



Research Article

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A research on information technology applied to improving performance for tourism enterprises

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ABSTRACT

The information technology has great influence on both the structure of the tourism industry and the strategy of the tourism enterprises in this age of big data. This paper focuses on the problem how information technology can be used to improve the performance of tourism enterprises. Considering the specialty of tourism industry, this paper develops a data-sharing model including internal and external data-sharing center to promote performance by reducing cost, improving service quality and extending market volume etc. Data-sharing is a complicated process including several steps, such as collection, evaluation, selection, classification and integration. These steps form a data mining cycle to provide more resourceful information for the tourism enterprises and its stakeholders, thus the business performance of the enterprises can be improved steadily and continuously. It can be expected that data-sharing model will be extensively applied to many tourism conglomerates in the near future.

Key words: Information technology, performance, data sharing.

INTRODUCTION

The rapid development of information technology as well as its wide application has produced a widespread impact on social and economic life. No industry can avoid participating in the process of "revolution", including tourism industry. Technological progress and tourism have been going hand in hand for years^{[1][2][3]}(Poon,1993;Sheldon, 1997;DimitriosBuhalisa, Rob Law,2007), and the relationship between them is becoming closer. "No player in the tourism industry will be untouched by information technology"^[1](Poon, 1993). Numerous studies have concluded that the emergence of information technology shows a great impact on tourism enterprises, on the structure of the tourism industry and on the tourist demands as well, which has threatened the traditional tourism enterprises but brought new opportunities. Changes in the travel distribution system brought by information technology are the hot research fields. Substantial researches are concerned with the impact of eTourism and the changes of business model. However, how information technology can be used to improve the performance of tourism enterprises has not been concerned enough. Data-sharing model which is now widely used in large International Conglomerate is the product of the business expansion and information technology. This model improves the business performance with the results of cost reduction, market expansion, higher service quality etc. Referring to the core idea of data-sharing model, this paper extends the model incorporating with the specialty of the tourism industry trying to develop a model for tourism enterprise to improve performance in big data age. This paper is organized as the following five parts: Introduction; Literature Reviews; Information Technology and Tourism Enterprises; A Data-sharing Center Model for Tourism Enterprises; Conclusion.

LITERATURE REVIEWS

DimitriosBuhalisa and Maria Cristina Licata(2002) predicted the development trend of the eTourism, on the basis of the development of information technology^[4]. Compared with the traditional enterprises, eTourism provides more added value features, content, availability information and booking functionality, so that traditional enterprises need

changes for survival in an intensely competitive market.

Samira BoroujiHojeghan&AlirezaNazariEsfangareh(2011) proved the digital economy's effect on tourism industry through Internet and Web technologies^[5]. The application of information technology and telecommunications is increasingly crucial for tourism. In recent years, tourism electronic commerce is developing rapidly. They concluded that the two main factors for conducting successful e-commerce are 'security of the e-commerce system' and 'user-friendly Web interface', thus coming to realize that building customer trust and convenience for customers are essential to succeed^[5]. All technologies, web services and applications used in tourism industry aim at facilitating the operations of organizations, helping customers to get the ideal product and service, evaluating the process and stimulating and attracting more demands^[6] (Ali Sukru Cetinkaya,2010).

With the continuous growth of population who regularly surf on the Internet, the World Wide Web (WWW) has become the indispensable channel for people to search for tourism information^[3](Buhalis , Law, 2007).As the web becomes an increasingly popular information source, tourism destination websites can play a critical role in destination choice. UnaiBastida , T.C. Huan(2012) estimated the tourism websites' information quality of the four global destination brands, that is, Beijing, Hong Kong, Shanghai and Taipei. Such analysis is based on websites' quality and its usefulness. This study indicates that Hong Kong's site is the best while Beijing has the most room for improvement^[7].

Nowadays, tourism enterprises have been unable to survive without information technology in China. According to the relevant data released by theNational Tourism Administration of China , the proportion of travel reception of domestic tourists is going down, from 6.73% in 2010 to 5.51% in 2012.Due to the number of website in China which sets up tourism columns has increased fast and service quality has been improved, potential tourists tend to purchase tourism products online. That is to say the way of travel has become more and more diversified. In recent years, the research on tourism information is divided into two categories. One is to discuss the application of information technology in the tourism industry, existing problems and countermeasure; the other is to explore the possibilities and ways of its application in tourism industry, combining with a traditional methods or new information technology tools. Shaoxiaomei(1998) finally chosea tourism development model through the establishment of networks, data mining^[8]. Zengfanta(2002) claimed that application of data mining technology in tourism marketing, would enhance the return on investment(ROI) of management information system^[9]. Wanglu(2004) noted that cyberspace technology could provide technology platform for virtual tourism planning, which is supported by information superhighway, GIS, remote sensing technology and virtual reality technology^[10]. In fact, the application of information technology is starting from the management information system and after years of developing , it has achieved many great results. But it is not limited to this, how to use information technology to improve business performance will become the focus of scholars and entrepreneurs.

At present, some industries have begun to use data-sharing model to improve business performance, e.g. medical system and transport system. In addition, customer data sharing is particularly common. Chen et al.(2001) shows that when firms are symmetric and information is perfectly accurate, no data sharing takes place^[11]. Liu and Serfes(2006) got the similar answer. They suggest information sharing is profitable only if the firms are sufficiently asymmetric in their customer bases^[12]. In contrast, Nicola Jentsch, GezaSapi and Irina Suleymanova(2013) conclude that the sharing of customer data can be profitable even though the firm is symmetric and the analysis reveals that the incentives to share data on customer flexibility are stronger when consumers are relatively homogenous along this dimension^[13].

Data-sharing is the trend of large enterprises, including Tourism Conglomerate. Due to the particularity of tourism industry, data-sharing would bring more benefits, such as cost reduction, more advanced technology, better quality of service and larger market share.If the effective information can be easily picked up in the vast data through fully usage of the established data-sharing center, obviously, it will accelerate the development of tourism enterprises. Data sharing is not an impossible dream any more due to the development of information technology. Therefore, this paper is trying to explain the feasibility of using the data-sharing and how to use data-sharing to enhance the performance of tourism service providers.

INFORMATION TECHNOLOGY AND TOURISM ENTERPRISES INFORMATION TECHNOLOGY AND DATA-SHARING

With the rapid development of network, exchanging information and data is encouraged in tourism. Initially, the tourism information requested is not comprehensive, and the importance of resource sharing and scale effect hasnot been fully realized so that data-sharing is still not concerned enough. And different types of tourism service provider possess different data, which may block the effective exchange of information. Fortunately, advanced in information

technology has this problem resolved. After establishing a unified data exchange standard in tourism information, effective information can be exchanged between tourism service providers. The unified data exchange standard is achieved through XML technology. Nowadays, data-sharing is supported by information technology, and the performance of tourism service providers is needed to be improved urgently (Figure 1).

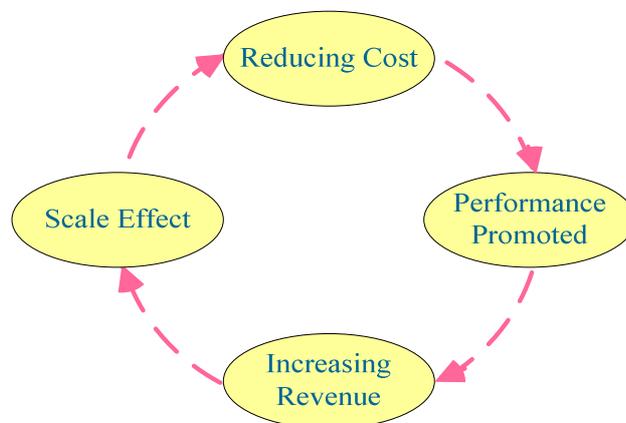


Fig. 1: The general construction of data-sharing

Undoubtedly, internal management costs and transaction costs will be reduced if a proper way can be found to make fully use of data-sharing. With the cost advantage enterprises would like to expand production earning more profits, and the scale effect will in turn reduce cost further. In conclusion, taking advantage of data-sharing would enter a virtuous cycle.

INFORMATION TECHNOLOGY AND TOURISM ENTERPRISES

The difficulty to obtain comprehensive information on destinations created chances for the tourism intermediaries. Tourists mainly rely on travel intermediaries to obtain the information of tourism products before. While, with the advanced in information technology, information sources are more diverse than ever, which have an impact on the tourism supply chain. At present, the definition of tourism supply chain fails to reach an agreement. Here, tourism supply chain is defined as a network of tourism organizations engaged in different activities ranging from the supply of different components of tourism products/services such as flights and accommodation to the distribution and marketing of the final tourism product at a specific tourism destination, and involves a wide range of participants in both the private and public sectors^[14](Xinyan Zhang, Haiyan Song, George Q. Huang, 2007). That is to say information technology has a deep impact on tourism service providers and their relationships. However, relationship between the tourism service providers is founded on the tourists' demand. This suggests that information technology has changed consumer demand and tourism business model.

Changes of consumer demands. Tourists always retrieve information by internal or external search, Beatty and Smith(1987) claimed that people usually attempt to search for information in their memory first and, if an internal information source does not work, they then go out and search for relevant information^[15]. The internal search derives from personal experience and the accumulation of knowledge, which is the key factor when making decision. However, when potential tourists lack holiday experience, external information source is particularly significant. In the beginning, external information source is relatively simple, which includes one's family and friends, media, travel intermediaries and so on. But now, external information source become diverse with the ongoing development of information technology. Apart from travel agents, family members and friends, tourist information sources have been found to be more diverse than ever^[16](Rompf, DiPietro, & Ricci, 2005). It indicates that tourism enterprises, especially travel intermediaries have changed dramatically due to information technology. For tourism businesses, the Internet offers the potential to make information and booking facilities available to great number of tourists at relatively low costs. It also provides a bridge for communication among tourism suppliers, intermediaries, as well as end-consumers^[5] (Samira BoroujiHojeghan&AlirezaNazariEsfangareh, 2011). Potential tourists who unable to get sufficient information, could be able to achieve a large quantity of tourism information from internet. Furthermore, book airline tickets, hotels, and pay of tourism products are seems to be much easier regardless of inconvenience of time or location. Obviously, traditional way to travel has been considered unable to meet the needs of tourists while information technologies provide users a better environment to interact with and could solve their headache. The increasing uncertainties of demand from customers have pushed the tourism enterprises onto a very high level of competition. To survive from, those enterprises have to be more initiative on innovation in order to make them more competitive.

Changes of business model. Tourism e-commerce is the cutting edge software that based on network technology. E-commerce has not only changed the way business was conducted but as a result it also tremendously improved profits of organizations. E-commerce provides rich information for helping tourists to find the ideal products. Apparently, shopping online is at lower cost compared to shopping in the store. Nevertheless, the existing travel websites is not capable to meet the personalized needs due to the limited information and products. In another word, tourism e-commerce has to be updated with information technology in order to be more competitive. eTourism is recommended to be synchronized with the demand simultaneously with data sharing and therefore, more potential tourists could be attracted. Furthermore, by analyzing the data feedback achieved from existing software would be important information on future prediction.

Information technology revolution makes the competition environment changed. Traditional tourism service providers have to change the business structure to remain competitive. Large-scale traditional tourism enterprises have created their own websites, such as CYTS, Spring Tour Network, while small and medium-sized tourism enterprises publish their information through a third party website like Sina, or Elong. In the purpose of expanding the market share, a combination of online and on-site business model is proposed. Compared to the traditional model, new model accelerates the flow of information, which brings convenience to potential tourists. In addition, the new structure will reduce the cost and improve the business performance at the same time.

Nowadays, tourists hope that the related products can be more precise so that they can enjoy the holidays better. Explain in other words, cooperation between the tourism service providers should be gradually close, and the integration of industrial chain is on the way. Tourism enterprises began to provide diversified services. Apparently, the tourism enterprises will go to collectivization in the future. In the past, hotels, scenic spots and tourism intermediaries are cooperating as independent corporates, and they would be more likely to work together as a union group. Hence, business size would be increased, operating cost would be reduced and the efficiency of management and decision-making would be improved as a benefit.

IMPLICATIONS

Generally, data-sharing only exists in enterprise which has vast data, just like large multinational corporations. Due to the limitation of enterprise scale, data-sharing has not been widely used in the tourism business. Internet connection fee, advertisement promotion fee on electronic commerce, training, skill development and human resources provide big challenges for smaller companies. Moreover, Massive funds need to be invested in tourism products innovation, which is unrealistic for smaller tourism enterprises. Tourism business has complicated and extensive industry chain facing all kinds of customers and suppliers, and it has to deal with more data than other businesses. Data sharing is very important in the tourism companies, small and medium tourism enterprises will be dependent on large-scale tourism enterprises, or become partners with other companies to manage the data otherwise it will be weed out this industry.

A DATA-SHARING CENTER MODEL FOR TOURISM ENTERPRISES

Data is becoming a key factor for enterprises to enhance their competitiveness. Brown, Chui, and Manyika (2011) illustrate that companies that use data to support decision making have higher returns on equity than those that do not^[17]. The tourism sector is especially data hungry, for having the right information at the right time provides businesses with knowledge about customers, buying behavior, and market trends^[18] (Cooper, 2005) that can help developers, marketers and operators make the right investment and product decisions^[19] (Carmen Lam, Bob Mc Kercher, 2013).

Although tourism enterprises have been aware of the importance of data, they still have not found a proper way to take advantage of data at present. With the development of economy and information technology, multinational companies have introduced shared services model to improve service quality and efficiency, promote the development of core business, accelerate the standardization process of the enterprise and reduce operational costs. Data-sharing model constructed in this paper is similar to shared service model in some way, but differences are apparent. Shared services model is only used within large enterprise, while data sharing for the tourism enterprises could be both internal and external. Data-sharing refers to the exchange of data among groups, divisions and organizations for the purpose of improving enterprises operating performance by the effective exchange, integration, and synergy of data. It can also be viewed as a combination of interaction, communication, and learning processes that allows enterprises to acquire information from others.

DATA-SHARING MODEL

The data-sharing model (Figure 2) consisting of internal and external ones may contribute to promoting tourism business performance.

Internal data sharing is to share data between the corporation divisions in different regions. A data center is established

to receive data from branches, then feedback after the integration of all data. Therefore, branches can use valid information for developing new products or new technology, in the purpose of expanding markets and improving corporate performance. External data-sharing is to establish a data sharing relationships between the upstream and downstream enterprises in the industry chain. The tourism service providers transmit different types of data to data-sharing center, then it will be translated into useful information by selecting and integrating. Thus, tourism service providers would get original data as well as valuable information.

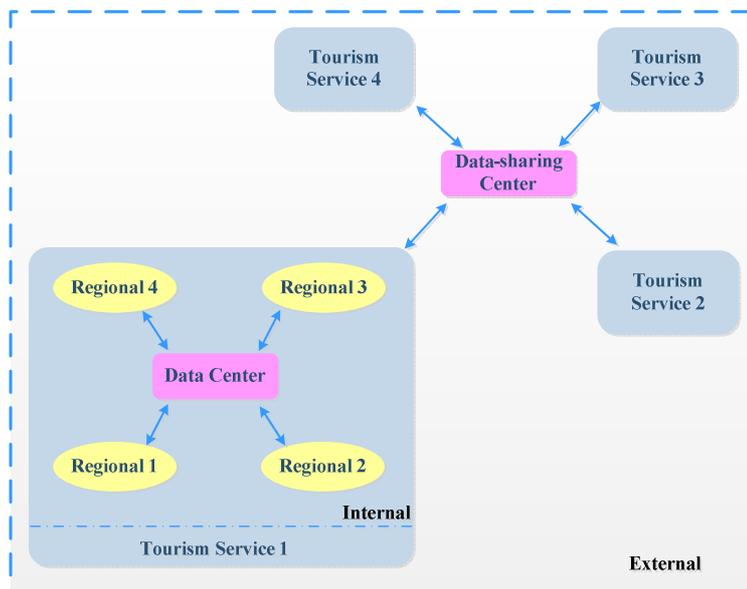


Fig.2:Data-sharing model

Generally, internal data-sharing is just a simple exchange process while external data-sharing is not the same. It is complicated, since different types of data are involved(Figure3).

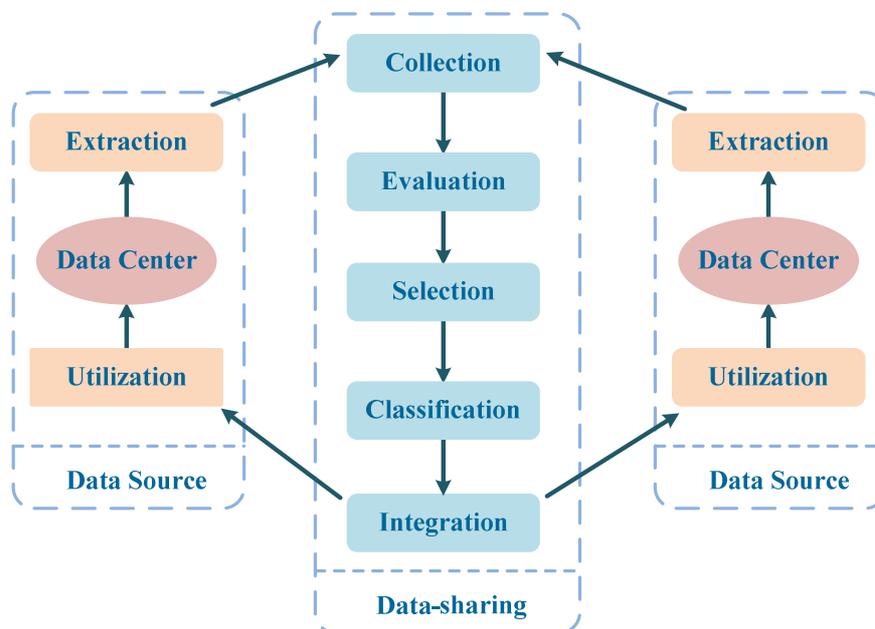


Fig. 3: Data-sharing center---data processing system

Considering each tourism service provider as a data source, data sharing is a cyclic process that data from the data source transfer into the data-sharing center then flows to data sources from the data center. Steps are as follows: first, data sources extract data from inside and transmit it to the data-sharing center; Second, the center will evaluate the received data and select useful data after that. Third, data from different sources need to be classified. Fourth, integrating effective data and transforming into valuable information, meanwhile, feedback the information to the data

source. Fifth, valuable information will be used by data source, which could generate new data. While the new data would be extracted to data-sharing center again, go on and on, a plenty of information could be produced. Hence, data-sharing is a continuous circular loop.

DATA-SHARING MODEL AND TOURISM ENTERPRISES PERFORMANCE

Data-sharing model is used to improve performance by ameliorating organization and interactive network (Figure 4). Tourism enterprise may benefit from data-sharing in many ways. First of all, data center will collect all of data, which help headquarter to know the actual operating status of division. Once understand the advantages and disadvantages of division, headquarters could allocate resource reasonably so that the cost can be controlled effectively. Next, data would reflect division performance. By comparison, divisions with poor performance could learn advanced management experience from the superior ones to increase efficiency. Finally, sharing customer data is conducive to innovation products. With fierce competition in the tourism market, enterprises need innovative tourism products to meet potential tourists' personalized needs. In turn, it will expand market share and remain competitive.

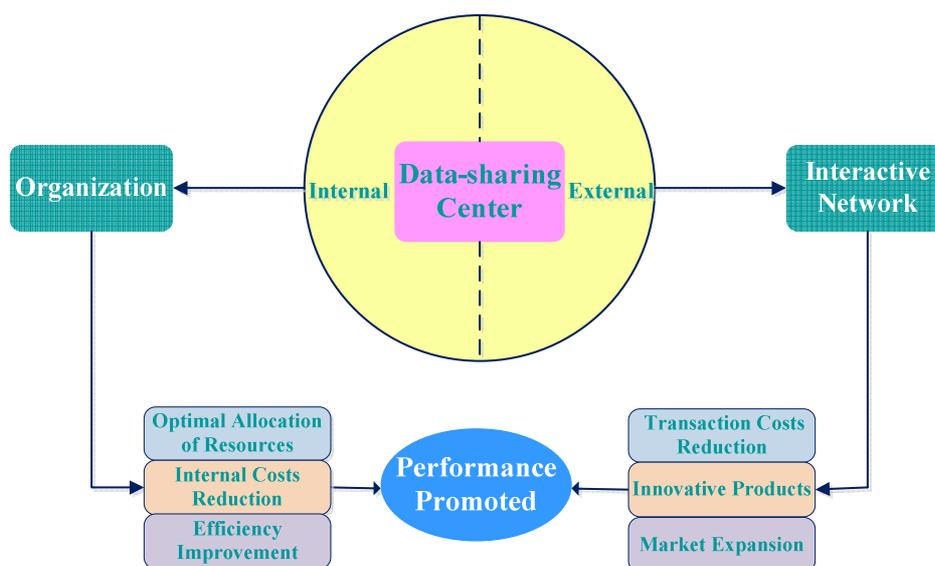


Fig.4: The function mechanism of data-sharing

There is no doubt that internal data-sharing can improve business performance to a certain extent. As a result of the limited data, data-sharing center can't accurately grasp market trends, while external data-sharing can make it up. Hence, the demand of external data-sharing will be generated finally. With the benefits of external data-sharing, the cooperation with other relative tourism service providers may be improved, and then transaction costs are reduced. Moreover, enterprises can absorb outstanding experience and advanced technology of other enterprises to promote their own efficiency. Obviously, it is inevitable that enterprises will improve enterprise performance as long as taking advantage of data-sharing model reasonable.

Data is becoming the core competitiveness of enterprise, and the advantages of data-sharing are becoming clearer. Therefore, in order to gain a foothold in the huge potential of the domestic tourism market, tourism enterprises should make use of data-sharing. Especially in tourism, only when tourism service providers cooperate together, can they provide a memorable travel experience for tourists. For this reason, a single enterprise provides limited service, which is unable to collect comprehensive data. While limited data cannot accurately predict consumer trend, so enterprises could do nothing but share data. All of above, it is a proper way for tourism enterprise to reduce costs, improve service quality and promote performance.

CONCLUSION

This paper is only an attempt to bring together the information technology and the specialty of the tourism industry trying to find a feasible way to improve the performance for tourism enterprises. The findings of this paper illustrates that it is necessary for tourism enterprises to establish data-sharing centers, owing to the strong correlation with stakeholders of the industry chain and the rising variety of customer's demands. The internal data-sharing center is to ensure optimizing resources allocation, the external one is to achieve innovative products and stay at competitive

advantage. With the two centers, the tourism enterprises could not only enhance operational efficiency and reduce cost; but also build a better relationship between suppliers and customers, which will bring more and more market share if operated well.

The amount of related data for the tourism industry will expand rapidly at an unimaginable speed in the future. Therefore, it is actually necessary for tourism enterprises to build data-sharing center to process the data properly. The one which can do a good job of data mining will undoubtedly show good business performance and obtain sustainable development with the development of information technology.

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