

## E-Tourism: The role of ICT in tourism industry

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### Abstract

One of the major limitations of all of the information distribution channels in tourism industry is that they, for the most part, all ultimately flow through the GDSs. Of course, this has several implications in terms of cost, audience and information content. As a result, many tourism suppliers would like to bypass the GDS route and use electronic distribution to sell directly to the consumer. With the phenomenal growth in the use of the Internet and the World Wide Web both in the home and in the workplace, and the opportunities presented by falling hardware and communications costs, the potential now exists for tourism suppliers to both distribute information to and process reservations from customers directly. In his paper by considering some of the trends shaping modern business strategies such as the mass customization of services, the interactive design of products with customers, the service envelope around the most basic products and the increasing information intensity of products, we illustrated how such trends apply to the tourism industry and describes the way ICT can support or enable such strategies. Then, we analysed the role of ICT in tourism industry by introducing a framework to classify and analyze related organisations around three dimensions, distinguishing what happens (1) at the boundary of the firms, (2) in their relations with their customers and suppliers and (3) on the markets they reach. The actors that we primarily considered were the following: (1) the service providers (hotels, airlines, congress organizers, etc.), the travel agencies, and other intermediaries, (2) the final customers (both corporate and individual), and (3) the countries (often represented by their tourism offices). Finally,

we described some innovative ways of using ICT, among others, to expand an actor's business.

**Keywords:** E-Tourism, ICT, GDS

### 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.

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

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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- in order 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, transportation modes, time and lodging accommodation 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

Travellers can acquire information from a wide variety of sources, including directly from the tourism supplier. However (perhaps because of the time pressure mentioned earlier), many choose to use the services of an intermediary. These take different forms. The travel agent acts as both a search-and-book service and as an advisor for the customer, relieving them of much of the burden of searching for suitable products, and also using their knowledge and experience to help match customers with travel experiences. Tour operators act as consolidators, packaging different travel components together and marketing them as a single seamless product. Some government tourism organizations also act as intermediaries, distributing information and brochures for tourism suppliers in their region. The primary role of each of these intermediaries is to facilitate the purchasing process, and information exchange is key to this function. As such, tourism suppliers must provide each one of these intermediaries with information in an appropriate format to assist them in the sales process (O'Connor, 1999).

Tourism suppliers have traditionally provid-

ed this information in the form of print-based media such as brochures or flyers, and through listings published in local or regional guides. However, developing and distributing such promotional material is costly, time-consuming and labour-intensive. In addition, such information is static, while much of the data needed to make a booking (such as, for example, availability and rates) changes frequently, particularly as the reservation date approaches. As a result, consumers usually have to contact the supplier directly to ensure that the product is available and to confirm the rate at which it will be sold. Again, access to timely and accurate information is important at this stage. Tourism products are volatile in that if they are not sold, they represent lost revenue. Therefore, as their 'use by date' approaches, information about them tends to change frequently as suppliers manipulate their price in an attempt to ensure that they are all sold. Current rates must therefore be made available to both intermediaries and direct buyers. Information also has to be able to flow in the opposite direction as, in order to make a booking, the customer's contact and payment details have to be communicated to the appropriate tourism suppliers, and thus an effective and efficient method of communication is needed.

### *The Role of Information and Communication Technology (ICT)*

Development of Information and Communication Technologies (ICT) has transformed the contemporary business environment. It has led to new information economy which is digital in nature. ICT is a broad terminology referring to multiple communication technologies which range from simple and complex namely Cell Phone applications (SMS), Digital Cameras, Internet, Wireless (WiFi and WiMAN), VOIP, GPS, GIS, Convergence (data, voice, media), Digital radio, These technologies are creating a new global market place, which is more competitive. With e-commerce and e business the market has more opportunities and possibilities than ever before. The ability to reach a global audience, obtain instant market information and conduct electronic business transactions has increased economic efficiency and has opened markets for goods and services from the developing world.

E-commerce is expected to benefit economic development in several ways:

1. Through allowing local business access to global markets

2. By providing new opportunities to export a wider range of goods and services

3. By improving the internal efficiency with in the firms.

First, e-commerce allows business to reach a global audience. In Africa, for example, the tourism and handicrafts industries are realizing their ability to deliver their product information directly to consumers. Tourist lodges, hotels, and governments across the continent now maintain sophisticated websites advertising their unique features, handling booking order, and promoting specials to interested consumers. Similarly, small manufacturers of traditional handicrafts are discovering how ICTs can assist the marketing and distribution of their wares. Secondly opportunities created by e-commerce and its predecessor technologies is that ICTs can create digital market places to manage supply chains and automate transaction, increasing efficiency and opening previously closed markets to firms in developing countries. Thirdly, e-commerce is improving the culture of business. There are now better intra-firm communications, cost savings procedures, and reductions in the inventory costs leading to better management. Thus ICTs are the backbone of the capital accumulation. They are connected with new business opportunities, increased trade and investment although they are risks involved sometimes. It suggests a positive relationship between ICT development and economic growth. Indeed an often cited achievements of Indian economy during the last decade has been the emergence of an ICT sector which has shown remarkably vibrancy in terms of output and export growth. However, the contribution of ICT to an economy can be viewed at two different levels. They are contribution on account on ICT growth and contribution on account of ICT diffusion. While the former refers to the contribution in output, employment, export earning etc on account of the production of ICT related goods and services, the later refers to ICT induced development through enhanced productivity, competitiveness, growth and human welfare on account of the diffusion of this technology to the different sectors of the economy and society. (Karmer and Derick, 1992).

### *Nexus between ICT and Tourism: A Review*

Recent Studies on ICT and tourism has revealed the transition in the industry as a result of ICT impact and have explored its possibility and potential. Poon (1993) analyses some of the major challenges

facing tourism industry and outlines the nexus between tourism and ICT. He traces the rapid shift-taking place between 'traditional tourism sector' and 'new tourism industry'. Technology has a strategic role in reshaping the value chain in the industry and in the process, consumers are gradually adapting to the new values, lifestyles and new tourism products, which has re-engineered by the new technologies. Although some of the technologies described are now obsolete, the implicit message is relevant and gives an overall review of the changing face of the tourism industry. Inkpen (1998) and Sheldon (1997) have examined the main characteristics of the industry structure and the operation of the new technologies in it. ICT applications in different sectors like airlines, hotels, tour operators, road and rail transport etc is dealt in detail with informative case studies. Some of the world's largest GDS (Global Distribution System) namely Sabre, Galileo, Amadeus and Worldspan are examined. Besides analyzing the telecommunication technologies in the industry, the hospitality sector, entertainment sector, transport sector, management sector and other intermediaries have been diligently explored. Werthner (1999) provides a more detailed and logical understating of the industry's structure by focusing on the concepts, definitions, consumer behavior, economic aspect, market transactions, etc.

Information Technology ( hardware & software developments), information management, intelligent applications and system integration etc are examined carefully. Additional information on business strategy exploring the relationship between ICT, strategy and organization is also articulated. Buhalis (2003) also stressed on strategic management in his book providing a comprehensive overview of both operational and strategic management. Buhalis and Laws (2001) deals with the theory, practice and issues related to tourism distribution. The distribution strategies and approaches from a destination point of view is explored and discusses the possible future research in tourism distribution channels. It needs to be noted that the distributional structures are mainly from Europe, UK and other western nations and hence may or may not be useful for developing country's strategies. Connor's (1999) work serves as a textbook on electronic distribution with its logical explanation and case studies. GDS, CRS and DMS are analyzed with example of cases from across the western world. The growing phenomenon of travel distribution through Internet and its impact on distribution channels

structure and functionality is explored with rigor. Carter & Bedard (2001) and Carter & Richer (1999) have focused on the operators in the tourism industry. Developments of the e-commerce and DMO (Development Management Organizations) and their changing value chains are analyzed intelligently and clearly so that importance of internet presence for consumers, intermediaries, travel media and other players in the industry is noted and understood through their works. Marcussen (1999) attempts to provide an overview of innovative developments in distribution of travel and tourism services in Europe. It documents the wealth of statistical data on travel and related transactions in the European tourism industry. However, most of the experiences are based on the western developed world, which could possibly be a limitation while trying to understand the nexus of ICT and Tourism in an Indian context. Jennifer et al (2003) have examined the way ICT and Internet have gradually changed the tourism industry in China. They have used the existing theoretical framework on ICT and e-tourism developments in other parts of the world namely Europe and America to examine their impact of ICT application in the tourism industry contemporary China. There have been tremendous developments at the destinations levels in the recent years. Internet, Intranet etc have been extensively employed by the (DMOs) which has integrated the functioning process and made the system more efficient. Studies like (Poon 1993, Sheldon 1997, Werthner & Klein 1999, Alford 2000, Werthner and Klein 1999, Alford 2000, WTO, 2001) have revealed that Internet and strategic implementation of IT is now critical for companies to survive in the global economy. However, not many efforts are made to study e-tourism developments in India and other developing countries.

### *Analysing the role of ICT in E-Tourism*

In order to analyze the role of ICT 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. 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 ICT:

- **Boundary:** an enterprise can use ICTs to improve its information gathering capability and better interact with its environment by getting and sending information outside its boundaries (in order to target some new trade opportunities more quickly, for example)

- **Relation:** an enterprise can use ICTs 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.

### *Business-to-business trade*

The traditional view of the enterprise with clear boundaries, limited relations with partners and stable markets is evolving. Today ICT can leverage a re-design 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 (Bloch & Pigneur, 1995).

### *Reaching the consumers*

Firms communicate with their customers through various media. For several years, the ICTs have been deeply altering the traditional view of marketing, shopping and retailing media.

The computer-mediated environments such as the Minitel, CompuServe, 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 as an on-line place where a large number of on-line buyers and sellers can easily congregate and where commerce can be centered (Inkpen, 1994).

### *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 ICT to establish the rules and the incentive structure that will help determine private sector choices (Konsynski, 1995).

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 ICT in order 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.

### *Innovative applications of ICT*

On the basis of the previous discussions, our goal in this section is to describe three innovative applications of ICT for the tourism industry. These applications target three large segments of the industry: corporate customers and business travel, individual customers and leisure travel, as well as groups of people traveling to congresses and exhibitions. They leverage extended enterprise technologies to improve the level of service offered to customers and the competitiveness of the actors selecting them.

#### *A business travel process management application for corporate customers*

Most companies around the world look critically at their business travel management processes. The goal is double: to use process redesign methodologies to streamline these processes and lower their cost (sometimes, processing an airline ticket request or a cash advance costs more than 50\$) on one side, and leverage technology, enforce policies and start collecting consolidated data on travel management in order to negotiate future discounts with suppliers on the other side (McKenna, 1996).

We anticipate to shortly see integrated travel management applications emerge, leveraging workflow technologies and connections to open networks. The workflow system would be used internally to circulate travel requests and expense reports around the company, collecting the required autho-

rizations and feeding automated statistics collecting systems. The system would allow for the general specification of the required trip (time, place and specific constraints). Connections to external partners would be used to send completed requests to a travel agency. Based on each traveler's profile and on the company's policy, the agency would then fill in the details (specific place, rental car type and company, etc.) and pass the actual reservations and orders.

It is obvious that with the development of such automated systems, intermediaries such as travel agencies will find their added value increasingly harder to justify. With the increasing intelligence of travel systems, they will be able to contact the suppliers systems directly and book segments without needing a travel agency. Printing the tickets will not be necessary anymore as the trend towards ticketless travel expands. The supplier's system will return confirmation numbers that will be used to print a trip confirmation on any printer. Such automation will be driven by the trend towards the reduction of distribution costs: it is currently the third cost in order of importance for airline companies, and the most easily targeted. The current commission cap in the United States is a proof of that trend.

The expense reporting part will also be automated through the same facilities. The credit card institutions will increasingly deliver their credit charge data through automated delivery channels, and the downloaded charge data will form the basis for the fulfillment of an expense report. The travel management system will complete it, and include recurrent charges (such as the private car trip to the airport and parking) before triggering the workflow system to circulate the expense report for approval. Once approved, a link with the internal accounting system will make sure the credit card company or the traveler is reimbursed.

#### *A travel mall for individual customers and leisure travel*

A traveler 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 serv-

er 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 in the mall and first being asked for the way he wants to shop: through specific queries, because he knows what he looks for, or through assisted search, as he’s looking for creative ideas to spend his free time.

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 in-

termediary to build entry barriers for its competition, through higher switching costs for customers. This system is similar to what is currently known as a Computer Reservation System (CRS, now often called a Global Distribution System (GDS).

Nevertheless, the envisioned system should leverage new ICTs such as the Internet (or other open networks) and open 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 travelers 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 need 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 GDS or a consortium of travel agencies. Such systems are certainly a way for travel agencies targeted at leisure travelers to redefine their role in the upcoming information world, and regain leadership they’re currently losing to GDS 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 (Steiner, 1994).

### *An integrated travel environment for congress organizers*

The last of our descriptions of the use of technology to improve travel distribution practices is targeted to the organizers of exhibitions and congresses. The context we use for our example is a conference with multiple breakout sessions running in parallel, and a large exhibition with various companies presenting their products.

Planning to go to these events includes two components: buying travel products and planning the conference itself. We envision a travel mall modeled around the first system described. Any participant will find there descriptions of the different ways to join the congress city, the different accommodation available there and the various leisure activities possible. On-line presentation and ordering will be possible.

In addition to that, the various sessions the participant can attend will be listed, and the system will assist the customer in choosing the sessions which better match its interests. On top of that, a map of the exhibition will be available. Upon selection of the most interesting places to visit, the system will print out a customized map of the best route to see everybody in a minimum time.

Such a system should help enhance the preparation of the trip and maximize the added value for the participant. It will also help the organizer streamline its customer relation service, and help differentiate it from the competition. On a macro-economic level, it would reinforce the position of a city or a region on the global marketplace. As such, and following our introductory remarks, it could be an area where local government action would be favorable (Schmid, 1994).

## Conclusions

A profession, no less than a craft, is shaped by its tools. The profession of marketing, its theories, its practices, and even the basic sciences that it draws on are determined by the tools at its disposal at any moment. When the tools change, the discipline adjusts, sometimes quite profoundly and usually quite belatedly. The introduction of television advertising 50 years ago was just such a disruptive event and marketing theory and practice are still responding, evolving their understanding of how the tool works and how its effects should be measured (Deighton, 1996).

However, marketers working in the tourism sector need to be aware of electronic evolution. The speed of development of new distribution channels and the lack of a comprehensive source of information about the features of these systems means that the tourism industry is currently in a reactive rather than a proactive position.

This paper represents a step forward in classifying the various types of inter-organisation systems typical of IT-enabled extended enterprises and suggests some visions for future offerings. In fact, there will be three critical success factors, which should be kept in mind while designing these 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 organisational procedures.

- Customization: a travel mall should not simply be a list of possible travel products; it should take advantage of technology 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

## References

- Bloch, M. & Pigneur, Y. (1995). *The extended enterprise, a descriptive framework, some enabling technologies and case studies in the Lotus Notes environment*, Ecole des HEC, Université de Lausanne, M-94.
- Buhalis, D. (1998). Strategic use of information technology in the tourism industry. *Tourism Management*, 19 (5), 409-421.
- Deighton J. (1996). The future of interactive marketing. *Harvard business review*, Nov-Dec, pp.151-162.
- Gupta, S & Bansal, S.P. (2001). *Tourism Towards 21st Century, Deep and Deep*. New Delhi.
- Inkpen, G. (1994). *Information Technology for Travel and Tourism*, Pitman.
- Inkpen, G. (1998). *Information Technology for Travel and Tourism*, Addison Wesley Logman, Essex UK .
- Jennifer, X. M, Dimitrios, B & Haiyan, S. (2003). *Information Journal of Information Management*. 23(6),451-467.
- Konsynski, B.R. (1993). Strategic control in the extended enterprise, *IBM Systems Journal*, 32(1), 11-45.
- Kramer, K.L & Derick, J. (2002). Information Technology and Economic Development: Results and Policy Implications of Cross-Country Studies, in Pohjola M. (ed) *Information Technology, Productivity and Economic Growth*, Oxford University Press.
- Marcussen, C. (1999). *Internet Distribution of Eu-*

- ropean Travel and Tourism Services*, Research Centre of Bornholm, Denmark.
- McKenna, R. (1995). *Real-time marketing*, Harvard Business Review.
- O'Connor, P. (1999). *Electronic Information Distribution in Tourism and Hospitality*, CABI Publishing, UK.
- O'Connor, P. (1999). *Electronic Information Distribution in Tourism and Hospitality*. CABI Publishing.
- Poon, A. (1993). *Tourism, Technology and Competitive Strategies*, Cab International.
- Sabado, O. (2005). [www.estig.blogspot.com/2005/10/role-of-ict.html](http://www.estig.blogspot.com/2005/10/role-of-ict.html).
- Schmid, B. (1994). *Electronic Markets in Tourism*, Proceedings of the ENTER'94 Conference, Innsbruck, Austria.
- Sheldon, P. (1997). *Tourism Information Technology*, CA International, Wallingford, UK
- Steiner, T. (1995). *Information technologies and destination management in tourism: a conceptual framework*, Master thesis, Ecole des HEC, Université de Lausanne.
- Werthner, H & Klein, S. (1999). *Information Technology and Tourism – A Challenging Relationship*, Springer, Wien and New York.