

Proposal of Improvements Based on New Technologies for the Satisfaction of Passengers on Board Passenger Ship

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Abstract

In this paper is considered as the need for data from passenger perceptions and valuations of passengers, together with the study of some different opinions of experts in the sector of passenger transport by sea on board in different types of ships to develop global applications in real time that allow to offer services on board according to the habits of the passage.

These applications should have two aspects: sensors-rdfr card readers and data mining and / or touch screens in staterooms, along with smartphone, with specific applications when you enjoy excursions at the destination ports.

It is concluded that evaluations-passenger satisfaction assessments, based on opinion polling on different services provided on passenger ships, should show us which are the most valued and least valued on-board services, which are considered to be the most appropriate to propose formulas and improvement measures.

Keywords: Smart city, Passenger ship, New technologies

1. Introduction

In today's society, the concepts of consumption, leisure and satisfaction are directly related to tools or supports based on new technology through app applications for Smartphone, or multimedia systems of management of attention to the passage. On board passenger ships it is proposed that through photographic data of the passage and by means of the analysis of its behavior.

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Through physiognomic aspects, that the compilation of the same are turned to databases and used to develop statistics of characteristics and typology of the passage in real time, and that serves as an aid to the attention to the passage that is on board.

This justifies that the development of applications on board passenger ships, especially on cruises, is currently in full swing. With the difficulty of the connection is made through satellite signal, and in the constant search for cost reduction and technical improvements in this concept. The big cruise companies are those who have a proposal based on new technologies in order to facilitate and satisfy the demands and needs of passengers on board. For example, Royal Caribbean is the company that is most committed to technological advancement, with several SMART proposals, aboard its ships. Other companies such as Costa Cruises, Carnival and MSC Cruises, propose innovative ideas and projects based on new technologies in their ships, reducing the connectivity on board, proposing the socialization of the passage through social networks, as well as through large Alliances with powerful telecommunications companies to raise innovations in communication and last generation with the sole purpose of satisfying the passenger on board.

This is already a reality on the way to improving on-board telecommunication costs and services, with products such as smart connect, (14) or formulas and improvement tools such as those contemplated in this article or similar to those implemented on ships Of Royal Caribbeann, such as: Internet booths, with cabin privacy with special access equipment, costing \$ 100 for 7 days on board. Another formula they have implemented in this shipping line for internet access is through wireless wifi access, with six active zones on board each ship, with prepaid cards of \$ 10

per day. Finally, these ships have internet café, for access to emails and internet, costing \$ 150 per 500 minutes.

Another aspect for shipping companies, at present, is to boost the motivation and involvement of their crew on board, for this, through new technologies the shipping companies encourage and bet on improvements in communication with the family (large motivator axis on board). In this sense, the company Royal Caribean (14) chose to equip 40,000 of its crew with tablets at the time of shipment. The objective was to facilitate communication with the outside by reducing communications and making leisure, as well as online training activities possible. This had a positive impact on the motivational and emotional axes of the passenger ship crew and generated a positive link and predisposition when carrying out the work on board. Also in the company, MSC Cruises (10), the proposal in new technologies is based on the strategic alliance pact with Samsung in order to equip the next generation MSC ship. It is to equip the last nautical constructions planned for December 2017, of new devices of last generation that includes: Totems screens high definition cabins, common areas and digital signage. Mobile solutions, Smartphone, touch screens and accessories. Medical equipment, specialized technology for medical centers on board, which provides up to video-medical consultations in case of emergencies.

The objective of this paper is to propose a globalized and flexible automatic system that measures habits, routines, trends in the consumption of the passage when embarking on a ship. All this together with the possibility of interacting with the idea of smart city, when the vessel is in a destination port, promotes and favors a high index of satisfaction of the expectations and emotions of the passenger with the final choice, when traveling on board of a passenger ship.

From this data they are developed applications in real time that allow to offer services on board, customized according to the habits of the passage. These applications have two aspects: sensors-rdfi card readers and data mining and / or touch screens in cabins, along with smartphone, with specific applications when you enjoy excursions in the ports of call.

The rest of the article is structured as follows: in section 2 a proposal is made to follow the passage. Section 3 discusses the technological proposal. It concludes with a section of conclusions about the work.

2. Proposal for Tracking of the passage

Starting from the concept of traceability, at the moment in which the passenger chooses and is prepared to make a trip aboard a passenger ship, he will have a support that through photography with a smart physonomy application, will

provide guarantees in Real time of: security (tipping to interpol, police, port authorities, etc.), scanning function (ISPS code) (international regulation a-ccess control after 11S), microship system attached to billable baggage, boarding card / Bracelet rdfi incorporated, listing of the passage with photographic reference. ...

This multimedia identification and under a physiognomic support not only provides safety, agile and efficient service to the passenger, but also the analysis of the behavior and the standard of the typology of the majority passage that embarks on that cruise that facilitates the attention to the passage during its Stay on board, enhancing the personalization of the same, enabling:

- a) Agile / fast embarkation of the passage.
- b) Identification of the passenger inside the boat.
- c) Control of the safety of the passage. For example, determination of enabled zones according to profiles, identification of entrances and exits of the boat, etc.

With this initial identification data will develop real-time applications based on the habits and routines of passengers on board. For this and in a double aspect, the intrinsically linked to the service on board and customized for the passenger based on techniques of sensors / readers and card / bracelets rdfi, next to data mining [Netz, 2015], that through kiosk Totem, in common areas of the ship or Tablet customized in the cabins, that will allow improvements for the passage, the shipping company and the crew.

This is intended to design a digital platform of services focused on passenger ships with the purpose of creating a new format of travel tailored to the user, offering a range of possibilities additional to those already existing and with a friendly and clear management when possible. This way of conceiving travel is based on the consideration of treating each user as the center of the service offer. The approach adopted will be possible thanks to the use of techniques within the scope of augmented reality.

The services provided can be considered from two different perspectives. On the one hand, it contemplates the point of view of the shipping company, in charge of managing the passenger ship; And on the other that of the user, the passenger. In this sense, it is possible to define two levels of provision of well differentiated services. Below are some of these services, subject to the possible approaches presented.

2.1. Improvements to the ticket

In reference to the passage the following improvements are intended:

1. Adaptation of the cruise according to the profile of each passenger.

2. Restoration according to tastes and pathology (allergies, diabetes etc).
3. Particularization of different environments in the cruise (accommodation lights, climate, blinds, ambient music, etc.).
4. Personalization of activities and leisure. Management of leisure offers on board (reservations, shopping on board, gym, spa, etc).
5. Electronic payment through identification bracelet. Real-time on-board expenditure control.
6. Personalization according to consumption profiles (VIP, business, economic, family, students, etc).
7. On-board localization system and interaction with the services and activities provided on board.
8. System of LCD screens, in interior cabins that make the stay more pleasant with rotating landscapes.
9. Chat capability and intercommunication with other passengers on the same vessel, enhancing connectivity.
10. Application for blind passengers with reduced mobility.
11. Cicerone port Deneb, application for a flexible choice by the passenger of excursions and visits in ports of destination. This application will be endowed with institutional information and hospitality, leisure, cultural activities and interactive guide of the port of call, with option of offers and discounts that enhance the free choice of the passenger, along with responsible consumption.



Picture n° 1: The proposed platform Smart Ship Deneb

2.2. Improvements for the shipping company and the crew.

In reference to the shipping company and the crew, the following improvements are intended:

1. Social Proposal: Through Tablet motivate the crew in an excellent attention to the passage, as a guarantee

of loyalty. Motivation linked in families connection through SKY system.

2. Application that analyses the fluctuation of the passage on board, in order to optimize the service on board and provide it with the necessary personnel. More personal to the services most demanded. Organization and management of human resources.

3. On-board location system: Especially interesting at the time of emergency management and control.

4. Direct application of on-board service management. Analysis of timescales and demand for services.

5. On-line training platform for the crew for continuous improvement in attention to the passage.

6. Statistical studies of on-board services.

7. Collection and recording of data to make decisions in the on-board Service Department [Crivat, 2006].

8. Stock Control.

2.3 Disadvantages of the proposed system

In accordance with the three basic principles of the passenger service software application, the proposed system needs to be user friendly, designed to accommodate state-of-the-art passenger care and clearly and consistently focused on delivering the type of service required by the quality standards established by a given shipping company.

It is conceived as a highly flexible, high capacity data capture system. Although it incorporates a highly intuitive interface for ease of use by passengers of all types, older people who are not so well versed in new technology may have some difficulty using the proposed platform.

Additionally, in view of the countless variables and potential improvements for both passengers and crew, the cost of the application may seem high. It should, however, be taken into account that while in the world of sea travel, costs and prices may be high in terms of the initial outlay, solutions are financially viable as the investment is rapidly recovered, thanks to their use in tourism and as a result of the improved efficiency of on-board services and increased on-board consumption by passengers.

To give an idea of the figures involved, for a medium-sized ship with a length of 216, beam of 29 m, 8 decks with on-board services for 1800 passengers and 600 crew members and 622 cabins, the price of the proposed solution with features such as RFID, digital kiosks, RFID signage and Ethernet cabling amounts to 5% of the cost of building a new ship, which would be in the region of EUR 980 million.

Financial viability and payback are analysed from the dual perspective of intangible concepts, such as passenger satisfaction and on-board service efficiency on the one hand, and tangible concepts, such as reduced waiting times for passen-

ger service and care, lower staffing (crew) costs and improved on-board tracking and security on the other.

3 Analysis of the contribution

3.1 Previous study

This paper presents a SMART SHIP DENEb work platform as a flexible and global application, providing agile and efficient solutions. The data obtained from the same together with the expert opinion leads us to propose a tool to minimize and improve the fields that in services on board are worse valued by the passage that embarks in different types of passenger ships.

It is therefore a matter of adequately integrating digital media into the ship with a passenger-centric communication strategy; Global and local communication at the same time. The variety of supports and digital and interactive formats provides adequate functions to each room on board. In this way, SMART SHIP DENEb allows us to communicate our own services and promotions in different areas, such as the reception, cafeteria, restaurant, gym, etc., such as being guided and advised when visiting a port in our trip. At the same time the capacity of a free choice of those services that demand or like. Likewise, this system proposes improvements in motivating and on-board involvement for crew members of passenger ships.

Logically an analysis of data obtained from people has a prior consideration of the subjectivity of the concepts of valuation and analysis in terms of perceptions of the globality of the passage probed, subject to infinity of casuistry, eventualities, personal nuances ... etc, more if it is possible to evaluate or evaluate concepts of service on board in a medium unknown for most as it is a vessel.

An in-depth analysis of passenger ratings and opinions on different passenger ships, through a comprehensive field study on different types of passenger ships, through questionnaires, interviews and bibliography, will lead us to obtain the services and issues on board more valued and those of less valuation, being considered these the most suitable ones when it comes to proposing formulas and measures of improvement that we propose.

These valuations in passenger satisfaction, based on opinion polling on different services provided on passenger ships, will be achieved, broken down into this group by type of vessel, routes, duration, etc. All valuations will be checked for services on board dispensed and valued by the passenger, elaborating different valuation reports for services, shipping, circuit, ... etc.

Based on the experimental data obtained for each type of passenger ship (cruise, river cruiser, ROPAX and High

Speed), the ideal situation is determined for the passenger and the crew member, towards which the services provided should always be provided on board a Passenger Ship.

The resulting data are confronted with the opinions polled by experts on different passenger ships and in related sectors such as Hotel Resorts.

The opinion of experts surveyed ratifies and reinforces that, in the case of valuations or negative service experiences in the study, the proposed proposal is a useful tool for the Services sector on board passenger ships.

After a detailed analysis of passengers' perceptions and valuations, and with the study of some different opinions of experts in the sector of passenger transport by sea on different types of ships, show us that due to deficiencies and inadequate situations, for the passenger in terms of service, it would be the ability to establish and implement a system based on new technologies, and where, according to the experts surveyed, the different cases and situations that to our passengers, are deficient or have not met the expected expectations before starting a trip on board.

3.2 Technological contribution

The technological contribution that the objective of the pre-se raises is the design of a digital platform of services focused on passenger ships with the purpose of creating a new format of trip adapted to the user, (internal-crew, external-passenger) offering a range of Possibilities additional to those already existing and with a friendly and, as far as possible, clean management. This way of conceiving travel is based on the consideration of treating each user as the center of the offer of services of a shipping company for its internal and external clients. The approach adopted will be possible thanks to the use of techniques within the scope of augmented reality.

The provision of the reported services must be carried out according to the establishment of an advanced technological infrastructure that allows complex computational operations in real time.

The main characteristics considered in the proposed system revolve around the concept of ship, assuming that the services provided will be autonomous from the point of view that the ship will not depend on other higher infrastructures (satellite communications, etc.). This consideration is motivated by the fact that the ship may be large intervals of time without connectivity with terrestrial infrastructures of data communications with wide bandwidth and, not necessarily, there will be extraordinary mechanisms of communications (satellites), with a cost reduction in the before mentioned services, as currently contemplated.

It will be assumed that internal crew members as external passengers have a unique profile, identified with their personal card, so it will be necessary to adapt each service provided to that profile. This consideration will range from segregation by age (infants, children, adults, elderly, etc.) and sex, to economic typologies (tariffs, economic, business, etc.), through typologies associated with nationalities, , etc..

The identification will be made by various mechanisms, depending on the service and needs that will be provided and improved. Thus, access to enabled areas (cabins, wings, reserved spaces, etc.) will be done by radio frequency identification (11) (Near Field Communication, NFC). This identification requires carrying a unique emblem implemented as a bracelet. These devices execute passive tag role (it does not have autonomous feed element) so they require another active element with the role of reader to perform the identification. The distance between the two devices should not exceed 20 centimeters, so it is necessary for the passenger to wipe the wrist near the reader, creating a gesture of use.

In addition to this identification work, the device may contain additional functions associated with the context in which it is located. For example, body temperature, ambient temperature, humidity, heart rate, etc. Its use extends to the Internet of Things (IoT), in which all the elements that are wanted can be interconnected and exchanging information relevant for the interpretation of complex situations and in the framework of a Community use (eg fire safety and shipwrecks), improving the location of the crew and passengers.

Another type of identification can be made without the generation of this gesture, being the user not aware that the identification is being made. For this purpose, the use of fixed cameras installed in the boat is proposed as a use technology for the purpose of performing a facial identification. These techniques require a real-time local processing of facial features that can not only be used to identify the user but also to interpret their mood (smile, frown, closed eyes, open mouth, etc.). With this it is possible, for example, to determine if a work and coexistence environment is adequate or not.

Facial interpretation endows the system with not only an instant identification data. In addition, it is a source of historical data analysis that is important for conductal and behavioral studies. From a control system point of view, it can be identified that this information constitutes a feedback of the system. This reaction information of the internal crew member or passenger is of great value if the goal is to improve the user experience on board a passenger ship. It is therefore useful when taking decisions about comfort and satisfaction of the user, and to boost motivation and

minimizing the emotional deficiencies that are generated in long shipping periods.

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CUBIERTA DE PASAJE CAMAROTES - ESIORA 216 MTS 20 MTS DE MANGA
 INSTALACION 3 MÓDULOS TÍTANOS INTERACTIVOS 6300 EUROS
 CAMAROTES PAX 50 CAMAROTES A 800 EUROS 40000 EUROS
 PAX EN ESTA CUBIERTA 100 A 1 EUROS CADA UNO PULSERA IDENTIFICATIVA RFID 100 EUROS
 CABLEADO 3' FIBRA 216 MTS A 0,800 EUROS/MTR 1944 EUROS
 ANTENAS Y SENSORES 215 REPETIDORES A 2300 EUROS 494500 EUROS

Picture nº 2: Cobertura on board

This practice can be framed within the scope of the techniques of gamification, widely used in the optimization of the efficiency of the systems in which human beings participate.

In addition to the use of cameras and NFC wristbands, the use of high-level intelligent interfaces such as touch screens integrated in the boat or portable / smart devices (smartphones, tablets) is proposed, in order to widen the scope of interlocution between the System and the user. In this way the user is enabled to access to the system through applications tailored to his profile.

The choice of these interfaces, widely used in a domestic environment, will provide an exceptional channel for the generation of orders or for the valuation of services and working conditions on board. In this sense, these devices allow another way of integrating the crew member into the gamification mechanisms used to improve the passenger experience.

All proposed interfaces will be connected to the system through Wi-Fi access points present in the entire area that can be accessed by passengers and crew.

With the information gathered through the technology discussed and with the data relating to each crew member (affective needs, communication families, leisure and fun, etc.) and habits and routines of consumption on board passengers, it will be possible to perform a detailed analysis to constitute with a tool of aid and improvement in the day to day on board. That is, the system can take a proactive role to the user, instead of being reactive to their requests, suggesting proposals and getting ahead of their activity.

This approach becomes feasible thanks to the use of data mining techniques in systems where a large volume of information (Big Data) is correlated. The system proposed will have a powerful computer system but perfectly adaptable to the environment (boat), being a center of reception of the information captured by the various systems

of interaction with the passage (bracelets, smartphones, tablets, cameras, etc.)

Conclusions

The main conclusion is that the improvement of the passenger's stay, using SMART SHIP DENEb as a working platform, provides agile and efficient solutions for the on-board passage and in its capacity of choice, which can be quantified in terms of its fidelity as possible customer of new cruises.

This proposed global system is of great interest in improving the communication with the crew; It becomes an interesting training tool, optimizing the HR on board, allowing the shipping companies to transmit messages and strategies to improve passenger satisfaction and the everyday life of crew on board passenger ships.

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