, the term information system almost automatically is associated with computers and other (mostly electronic) machines for the processing and transmission of data. However, we will not and may not equate information systems of organization and information technology on which it is based largely.

Information system is a socio-technical system consisting of mutually coupled technological and sociological components that serve a common purpose. This setting is very important. It essentially determines the approach which should be in the areas and the development and use of information systems. People who use an information system called are called users: users of IS are individuals or groups who have the task of providing input or receiving output from the information system (Laudon and Laudon, 1984).

Generally speaking, the three activities of the IS organization is to produce the information needed for decision making, control activities, analyze problems and create new products and services. These activities are: input, processing and output.Input collects raw data from inside the organization or environment. Processing converts the raw inputs into form with meaning. Output data is presented and thus transmit certain information to users of the information system.Information systems also require feedback, output that returns the appropriate members of the organization to help them evaluate or correct certain phase inputs. Computer-based information systems rely on computer hardware, software and technology for the processing and dissemination of information.Computer programs or software are sets of operational instructions that direct and control the computer processing. Knowledge of computers and computer programs is important in designing solutions to organizational problems, but computers are only one part of the IS.

2.1. The development of information systems

Standardization of models on which to build an information system is an important issue. Use of standardized development methods, techniques and tools is introduced in the development process, structuring it and thus makes it more susceptible to control and more efficient. But standardization on the other hand can produce too "harsh" understanding of the methodology by which the parts of the system being developed. Structured, traditional methods and models for the development of information systems often suffer from these ills. This is one of the important issues for managers who lead the development process. To find the answer to it, successful managers are finding a good balance between these two extremes. In connection with the use of traditional, structured methods of information system development, there are several essential problems, of which the most important are poor treatment of uncertainty and complexity. Although it is only in the last ten years it felt an urgent need for change in this field, the awareness of the existence of these problems existed since the seventies of the 20th century. Just because a long time ago there are approaches that are different from traditional structured approach.

These are serious attempts to resolve the evident problems of a structured approach. In addition to various audits waterfall development model, appeared in various more or less serious and comprehensive approaches, among which are the following: prototyping, iterative development, RAD (Rapid Application Development). In addition, it is possible to identify many more or less different approaches. All alternative approaches are, more or less, focused on improving the development process in terms of getting a better final product and optimize the effort and cost invested in development.

2.2. Electronic air traffic

Air traffic is a dynamic activity which trends partly depend on the general economy of the society. The impact of information technology, the focus on passengers, increased competition, require more flexible business processes, faster response to requests from passengers, service differentiation over the competition, faster business decisions at all levels of management and so on. In order to meet these changes, airlines are adopting new organizational models in which there are separate business units that have more authority in decision-making and responsibility for their own profitability, but with a strong link between them.

2.3. The organizational structure and business processes in air traffic

The organizational structure of the traditional airline has for decades been functional. The functional model will continue to be a good solution for those airlines that for most functions use outsourcing (catering, maintenance, etc.). Generally they do not use modern information systems, they provide a limited number of customer service and so on. Usually these are minor or so called low cost airline.

The main sectors in air traffic are airports, air Freight, airlines, air traffic control, Aerospace, travel and distribution, ground operations and department of government regulations in air traffic. Airports are faced with the problems of managing large numbers of passengers, cargo and plane. Some of the business processes within this sectors are:

- Management operations at the airport (Airport Operations) - includes information flight, integrated data management, management planning, resources and others.
- Operation luggage (Baggage Operations) - includes check-in baggage handling, sorting, tracking, control, baggage and others.
- Operation of passengers (Passenger Operations) - includes check-in loading, scanning and checking passengers and others.

- Transportation Security (Transportation Security) - scanning of passengers, baggage.
- Communication and Infrastructure (Communication & Infrastructure) – includes infrastructure management, mobile communications, messaging, hybrid networks and others.

2.4. The role of information technology in the evolution of business strategies in air traffic

One of the first investors in information technology was American Airlines, which in 1962 introduced the SABRE computer reservation system.

Computer reservation system (CRS) is a computerized system used for the collection, storage and processing of information, as well as management of transactions related to travel. CRS systems are controlled by by individual airlines, where agents accessing a single CRS system and make reservations for tickets. Online CRS systems are systems where clients themselves, via the web, access CRS system for searching services and the booking. The aim of the development of CRS system is to connect with travel agencies that represent MPs traditional airlines. In the mid 80s, CRS develops in comprehensive global distribution system (Global Distribution Systems, GDS), which offers a wide range of tourism products and services (transparency of air lines, reservation of accommodation, renting the car, etc.) and provides mechanisms for communication between airlines and travel agencies. Global Distribution Systems (GDS) in specific types of information system for distribution of tourism products.

The global distribution system (Global Distribution System GDS) integrates all tourist services, linking service providers and end users, providing information from all segments of travel, provides booking and sale of required services and thus provides value-added services. GDS provides services to clients at departure and the respective destinations.

2.5. Technological solutions for air traffic

Information systems for air traffic can generally be classified into four groups:

- Airline Management Solutions – includes solutions that help in the planning and control of resources such as airplanes, crew and others.
- Passenger Airline Solutions – includes processes sales of electronic tickets, check-in, etc.
- Airline Operations Solutions – includes operations pertaining to all aspects of flight planning, operations and others.
- Supplementary Airline Solutions - includes solutions for maintenance and repair of aircraft, cargo and others.

Key issues facing the air transportation are optimization, cost savings, improvement of existing capacity, faster response to changes and others. Some of the solutions that help airlines in achieving these goals are management systems crew and operations control systems for planning and scheduling, management systems revenue, marketing solutions and others. The planning process needs to optimize performance taking into account both technical and operational characteristics of the equipment, availability of human resources, government regulations and operational constraints such as rules air traffic control and others.

3. Information Systems at Airports in Sarajevo and Mostar

3.1. Sectors

3.1.1. Sector for Air Traffic Operations and Aviation Services

A very important link in the organization diagram of any Airport, including the Sarajevo and Mostar International Airport, is the Sector of Traffic Operations and Aviation Services. The complete structural organization of the service sector represents the symbiosis of sectors within it, whereas the formulation of "Team Work" gets into its full meaning.

The Air Traffic Sector at Sarajevo and Mostar International Airport consists of the following services: (1) Department for Operational Activities, (2) Department for Passenger Ground Handling, (3) Ramp Handling Service,(4) Center for Training of Professional Staff, (5) The Winter Service Department.

3.1.2. Department for Passenger Ground Handling

This service has several Units. A part of the service that performs registration of passengers is responsible for checking identity documents and documents for each flight passenger who intends to travel, as well as to register the

tickets and baggage to the final destination of travel. The staff in this service is trained to operate the system EDS (Automatic Passengers Registration, Instructions for loading the Aircraft).At the information desk, the traveller can get accurate information about the landing, takeoff, delays, information about the cancellation of flights, and all the information related to travel and the necessary instructions about other available services. The Personnel responsible for performing the processing of passengers are tasked to carry out the transfer of passengers from the building to the Aircraft and vice versa. This part of the work is currently being done by two Air Bridges in the most modern way and bus transfer if Aircrafts are parked on open positions. It is important to mention the assistance provided to poor mobile or immobile passengers, mothers with children, children travelling alone, as well as all other special categories of passengers.

High officials from the public and political life are offered to enjoy the discretion of the VIP lounge. A stylish lounge serves to welcome and farewell high officials, but it is also suitable for organization of business meetings and press conferences. Within the Department of lost and found baggage the search for lost luggage and its storage is carried out including its delivery to the passenger who reported lost or missing luggage. The Department of lost and found baggage, employees professionally trained and friendly staff who operate at a highly sophisticated computer systems fortracing lost luggage (WORLD TRACER).

3.1.3. The Sector for the Airport Development

ln the Organizational Scheme of the Airport this Sector has been existing since 2005. in the previous period, from August 1994 until 1996 under the Public Enterprise Airports of B&H the tasks of rebuilding and reconstruction were led by the Deputy Director of Reconstruction, who also prepared the projects and renovation plans.In the initial phase of works on the reconstruction of the Airport, staff was formed into a Team to implement the project. The PIU team (Project Implementation Unit), as it was called, had the task to monitor the stages of individual projects, to monitor daily dynamics and quality of work, to develop undefined situations by the project, procure Airport equipment and organize training for the use of high-quality equipment.

The reconstruction of the technical facilities and Passenger Terminal has been successfully implemented and today the Airport has the most beautiful Airport Passenger Terminal in the region, equipped with modern systems and devices. In the period from 1997 to 2001 the reconstruction of the Headquarter buildings finished as well. The necessary equipment was purchased and installed according to the dynamic which was conditional in order to gain funding.As a logical resposne to all ongoing activities carried out during the reconstruction of the Airport, the Development Sector was formed.The constant development of Air Transport requires adequate responses of the Airport. The Development Sector monitors all developments in terms of new technologies, standards, regulations, requirements of Airlines, passengers. Experienced and professional staff employed in the Sector is able to independently produce and design solutions, technical specifications, project tasks, long-term spatial planning documents, investment programs, annual investment plans and to supervise the execution of works.

3.1.4. Sector for Information and Communication Technologies

Aware of the fact that the information and communication technologies (ICT) are an important activity of each company in contemporary world, the Sarajevo and Mostar International Airport, in 1999, established a new Sector with the task of planning, development and maintenance of Airports ICT Systems. Today it is unthinkable that an authorized person in an extremely short period of time manually processes, prepares, and presents large volumes of data in demanding jobs, such as registering passenger/baggage, cargo, mail, balancing the weight of the Aircraft, generating reports, and creating a packet of information for travellers, Airlines, agencies and other participants in Airline Traffic.The Sarajevo and Mostar International Airports Sector for Information and Communication Technologies (ICT) provides tools and services for automated, continuous and accurate monitoring at the complete aerodrome complex, processes, human resources and installed ICT systems. As a confirmation of this statement, we will take into account the work of the Transport Sector, whose business processes are largely automated and supported by ICT systems, and security services, where the ICT systems are used at most benefits: CCTV, Access control, KD control, Alarm Systems, fire alarm, video analytics and others.

Sarajevo and Mostar International Airport currently owns and exploits all ICT systems possessed by all other modern world Airports. In the Sector for Information and Communication Technologies engineers and technicians are employed who are trained and certified by the world-renowned companies (Siemens, Solari, Atraxis, Avex, Panduit, Cisco, Motorola, HP, Dell, SITA, DLink, Cerberus and others) in the field of self-maintenance of Airport ICT systems. It is important to note that all the training is completed according to International Standards and Programs. The scope

of responsibility and accountability of the Sector, and the need of possessing different knowledge and skills in the profession, impose an obligation to the employeesof the Sector to carry out the daily work activities together, and to develop and implement new projects, which form a compact and harmonious team. Thus, the individual's awareness of the necessity of teamwork has been developed, which affects positive working atmosphere, professional staff response to work duties, strengthens creativity free of competition, with the aim of improving its business in our Sector and society as a whole. Most of the Airports ICT Systems that are currently used were developed by System users and employees in this Sector.

3.2. Information systems

3.2.1. FIDS – Flight Information Display System

A flight information display system (FIDS) is a computer system used in airports to display flight information to passengers, in which a computer system controls mechanical or electronic display boards or TV screens in order to display arrivals and departures flight information in real-time. The displays are located inside or around an airport terminal. A virtual version of a FIDS can also be found on most airport websites and teletext systems. In large airports, there are different sets of FIDS for each terminal or even each major airline. FIDS are used to assist passengers during air travel and people who want to pick up passengers after the flight.

Due to code sharing, one single flight may be represented by a series of different flight numbers, thus lines (for example, LH474 and AC9099), although one single aircraft operates that route at that given time. Lines may be sorted by time, airline name, or city.

3.2.2. HP – DSC – Departure Control System

HP Departure Control Services Baggage Reconciliation is offered for flights handled fully in this departure control system (DCS) or a different one. In the HP system, baggage details are created automatically by bag tag printing, read-in, or manual claim tag input. These tags are read in the baggage room, and the system matches it with the existing baggage tag in the passenger record of the respective flight.

The baggage reconciliation response then shows either an "ok to load" with the container number in green or "not ok to load" in red, depending on the passenger status—checked-in, boarded, or not checked-in.

3.2.3. World Tracer - System for Handling Lost Baggage

World Tracer is a SITA / IATA service provided for the tracking of lost or delayed baggage. It has been in operation for many years and used by many airlines, such as Qantas, Lufthansa and Emirates. The system also allows for the rapid determination of mishandled baggage.The WorldTracer service operates globally and can exchange information with each of the current 2200+ member airports. It tracks and follows luggage for up to 100 days and it collaborates with other similar services. The WorldTracer internet interface allows passengers to track the bags by entering a transaction number.

Whenever a baggage is found without an owner, it can be registered as an on-hand baggage. It is then automatically matched with various missing-baggage files (called AHLs) all over the world. Whenever an on-hand gets a likely match, the station that has registered the missing baggage receives an alert. The bag is matched based on the baggage's routing number, tag number, passenger's surname, type of baggage, and content. When a handling agent finds an on-hand which matches one of their AHLs, he/she can request the on-hand by sending a message to the station that registered the on-hand baggage.

The format of the tracking number is AAABBNNNNN, where AAA is the airport's IATA-Code, BB is the airline's IATA-Code, and NNNNN is a 5 digit tracking number. For example, PHLDL19676 is from Philadelphia International Airport, flew on Delta Airlines, and has the tracking number of 19676.

3.2.4. PAS – Public Announcement System

A public address system (PA system) is an electronic sound amplification and distribution system with a microphone, amplifier and loudspeakers, used to allow a person to address a large public, for example for announcements of movements at large and noisy air and rail terminals or at a sports stadium. The term is also used for systems which

may additionally have a mixing console, and amplifiers and loudspeakers suitable for music as well as speech, used to reinforce a sound source, such as recorded music or a person giving a speech or distributing the sound throughout a venue or building.

Simple PA systems are often used in small venues such as school auditoriums, churches, and small bars. PA systems with many speakers are widely used to make announcements in public, institutional and commercial buildings and locations. Intercom systems, installed in many buildings, have microphones in many rooms allowing the occupants to respond to announcements.

4. Conclusion

Information systems are based on information and communication technologies. These technologies fall into the key generic technologies as they are penetrating all spheres of economy, science, social and private life and bring radical changes.

As short term often is used as an ICT, in everyday speech involves the use of a wide range of technologies, from computer, which manipulate and manage data and information across the industrial robot developed in industries, communications technologies, such as the computer network, Internet, to radio and television. For this reason, often in everyday speech it can be heard in different contexts.

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