THE ROLE OF INFORMATION COMMUNICATION TECHNOLOGIES IN TOURISM INDUSTRY

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Abstract: Tourism is considered to be one the world's largest industries. Its contribution to gross national product, employment and economic development is very important and, unlike many other sectors, it is forecast to grow in importance in the coming decades as leisure time increases.

Tourism is specifically influenced and transformed by ICT development. Over the years ICT has changed how the tourism industry works and has altered its structure, making it more efficient. Using information technologies, tourism organizations gain advantages in terms of cost reduction, revenue growth and customer retention. E-tourism is revolutionizing the entire value chain, as well as the relations of tourism organizations with all interested parties.

For this reason, the aim of this paper is to analyse the role of information and communication technologies in the tourism industry and to synthesis the developments in technology for tourism.

Keywords: Tourism, Internet, Information and Communication Technologies, E-tourism.

INTRODUCTION

Tourism is reputed to be the world's largest industry. Its revenues support a significant proportion of the economies of many nations and it is one of the largest employers worldwide. Its contribution to gross national product, employment and regional development are well documented and, unlike many other sectors, it is forecast to grow in importance in the coming decades as leisure time increases.

Tourism is acknowledged to be very information intensive. Tourists need information before going on a trip to help them plan and choose between options, and also increasingly need information during the trip as the trend towards more independent travel increases. In modern societies, time has become a scarce commodity. Therefore, for many consumers their annual holiday represents a major emotional investment that cannot easily be replaced if something goes wrong. Therefore, since travellers cannot pre-test the product or easily get their money back if the trip does not meet up to their expectations, access to accurate, reliable, timely and relevant information is essential to help them make an appropriate choice. It is notable that the greater the degree of perceived risk in a pre-purchase context, the greater the consumer propensity to seek information about the product.[1]

This need for information is heightened by certain characteristics of the tourism product. Foremost among these is its intangibility- unlike manufactured goods, the tourism product cannot be inspected prior to purchase and therefore it is almost completely dependent on representations and descriptions to help consumers make a purchase decision. It is also fixed geographically, and thus the customer must travel and thus in effect consume the product- to experience what they are buying. Two other characteristics are its complexity and its interdependence. Individual tourism products are diverse, and in many cases, it is this heterogeneity which makes them attractive in the first place. In addition, tourism products are rarely bought individually, and the endless combinations and permutations of alternative travel routes,

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[1] Hughes, Moscardo 2019.

transportation modes, time and lodging accommodations make travel decisions difficult even for the initiated. Suppliers, therefore, face a challenge, which is described as trying to gain identity with untold millions of potential customers covering the whole spectrum of incomes, interests, knowledge, sophistication and needs. Even the simplest trip means trying to match the expectations of diverse travellers to the bewildering array of choices and options provided by millions of tourism suppliers each trying to differentiate themselves from their competitors. Given that millions of people travel every day, it can be seen that the communication of accurate, current and relevant information is essential to the efficient operation of the tourism industry.

The world tourism industry has certainly been one of the first to make large-scale use of new information technologies; focusing on information and communication technologies it appears that technological progress over the past thirty years has allowed the most innovative tourism enterprises to redefine not only their own organizational structure but their relationships with partner organizations, thus achieving the twin goals of optimizing operating costs and increasing ability to generate value for their customers. There have been three main innovation waves impacting the tourism scenario in recent decades: the development of the Computer Reservation System in the 70s; the development of the Global Distribution System in the 80s; the Internet in the 90s.[2]

COMPUTER RESERVATION SYSTEM AND GLOBAL DISTRIBUTION SYSTEM

These innovations made it possible to create, develop and globalize the availability of basic tourist services through the intermediation of travel agencies which had exclusive access to automated booking systems. These booking systems are based on proprietary networks which are very sophisticated from the technological point of view and have very high implementation and running costs. They are the means currently used for purchasing tourist services and packages through Travel Agencies.

A Global Distribution System[3] is basically a network connecting and integrating the automated booking systems of different organizations, reaching the end user through the intermediation of a travel agency Global Distribution System originates from airlines. The supply of such services is presently highly concentrated, with four global suppliers owned by airlines companies: Sabre, Amadeus, Galileo International and Worldspan. Their presence is based upon a network of agreements with local partners ensuring access to travel agencies all over the world. The main features of these systems are:

- the network is based on proprietary systems accessible only to professional users;
- the high costs of implementing and running them;
- the players involved are mainly large multinational players (hotel chains, airline companies);
- they are not commercial brands, as they are not known by the final users and are not visible on the market; this poses constraints to the successful exploitation of the end users' market.

The technological innovation brought about by Global Distribution System broadened the gap between large and medium or small suppliers of tourist services, as only the former could actually benefit from broader market access and the enhanced level of service.

The advent of the Internet changed the scenario: all categories of players are now directly accessible and have implemented their Internet strategy. The Internet provides all players with a means of reaching end users and being reached by them. The big tourist organizations rapidly implemented Internet strategies and set up their own Internet business areas or, in some cases, specific divisions or companies. In addition, the Internet has extended this possibility to the end user, redefining the business system and the notion of the channel of tourism products, in that it gives access to technologies to large masses of potential consumers and tourism enterprises of all sizes.

The exploitation of opportunities related to the Internet, however, is not automatic, as it requires the definition of a marketing strategy calling for changes in structure and organization, not to mention the importance of a communication strategy. Many Internet-based organizations had unrealistic expectations and inadequate business models and eventually failed. The implementation of an Internet strategy has to

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[2]   Khatri 2019.
[3]   https://www.revfine.com/global-distribution-system/

take into account a number of challenges, including the compatibility of pricing strategies over different channels and the channel conflicts that may arise.[4]

For the "traditional" intermediaries (Global Distribution System, tour operators, travel agencies), the Internet means opportunities for broadening their activity but also forces them to justify their existence. For example, airlines put pressure on Global Distribution Systems to reduce costs or eliminate them and sell directly through the Internet. The four Global Distribution Systems brought their databases onto the web either directly (Amadeus and Galileo) or through newly created brands (Sabre established travelocity.com). They are also becoming providers of Internet-based solutions to the other players in the value chain. Tour operators and travel agencies increasingly use the web as an additional channel to sell products to end users.

The Role of Information and Communication Technologies (ICT)

As can be seen from the above discussion, the exchange of information is very important at every stage in the sales cycle of the tourism product. The information must be able to flow quickly and accurately between the client, intermediaries and each of the tourism suppliers involved in servicing the client's needs. As a result, ICT has become an almost universal feature of the tourism industry. Its power allows information to be managed more effectively, and transported worldwide almost instantly. As a result, it has had (and continues to have) a major effect on the methods of operation of the tourism industry. However, it has not affected all functions and sectors equally. It is having the greatest impact on the marketing and distribution functions, while leaving others which need more human contact relatively untouched. Similarly, certain sectors, such as the airlines, have been keen adopters of technologies, using it to help to manage and streamline their operations and to gain strategic advantage. Others, in particular the hotel sector, have been less enthusiastic, but are gradually waking up to the benefits which electronic distribution can bring.[5]

However, given the way in which information and communication technologies is reshaping the basic structure of both commerce and society in general, and consumers' increased demand for information, its importance for the success of a tourism enterprise can only grow in the future. As a result, tourism enterprises need to understand, incorporate and utilize information and communication technologies strategically to serve their target markets, improve their efficiency, maximize profitability, enhance services and maintain long-term profitability.

THE ROLE OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN TOURISM

To analyse the role of information and communication technologies in helping the tourism industry confronted to these changes in the economy react, we adopted a framework, illustrated as follows. The first dimension of this framework is the type of actors or partners an enterprise deals with. We distinguish the following actors:

- Business: the other businesses or enterprises making transactions with the enterprise. This issue deals with business-to-business trade;
- Consumer: the final customer or consumer buying the products or the services of the enterprise. This point mainly addresses the retail commerce;
- State: the public authorities which often are partners in the trade or commerce processes. This aspect mainly refers to the role of public authorities.[6]

We cross this dimension with a second one which is a 3-step maturity model. This model suggests three kinds of generic activities in trade and commerce which can be supported and improved by information and communication technologies:

- Boundary: an enterprise can use information and communication technologies to improve its information gathering capability and better interact with its environment by getting and sending

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[4] Maiorescu et al. 2016.
[5] Nigar 2019.
[6] Nigar 2019.

information outside its boundaries (to target some new trade opportunities more quickly, for example);

- Relation: an enterprise can use information and communication technologies to support and improve its cooperative relations when making transactions with its partners (i.e. supplier, customer, consumer, value-added provider, third-parties);

- Market: a group of companies (competitors, buyers and sellers) can use technologies to improve their global efficiency or competitiveness when reaching their markets.[7]

Business-to-business trade. The traditional view of the enterprise with clear boundaries, limited relations with partners and stable markets is evolving. Today information and communication technologies can leverage a redesign of the interorganizational relations allowing the enterprises to (a) get better at gathering information about their out-of-boundary environment, and (b) share electronic platforms and markets with their competitors

Reaching the consumers. Firms communicate with their customers through various media. For several years, the information and communication technologies have been deeply altering the traditional view of marketing, shopping and retailing media. The computer-mediated environments and particularly the Internet allow *another* way of reaching consumers and online marketers plan to increase their online spending in order to be (a) better at communicating with their customers, (b) more efficient in their selling relations with their customers, and (c) more attractive on their consumer markets, especially the new electronic or information mall. An information mall could be considered an on-line place where a number of online Buyers and sellers can easily congregate and where commerce can be centred.

The role of the public sector. In most countries, governments clearly play a significant role in electronic commerce and electronic markets as they did for previous infrastructure developments (such as railroad, aviation and highways). In its various roles as regulator, educator and promoter, government and public administrations can use information and communication technologies to establish the rules and the incentive structure that will help determine private sector choices. The public sector has many incentives to promote and sustain electronic market solutions for its own rationalization but also to help the enterprises leverage the best of these new technologies in the global information-based society. The public authorities can use information and communication technologies to (a) widely dispatch information collected and structured to help their local businesses reach new markets, and (b) create and sustain electronic platforms and markets.[8]

A TRAVEL MALL FOR INDIVIDUAL CUSTOMERS AND LEISURE TRAVEL

A traveller who would decide to use the Internet today to help prepare a trip to some holiday location would find many sources of information. The World-Wide-Web is a support to multiple servers describing the offerings of countries, tourist regions and travel suppliers (airlines, cruise lines, hotels, rental car companies, etc.) Nevertheless, accessing this information requires knowledge (to know where the servers are located), time (to access each server independently) and perseverance (each server presents information in a different form, through different search mechanisms and with different levels of detail). It is often not possible to book travel directly on-line and certainly not possible to buy the separate parts of a trip through the same supplier (e.g. airline and hotel).

What is needed to facilitate the "shopping experience" of these customers, and ultimately to allow the take-off of this new form of retailing, is the creation of integrated travel malls. These would be virtual collections of shops selling travel-related products, through a common virtual space, and employing similar mechanisms to search through information, present, order and deliver it. We envision a customer coming into the mall and first being asked the way he wants to shop: through specific queries, because he knows what he looks for, or through assisted search, as he is looking for creative ideas to spend his free time.[9]

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7 Lee et al. 2021.
8 Lee et al. 2021.
9 Patwary et al. 2020.

The first way of browsing would allow the customer to specify his destination, the way he wants to go there (e.g. by air (maybe specifying a carrier), by car, etc), what he wants to do there (hotel only, sports activities, local excursions, etc). The second way would have the customer to express general interests and some demographic information. In both cases, based on the provided information, the system would then propose various destinations (through multimedia illustrations) with options and allow people to book their travel.

One might envision a trip to be constituted of specific modules (plane trip, rental car, stay at a hotel, sightseeing excursion, etc.) which would be combined together. The system would make sure there is no discrepancy between the selected modules (e.g. car rental at a different place than the arrival of the plane, missing hotel night, etc.) It could also proactively propose modules, based on the ones already selected.

The whole system should be customized for a specific customer. Based on a customer's profile, which is created from demographic information the customer enters, but also from his past purchases, the system gets to know the customer's preferences and to propose him suitable alternatives. For instance, some customers prefer non-smoking hotel rooms, travel with a limited budget, try to maximize their frequent flyers miles on a specific airline, etc. The system should enforce these choices, wherever possible. At the same time, this knowledge represents an investment customers make with a particular intermediary, and as such allow this intermediary to build entry barriers for its competition, through higher switching costs for customers.[10]

Nevertheless, the envisioned system should leverage new information and communication technologies' such as the Internet (or other open networks) and opens access systems, such as the World-Wide-Web. Therefore, they would gain maximum exposure and a broad user base. These systems should also offer added-value services to customers, such as information-based services (weather information for your destination, visa requirements, experiences of past travellers through discussions using conferencing systems, etc.) These services are often available today in one form or another but need to be standardized and integrated.

The underlying architecture which needs to be created to support these systems will require common formats for the data and common functions (such as reserving, ordering, paying, etc.). This will probably be achieved through industry standardization efforts, under the lead of a Global Distribution System or a consortium of travel agencies. Such systems are certainly a way for travel agencies targeted at leisure travellers to redefine their role in the upcoming information world, and regain leadership they're currently losing to Global Distribution System and direct travel suppliers sales. In our opinion, the added value customers would gain from such services would be sufficient to have them switch from their current distribution habits, and come back again and again, even more so as these systems progressively learn about their habits and preferences.[11]

THE ROLE OF INFORMATION AND COMMUNICATION TECHNOLOGIES AND E-BUSINESS IN THE TOURISM SUB-SECTORS

Accommodation. While the highly evolved framework of the big hotel chains has progressively introduced computer technologies on a massive scale both in the back office (administration and accounting) and, especially, in the front office (marketing, Internet promotions and advertising, inclusion in Global Distribution Systems databases, construction of marketing databases for CRM), other forms of accommodation have not yet made this "quality leap" in use of information and communication technologies. The decision whether or not to invest in such technologies often depends on the degree of awareness of the owner/manager.

New technologies offer smaller businesses significant opportunities, especially if we take into account that many of the limitations of businesses of this type in accommodation and other tourism business areas (characterized by the duality of small/large businesses, such as lack of sensitivity, lack of business know-how, lack of financial resources), could be overcome by the adoption of co-operative strategies permitting a number of businesses to work together on a joint e-commerce and/or online promotion project, thus

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[10]   Patwary et al. 2020.
[11]   Lee et al. 2021.

achieving more economies of scale. A number of new distributors such as worldres.com and hotels.com have emerged offering very cheap rates but at the same time putting pressure on the hotels' yields.[12]

Amusement activities. In this sub-sector, too, new businesses have been born due to the Internet, joining the market to operate exclusively as online commercial intermediaries for the administration of ticketing services for a large number of activities ranging from theatre productions to sports events, museums, and concert halls. These new forms of e-commerce have gradually expanded their presence on the Internet with increasingly complete and integrated sites offering characteristics which are better equipped than they were in the past to:

- make sites easier to use, especially in terms of structure (graphics, ease of browsing, architecture of information) and functioning (internal search engines, cookies, site map);

- be "customer-focused" and therefore capable of supplying information on customers' rights; the presence of customer service activities (call centres, e-mail addresses to which customers may send complaints and communications, information centres), and brand communication (product information sheets, discounts, promotional offers) is particularly useful in this regard;

- attract potential customers and gain their loyalty through games, online publications, chat rooms and discussion groups through which promotional offers, loyalty points, and newsletters may be offered;

- handle orders, payments and delivery: including all functions involved in e-commerce, breaking down the entire process of online purchasing into stages, from order to payment, delivery and post-sales services.[13]

Scheduled air transport. The airlines were without a doubt Europe's first major users of the new information technologies, first "turning" their booking systems, rates, schedules, destinations, etc. into Computer Reservation Systems/ Global Distribution Systems and then using the Internet as a sale and marketing tool and for relations with end users. The Internet is helping to shift pricing and information relationships between airlines and consumers in ways that are benefiting both parties. Specialized search functions offer powerful new tools to shop for the best deal and remove some of the information and pricing advantages that airlines once held over consumers.

More recent developments in information and communication technologies enable airlines to track sales for each service very efficiently and design pricing formulas that will maximize revenues, based on yield management or price discrimination. Based on previous seat sale patterns and predictions of how many more seats will be sold at a given price, the computer adjusts fares constantly as sales proceed. Technically speaking, yield management is designed to convert consumer surplus into producers' surplus. Today's computer reservation systems, at least in some airlines, are so sophisticated that very few seats are sold at the same price and load factors are increasing.

Air travel currently comprises by far the largest volume of online sales with over 60% of the transaction volume (see Fig. 2). This is due to the relatively low product complexity of air travel products. Customers need only minimal information about flights, e.g., time of departure and arrival. Hence, customers are enabled to find all necessary data about their flight without the help of an intermediary and to carry out the booking process on their own. An extreme form of disintermediation is practised by no-frills airlines. By operating exclusively through the Internet and call-centres, traditional brick-and-mortar offices are being reduced to a very small number and travel agencies are circumvented. In contrast, complex travel products such as lodging or the choice of holiday resorts require much more information. Details about the surrounding area and the property largely influence the buying decision. The more complex a travel product is, the more difficult is it to replace the knowledge and experience of a travel agent online.[14]

Intermediation. The intermediation sub-sector of the tourism industry, that is travel agencies and tour operators, is one of the areas in which the use of information and communication technologies has been

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[12]   Gossling 2021.
[13]   Gossling 2021
[14]   Hughes, Moscardo 2019.

and still is most widespread. The Internet "revolution" has brought profound changes to this sub-sector. Travel agencies and tour operators have sought to strengthen their role by gradually implementing commercial projects on the web: first by attractively presenting offers in showcase sites, then, in more advanced cases, by developing e-commerce sites that permit end users to perform all steps in making a purchase directly online.

However, allowing the customer to purchase online involves a process of disintermediation. This is a challenge for the management of complementary marketing channels (traditional and online channels) and conflict arising within the industry. As for online sales to the final customer, tour operators seem quite reluctant to exploit the web as an additional channel because of potential conflicts with the distribution network, namely the risk of cannibalizing agencies. In several countries, where almost all tour operators have their own website, these share the characteristic of not offering online sales, but putting off signature of a travel agreement to a visit to a travel agent, because the tour operators themselves realize that there is evidently a risk of penalization by the travel agencies and of conflict situations arising.[15]

THE ROLE OF ICT IN ROMANIAN TOURISM INDUSTRY

The research methodology included the following stages:

A. *Study objectives definition*. In this stage were clarified the objectives of the research and the working hypotheses. The objectives of the pilot study were:
- identifying the role of information technologies in the tourism industry;
- identifying the level of information technologies in the tourism in Romania;
- propose measures for implementing information technologies in tourism in Romania.
B. *The study sample establishing*. As a pilot study, the sample was drawn from a relatively small number of subjects representative of the target population using information and communication technology in tourism. The pilot study has been realized in guest houses, hotels, restaurants, tourism organizations, and travel agents across Romania. A total of 110 subjects were interviewed.
C. *Data collection*. In this stage, data collection was carried out through a questionnaire distributed online or offline.
D. *Data analysis*. The collected data were processed employing statistical methods so that relevant information can be obtained about the use of information and communication technology in tourism.
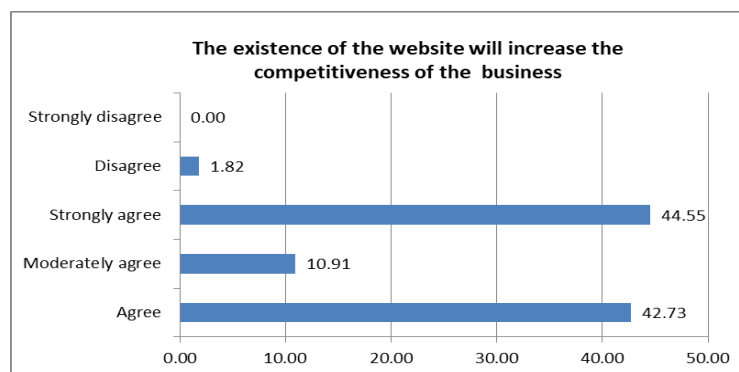

Fig. 1

At the first question, 98.18 % of the respondents agree that the website has an important role in increasing the competitiveness of the business potential. Only 1.82% of the respondents disagree with this statement.

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[15] Gossling 2021.

Social media (Facebook, Instagram) represent a tool for the online promotion

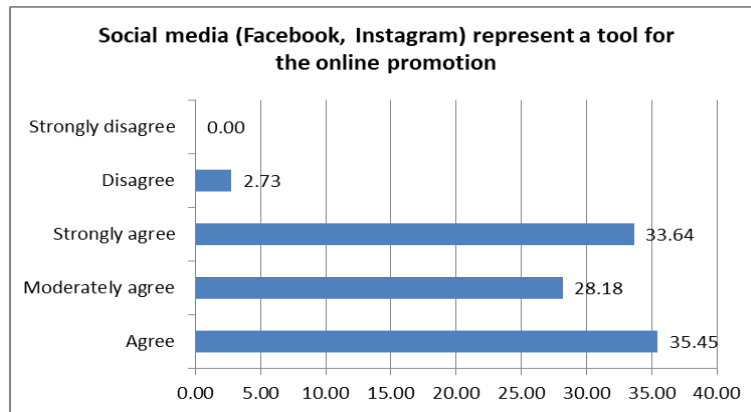|	
Strongly disagree	0.00
Disagree	2.73
Strongly agree	33.64
Moderately agree	28.18
Agree	35.45

Fig. 2

To the second question, regarding the use of social media in online promotion, 97.27% of the respondents agree that social media represents an effective tool for business online promotion and marketing. Only 2.73% of the respondents disagree.

Online promotion has equal role with the TV, newspapers and radio

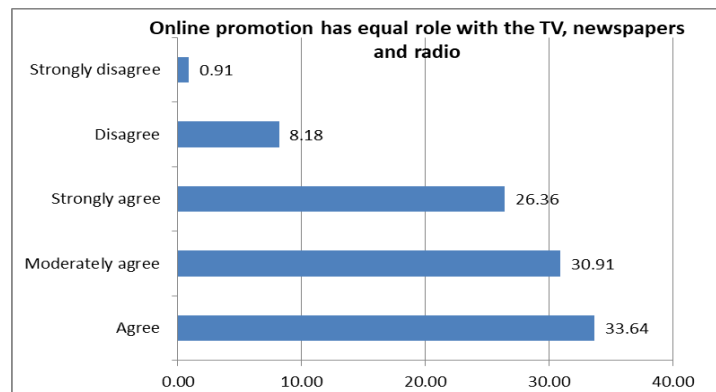|	
Strongly disagree	0.91
Disagree	8.18
Strongly agree	26.36
Moderately agree	30.91
Agree	33.64

Fig. 3

Regarding the position of online promotion compared to traditional promotion (TV, radio, specialized magazines, newspapers, etc.) 90.91% of respondents agree that the Internet has an equal role with TV, newspapers and radio. Only 9.09% of the respondents disagree.

The position on Google search plays an important role in online promotion

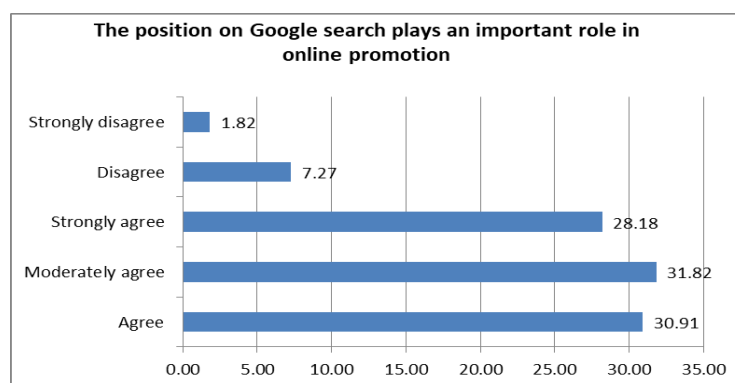|	
Strongly disagree	1.82
Disagree	7.27
Strongly agree	28.18
Moderately agree	31.82
Agree	30.91

Fig. 4

Google is the most popular search engine in the world. According to various estimates 80-90% of Internet users use this search engine. For this reason, approximately 90% of respondents consider that the site's position in Google searches plays an important role in online promotion, and only 10% of respondents agree with this fact.

Online reservation system is essential to sell touristic products and services

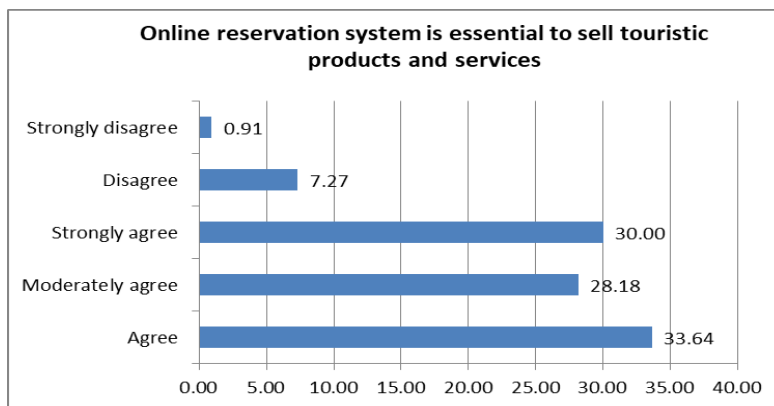|	
Strongly disagree	0.91
Disagree	7.27
Strongly agree	30.00
Moderately agree	28.18
Agree	33.64

Fig. 5

Global reservation systems play a decisive role in tourism because it establishes direct contacts between the tourist services producers and their consumers. Connecting to these reservation systems makes the activity of tourism companies much more productive, with increased possibilities of forming tourist packages according to the most refined wishes of the customers. As a consequence, over 90% of the respondents consider that the online reservation system is essential in the sale of tourist products.

Mobile commerce plays an important role in tourism industry

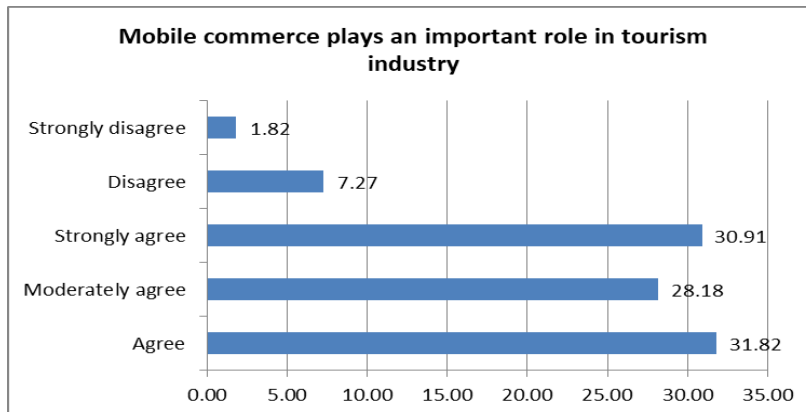|	
Strongly disagree	1.82
Disagree	7.27
Strongly agree	30.91
Moderately agree	28.18
Agree	31.82

Fig. 6

Electronic commerce in the field of tourist industry increases the number of customers, reduces costs and enhances competitiveness. This fact is also reflected in the opinion of over 90% of respondents who consider that mobile commerce plays an important role in the tourism industry.

Websites may reduce the tourism intermediaries

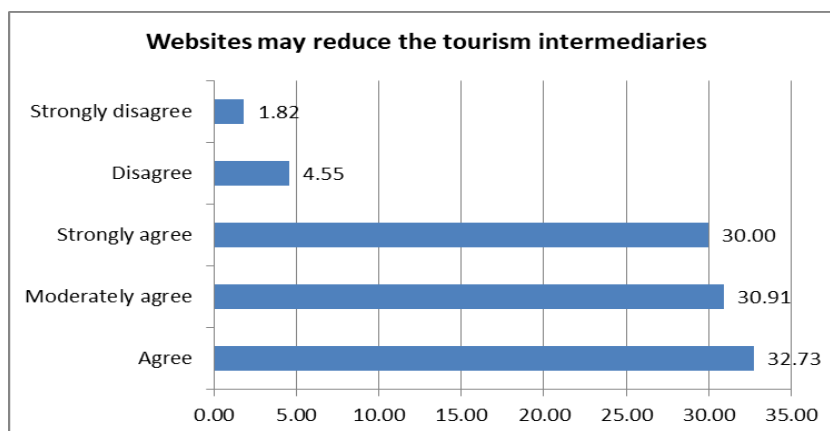|	
Strongly disagree	1.82
Disagree	4.55
Strongly agree	30.00
Moderately agree	30.91
Agree	32.73

Fig. 7

The main advantage of direct distribution can be financial. The payment of intermediaries can represent between 8% and 25% of the selling price of the tourist product, hence the intention of certain tourist

companies suppresses any intermediary. For this reason, 93.64% of the respondents consider that having a website can reduce the number of intermediaries.
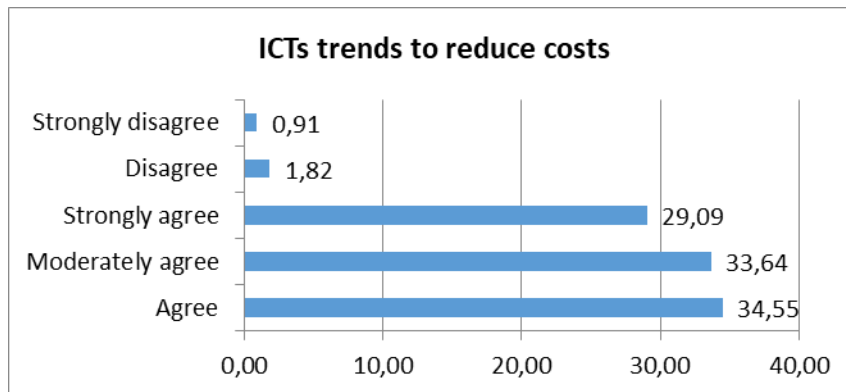

Fig. 8

Considering the answers to the previous questions, it is not surprising that approximately 98% of respondents consider that information and communication technologies contribute to cost reduction.

CONCLUSION

The Internet has become the new medium for interactions which were previously carried out through different means; it has allowed direct interaction between customers and suppliers; it is impacting the role of traditional intermediaries; it has favoured the entry of new e-intermediaries. Information and communication technologies and especially The Internet have given birth to new players in the sector. Besides online agencies, new intermediaries such as travel portals and regional and local tourist portals play quite an important role.

Travel portals offer tourist products which can be quite complex and require know-how and bargaining power. The e-intermediaries have reached a state of certain maturity with mergers taking place, e.g., lastminute.com bought holidayautos.com. In the future, other intermediaries such as Global Distribution Systems and tour operators will have to justify their value added.

The Internet has become the new medium for interactions that were previously carried out through different means. For example, hotels and their customers may communicate via e-mail or web-based forms supplementing or replacing communication on the phone or by fax. The Internet has also allowed direct interaction between customers and suppliers, e.g. between travellers and tour operators, and it is thus impacting on the role of traditional intermediaries leading to dis-intermediation.

As a conclusion, it can be mentioned that in the future there will be three critical success factors, which should be kept in mind while designing tourism systems:

- *Integration*: each of the systems should be as integrated as possible and should represent a "one-stop" shopping experience. This will require standardization among the different suppliers, in terms of data, functions and organizational procedures.

- *Customization*: a travel mall should not simply be a list of possible travel products; it should take advantage of technologies to map as closely as possible the interests of the customer. As such, it should track each customer's profile, and present only the most relevant information. Each customer's interaction with the system should be used to increase the relevance of the relation

- *Pro-activity*: instead of simply waiting for customers to "drop-in", these systems should strive to create travel needs. For instance, by presenting information on attractive sports, customers could be enticed to buy a sports travel package, or by making available information relevant to professionals, they would be attracted by conferences in similar fields. Electronic mail could also be used to regularly update customers on specific offers, close to their tastes or previous purchases.

Romania has a valuable potential, which, properly capitalized, could transform the country into a very competitive, capable of reaching the high standards of the European tourism market. Focusing on the Romanian potential to attract more tourists does not only refer to focusing on our natural heritage, but also to adopting the latest information and communication technologies.

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