INFORMATION AND COMMUNICATION TECHNOLOGY IN TOURISM

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Abstract

Tourism is a major pillar of the global economy, significantly shaped by modern information and communication technologies (ICTs), including the Internet. These advances have revolutionized information dissemination and spurred innovations within the tourism industry. Known as „electronic tourism" or „e-tourism," this transformation involves the digitization and modernization of industry infrastructure and operations. ICT integration has led to the development of innovative tools and platforms, enhancing efficiency, personalization, and interactivity for both providers and consumers. Technologies such as online booking systems, virtual tours, customer relationship management (CRM), and targeted marketing are now essential for operational efficiency, customer satisfaction, and market reach. Moreover, ICTs play a crucial role in strategic planning and decision-making. By analyzing big data and utilizing sophisticated analytics, tourism businesses can gain insights into market trends, consumer preferences, and competitive dynamics, enabling informed decisions and adaptation to the digital age.

Key Words: *information systems in tourism, the use of information and communication technologies in air transportation, hotels and travel agencies, e-tourism*
JEL classification: *R1, Q22*

Introduction

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The tourism industry is a dynamic and ever-changing sector of the economy. Tourism is a dynamic industry that introduces novel destinations, arrangements, and travel categories, all the while requiring inventive management techniques, resources, and strategies, as well as continuous innovation. An instance of innovation within the tourism industry pertains to the integration of modern information and communication technologies into the operational structure of businesses operating in the sector. As an economic activity, tourism has an effect on economic development. As a result, contemporary information and communication technologies ought to improve and advance businesses (with an effect on profitability), stimulate tourism, and raise the living standards of the region's residents.

Contemporary information and communication technologies facilitate an enhanced correlation between the supply and demand of tourists on the market, thereby revolutionizing the distribution of package deals and empowering tourism enterprises to adopt inventive instruments that can bolster their international footprint. Expanding business operations internationally and establishing more extensive distribution channels to optimize the positioning of products are essential components of the global tourist market.

An expanding array of services provided to tourists within the tourism industry are dependent on the Internet as their principal mode of communication. Information is vital to the tourism industry, and the Internet provides the quickest and most efficient means of transmitting and exchanging this data. By eradicating currency constraints, surmounting language barriers, and eroding geographical boundaries, the Internet has fundamentally transformed business operations. The facilitation of effective and timely communication, the transmission of significant amounts of data over long distances, the publication and modification of multimedia files with continuous accessibility, the digital distribution of services and products, and the creation of virtual entities are all achieved. The applications of contemporary information technologies in hotels, air traffic, and travel agencies – critical sectors of the tourism industry – will be the subject of this paper. It will examine how these technologies can increase competitiveness, productivity, and efficiency in the tourism industry, as well as how they contribute to its modernization and digitization. The objective of sustainable tourism development is to meet the needs of current visitors and the local

community while simultaneously preserving and enhancing future prospects (Smolović & Kuzman, 2020).

Application of information and communication technologies in air traffic

Airlines, by virtue of the complex dynamics of their operations, are forerunners in acknowledging the imperative nature of making investments in information technology. These corporations played a pivotal role in the initial phases of innovation development and dissemination. At the outset, telephone reservations were conducted manually; the initial implementation of a centralised reservation system occurred during the 1960s. These were internal systems that granted travel agencies direct access to seat availability and pricing information, in addition to the capability to complete reservations. Before the development of global distribution systems and modern online reservation platforms, there were central reservation systems. These early systems were essential for managing bookings and reservations in the tourism industry. They served as the foundation for the advanced technologies we use today, making it possible to organize and streamline the booking process efficiently. The liberalisation of the aviation industry and the expansion of air travel contribute to the widespread adoption of Computer Reservation Systems (CRS) across vast computer networks. By accommodating demand-driven adjustments to pricing and scheduling, CRSs have enabled businesses to remain competitive (Buhalis & Law, 2008). A Computer Reservation System (CRS) is an information-gathering, data storage, and processing system designed to manage transactions pertaining to travel. Since the mid-1980s, CRS has undergone substantial development into a prominent Global Distribution System (GDS), offering a wide range of tourism-related products and services including vehicle rental, accommodation reservations, and airline transparency. Additionally, communication between airlines and travel agencies is facilitated.

Global computer systems are information systems created primarily for distributing merchandise to visitors. GDS consolidates information from many travel sectors, streamlines the booking and sale of desired services, unifies all visitor services, connects service providers with end users, and ultimately improves the quality of services. (Buhalis & Law, 2008) affirmed this.

Figure 1: *GDS connects service providers and end users*
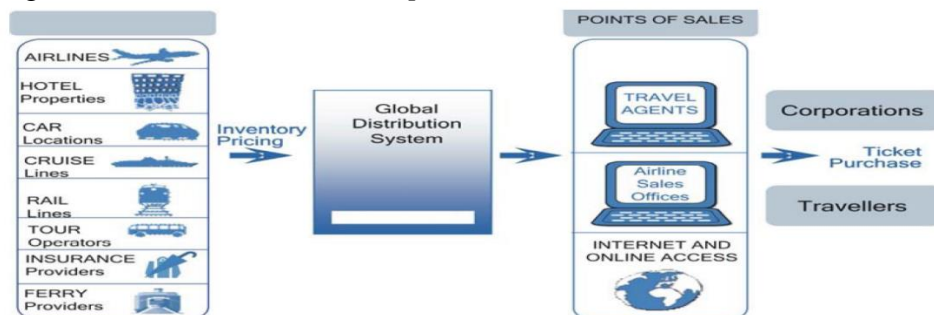
Source: *Njeguš, (2010, p. 179).*

GDS provides a variety of services to its customers before they leave and upon arrival at their destinations. GDS offers reservations and information for various tourist services such as accommodations, car rentals, flight itineraries, and more.

Sismanidou et al., (2009) list four major Global Distribution Systems (GDS): Amadeus, SABRE, Worldspan, and Galileo. Furthermore, there are other smaller or local Global Distribution Systems (GDSs) that serve specific nations or areas, such as SITA Sahara, Infini (Japan), Axess (Japan), Tapas (Korea), Fantasia (South Pacific), and Abacus (Asia/Pacific), among others. Currently, most airline companies have fully integrated automation in multiple areas of their operations, such as bookings, ticketing, passenger check-in, sharing flight schedules, pricing transportation services, and more. Traditional organisations must recognise the need to overhaul their cost structures, distribution operations, and pricing techniques. Contemporary airlines commonly use the internet (Gholami et al., 2008).
- increasing interactivity and building relationships with consumers and business partners,
- online booking,
- electronic accounting,
- for revenue management,
- electronic auctions of places (seats) available at the last minute,
- maximizing the productivity of new electronic distribution media.

In order to increase self-service, 98% of airline companies intend to invest in the enhancement of existing sales channels and the introduction of new channels within the next three years, according to research conducted by SITA in 2013. According to the research findings, the

airline company's website presently serves as the primary sales channel for generating ancillary revenue. This trend is anticipated to persist, although mobile commerce is projected to experience substantial growth.

At present, 37% of assistance that does not sell is conducted via websites, 2.4% via mobile devices. It is anticipated that the mobile channel will contribute approximately 11.6% of total ancillary sales until 2017, which is approximately five times more (Figure 2).

While this objective may seem ambitious, it is crucial to also take into account other pertinent factors. To whom do you make reference? A portion of them are oriented in that particular direction (SITA, 2014):
  - The number of smart phone users is growing.
  - Travelers are already familiar with e-commerce, so mobile commerce is not a big leap for them.
  - Mobile phones are with passengers during the flight and provide significant opportunities before, after and during the flight.

Figure 2: *Percentage of sales through new channels*
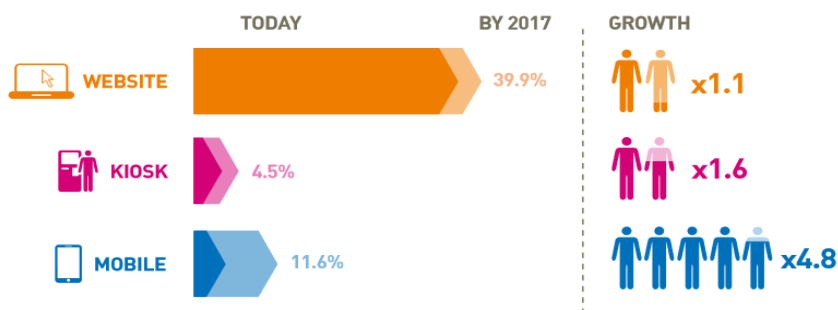
Source: *SITA (2014, p. 8).*

Airlines have ambitious goals. They are now offering their services through smartphones and websites. By 2017, nearly 75% of the airline sector aims to achieve this. In three years, 70% of airlines are expected to use this strategy to increase revenue. Additionally, websites will be customized and enhanced to meet the needs of mobile phone users.

According to research, mobile commerce will advance, and its applications and services will be utilized more frequently through 2017; this will have an impact on the expansion of this sales channel (Figure 3). On the basis of the provided research, namely the observed trend of growth in mobile commerce applications, we will attempt to implement

and develop mobile business and services-applications of mobile commerce in tourism-focused companies from the Kosanica region, so that these companies may attain parity with their global counterparts in terms of information and communication technology implementation.

Figure 3: *Airline use of mobile commerce*
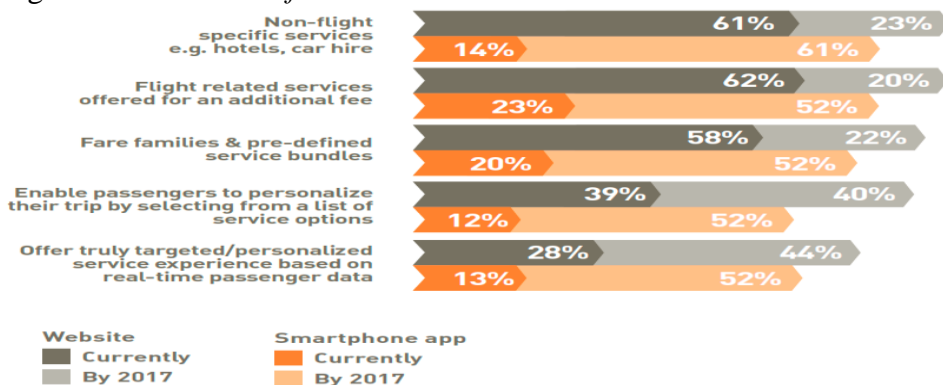
Source: *SITA (2014, p. 9).*

Application of information and communication technologies in the hotel industry

Many hotels worldwide utilize information and communication technologies to optimize operations such as room management, reservation processing, and billing. Hotels are increasingly investing in information technology and glass to enhance the efficiency of their business operations. Has this led to any noticeable enhancement? Efficiency (Ham et al., 2005). Moreover, the main purpose of information technologies in the hotel business is to improve productivity. Historically, information sources have been crucial for the proper execution of hotel operations (Ham et al., 2005).

Enhanced profitability stems from the combined goals of boosting productivity and reducing operational costs, which are essential for the effective functioning of any firm. The objectives are achieved through the use of information systems, resulting in enhanced productivity of hospitality companies, greater guest turnover, reduced business expenses, and other benefits (Cobanoglu et al., 2001).

Hotels of different sizes can gain various advantages from using information and communication technology. Improved effectiveness is a

direct result of reduced costs and higher income. Another advantage is improved client connections and service quality, which result from the chance for direct communication and personal engagement (Wang, 2008). Hotel operations follow market principles but also have certain characteristics specific to the business. Effective company organisation is essential for delivering high-quality service and achieving success in business. The rise of information technology has made this possible (Siguaw et al., 2000).

Hotels use information and communication technologies to enhance profitability and optimise operations. Their technologies not only help with managing and distributing electronic media but also support operational and planning tasks that improve marketing, research, planning, and reservation management.

Ham et al. (2005) and Lam et al. (2007) assert that the hotel industry heavily relies on information technology (IT) to improve productivity, maximise employee efficiency, guarantee customer satisfaction, sustain competitiveness, and ensure survival in a rapidly changing digital market.

Several researchers have found a direct relationship between investing in IT and the productivity and performance of organisations (Byrd & Turner, 2001; Powell & Dent-Micallef, 1997; Rai et al., 1997). Chan and Law (2006) argue that websites are essential for enhancing corporate strategy and communication. The website's ranking, usability, and user-friendliness of its functions are crucial aspects that impact the effectiveness of this strategy and the automated evaluation of the website. Hotel organisations' administration chooses an information system that aligns with the organization's goal and commercial vision. This pertains to the establishment's geographical position, size, target market, and the extent of the hotel company's activities. Information systems facilitate the quick access of data from different levels of the organisation, making them essential for making well-informed business decisions. A Poon, 1993 delineates the current utilisation of computer technology in the hotel business into three phases:
  - bookkeeping phase (accounting, billing, marketing in distribution and sales);
  - administrative phase (all types of service reservations, business processes at the reception divided by phases of the guest cycle, which primarily refer to

- records and reports including „back office" jobs as well as accommodation management);
- tactical phase (technique, technology and telecommunication systems, security, control, and supervision).

The interoperability of the subsystems comprising these stages is critical to the effectiveness of hotel operations. Modern business operations, including those of the hotel industry, involve a substantial amount of data. In order to efficiently manage a significant amount of data, the establishment of an information system that supports and streamlines the hotel's operations as a whole is required. Modern hotels have adopted information systems for business management in order to satisfy the increasingly critical demands of their clientele and guarantee sustained prosperity. Computer Reservation Systems (CRS) and Property Management Systems (PMSs) are integral components of the hotel industry, serving critical functions such as monitoring visitor histories and managing revenue (Njeguš, 2010). „Guest history" is information stored in the visitor database that is accessible via Hospitality CRS. In addition to collecting personal data (e.g., gender, age, contact information, place of residence, occupation, and card numbers), the hotel also gathers information regarding guests' preferences and routines throughout their sojourn. Continually monitoring the desires, requirements, and inclinations of the patron significantly improves subsequent collaborative efforts. Property Management Systems is a hotel operations management system. Project Management Systems (PMS) aid in the implementation of routine operational duties within a lodging establishment, including but not limited to employee management, sales, reception, restaurant operations, and financial monitoring.

Application of information and communication technologies in tourism agencies

Travel agencies depend on information and communication technology as essential tools for mediating between suppliers and clients, as well as for providing information and making reservations.

The Internet has brought about substantial changes in the travel agency industry. Tourist companies who efficiently employ online distribution channels would have easier access to the global market (Brunger, 2006). Travel agencies were once seen as providers, akin to agents, who were paid a commission for their services. The new distribution mechanism

encourages travel agencies to proactively change how they conduct business, allowing them to gain a significant competitive advantage. Small-scale tourist businesses can now reach a broader market thanks to technological improvements. Golob & Regan (2001) emphasise the use of GDS (Global Distribution System) converters and marketers by local tourism agencies to enhance their offerings and achieve a real competitive edge. GDS is expected to serve as the basis for dynamic packaging, allowing travellers to buy services and organise their travels online. With the increasing quantity of services bought directly by travellers, travel agencies must make operational changes. They are shifting from being mediators of tourist services to becoming travel advisors. Tourists benefit from the advisory role by using the Internet to make decisions more efficiently, economically, and accurately (Đurašević, 2007). Travel agencies were hesitant to fully recognise the possibilities of information and communication technology in the past, mainly for the reasons outlined by (Buhalis & Law, 2008).
- limited strategic scope;
- lack of IT experts;
- low profit margins that prevent investment;
- focusing on human interactions with consumers.

This resulted in a low level of ICT integration and capitalization on the Internet. Many agencies still do not have access to the Internet and cannot access online information or suppliers, so their credibility in the market is greatly reduced. This may call into question their ability to maintain their competitiveness.

Travel agents who ignore new technologies or avoid using them due to high costs and a lack of professional staff reduce their chances of competing and adapting to the dynamic market environment (Mamaghani, 2009)

The factors that increase this threat are (Buhalis & Law, 2008):
- consumers are increasingly looking for information and making reservations on the Internet ;
- principals aim to control distribution costs, communicating directly with consumers and developing customer relationship management;
- reduce commissions ;
- travel agencies are limited by expertise, by employing insufficiently trained staff.

Travel agencies on a global scale are compelled to utilize the Internet more and more in order to communicate with clients, market their services, and recruit customers, in addition to gain access to travel suppliers and information. To augment their client service, conventional travel companies should incorporate supplementary products and services into their primary offerings via the Internet. Moreover, by leveraging the Internet, they are able to target specific market segments and offer specialised services within those industries.

Conclusion

Success in business nowadays relies heavily on utilising modern information and communication technology due to the rise of economic regionalization and global market integration. Contemporary information and communication technologies, such as the Internet, have the primary advantage of overcoming limitations related to time and distance. In modern times, time is considered the most precious commodity. More people are using the Internet to gather information instead of physically going to tourism companies, which would require time and money, due to their busy schedules and limited free time. Businesses are increasingly using Internet advertising and improving their online services by utilising these technologies. Many tourism-related organisations are required to reorganise their operations to make use of modern information and communication technology in the present business environment. Reengineering allows companies to survive, function, and compete in a highly unpredictable market while improving operations, increasing productivity, and cutting costs. These businesses are currently well-placed to take advantage of significant prospects.

Acknowledgement

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