Enhancing competitiveness in the tourism industry through the use of business intelligence: a literature review

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Abstract

Purpose – The purpose of this paper is to demonstrate the relevance of business intelligence (BI) in businesses in general and tourism firms in particular. BI has been hailed as an innovation that can propel businesses that adopt the system to high productivity and efficiency. This paper confirms that view but further adds that BI also enhances a business's competitiveness.

Design/methodology/approach – This paper reviews literature on the use of BI in tourism. Although current literature is largely fragmented, focusing on BI, the tourism industry and the notion of competitiveness separately, this paper makes an attempt to bring the three sub-themes in the same study and highlights their interconnectedness. The study adopts two environmental analysis models to better analyze this matter. First is the environmental analysis model as based on Downes's modification of Porter's five forces framework. The second model used is the resource-based view approach to business environmental analysis.

Findings – This paper affirms that the tourism industry is one of those industries that continue to benefit from the advantages that come with the adoption of a BI system. Literature shows that the tourism industry was one of those that first adopted BI in order to benefit from the benefits that come with its adoption. Such advantages include flexible and user friendly tourists' data capture, storage, retrieval, processing and analytical capabilities.

Research limitations/implications – This was a largely literature review-based study. There is, therefore, room for strengthening its findings by conducting field work and mixed methods research for more robust results.

Practical implications – This study will surely benefit the tourism industry and business in general from its highly favorable conclusions to the benefits that come with the adoption of a BI system. It can also be used as a reference in to the tourism field, especially aggregating important concepts and literature that can help future practical studies.

Social implications – Society will also benefit from this study in terms of the new knowledge that has been generated. Members of society will then be in a position to demand products and services that are a result of innovation and informed decision making.

Originality/value – Although this paper is largely based on literature, the conclusions reached are those of the authors. A close assessment of the literature in BI and the tourism industry was done, resulting in the conclusions reached by the authors.

Keywords Efficiency, Business environment, Decision making, Competitive advantage, Business processes, Business data

Paper type Research paper

1. Introduction

Literature on business intelligence (BI) is abound. However, there is no consensus on the definition of BI (Chee *et al*., 2009; Muller and Hart, 2016; Ponelis and Britz, 2012; Wixom and Watson, 2012). Some writers have defined BI as the gathering of information or data to help corporate executives and business managers to study current trends in the market so that they can make informed decisions about carrying their businesses forward (Chee

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et al., 2009; Karim, 2011; Muller and Hart, 2016; Rouibah and Ould-Ali, 2002). Others have defined BI as the technologies, applications and processes for gathering, storing, accessing and analyzing data for purposes of making better decisions (Olszak and Ziemba, 2003, 2007; Shollo and Galliers, 2016; Vizgaitytė and Rimvydas, 2012; Wixom and Watson, 2012).

For Kumari (2013), BI can be seen as the ability of a firm to use its capabilities and processes to create knowledge that will ultimately help it get the right information to the right people, at the right time and through the right channel. According to Kumari (2013), the main aim of BI is to support better decision making in a firm.

What is common from these definitions is that BI is a system that aids decision makers to make informed decisions about the direction the business has to take. For purposes of this paper, BI is seen as a system comprising technologies, tools and softwares that enable a firm to gather data, automate and generate information that will be converted to knowledge for use in making quality decisions.

In other words, BI is all about gathering data in a business from numerous sources in the business environment and from within the business itself and then using technology to store, process and retrieve that data for use by decision makers within the business as and when they need to do so. This will then help assist them understand how the business is doing, where weaknesses exist and what opportunities and threats there are in the business environment or within the business that decision makers can set their eyes on and take appropriate steps (Shollo and Galliers, 2016).

The focus of this paper, therefore, is on how BI helps tourism firms to assess their business environment within the framework of Porter's five forces model as modified by Downes (1997) in order to be competitive in the industry. BI information can be sourced from among others, business publications, news media, academic studies, trade shows, suppliers, customers, employees from other businesses and general business "rumors" provided by people (Hitt *et al.*, 2012; Horakova and Skalska, 2013; Karim, 2011). Other sources include the internet and anything that the firm can come across as business information (Muller and Hart, 2016; Negash, 2004). The adoption of a BI system in tourism and other businesses is, therefore, meant to assist the business improve process efficiency, turnaround time for decision making and the quality of decisions being made.

In fact, the assertion by Korte *et al.* (2013) that a BI system can act as a driver to maintain a sustained competitive advantage over competitors is more apt about the positive role that a BI system plays in any business's competitiveness initiatives. Korte *et al.* (2013) also observe that a BI system helps a business preserve existing customers while at the same time making the business more attractive to new customers. This happens through appropriate decisions made by those within the business on the basis of the information stored and processed within the business BI system. As a result, businesses that have adopted a BI system and are able to utilize it fully are inevitably destined for success (Korte *et al.*, 2013). When businesses have a BI system in place, it makes it easy for management to have immediate access to information about the status or any activities taking place in the various departments of the business like finance, production, customer services and sales and marketing (Korte *et al.*, 2013).

The BI system makes it easy for them to read reports that could inform them about how their product offerings are performing and whether or not there is any return on investment in the various products and other initiatives they may have introduced (Shollo and Galliers, 2016). BI also assists businesses to appreciate their own capabilities in terms of strengths and weaknesses relative to those of competitors (Korte *et al.*, 2013). This would then inform the business on which areas to make amends and which ones to concentrate on in order to attain a competitive edge over competitors or to sustain the competitive advantage if already attained. Further, management would then be in a position to make fact-based

decisions on what next steps they ought to take in order to make their businesses a success. Given these great benefits of BI to businesses that have adopted it, there is no doubt that in future success in tourism businesses will largely depend on how much BI innovations they have adopted. The next section looks at the origins of BI in order that there be a clear understanding of the concept and how it came to fit in the world of business.

2. Historical development of BI

The roots of BI can be traced from among others, military planners and strategic thinkers (Prescott, 1995). BI was, therefore, adopted from the military for use in business (Nickols, 2000). Intelligence has been a significant factor in military success for thousands of years where soldiers would scout, monitor and analyze data about the activities of their rivals (Nickols, 2000; Prescott, 1995). For Tzu (2000, p. 152), "what enables the wise sovereign and the good general to strike and conquer, and achieve things beyond the reach of ordinary men, is foreknowledge." This "foreknowledge" is information sourced through mainly BI tools.

Taking a military approach, Albescu et al. (2008, p. 7) observe that the use of BI for earning a competitive advantage is "an approach that is war-like, with terminology taken from the military field (intelligence, counter intelligence and techniques as well)." Like in war, businesses compete to win market share, in the same environment (Albescu et al., 2008). Businesses just like soldiers need to have information about their competitors in order to outperform them.

Vine (2000, p. 4), also emphasizes the philosophical foundations of BI in military thought:

> […]..BI can be traced back to ancient philosophies of Sun Tzu who wrote about laying plans, tactics, maneuverings, the use of spies etc, circa 300BC. The collected writings have been rediscovered, lending credence to the assumption that warrior philosophies embracing an old form of business or competitor intelligence have been embodied in The Art of War for centuries.

Ancient military philosophers like Nicollo Machiavelli, Hannibal and Maj. Gen. Carl von Clausewitz (Vine, 2000) are seen as some early military strategists whose influence is now being felt in business because businesses find themselves having to devise clever strategies to out compete each other. It is for this reason that their philosophy for competition in the military then now forms a large portion of a continuum of thought in business competition.

The advent of information and communications technology (ICT), especially the electromechanical age that brought technological innovations like telecommunications as was used largely during the First World War and, later, the Second World War, also cultivated a fertile ground for innovations that would later be used in businesses (Small, 1994). During the First World War, telecommunication apparatus like telephones and radios were developed and used to improve information dissemination between soldiers (Small, 1994). Those that were not quick enough to adopt the telephone and radio communication systems were therefore at a disadvantage of receiving information about either the enemy or their fellow fighters late (Kahn, 1984). Others even gained more competitiveness when they gained capabilities to shut down enemy's communication systems (Small, 1994). More innovations took place in the second world war when some of the first generation of computers were created, marking a stage in ICT that is known as the electronic stage, which is the stage between 1940 and the present (Watson, 2012). There was even more usage of such ICT initiatives as remote sensing for purposes of gaining access in to enemy secrets such as strength, plans and capabilities by among others encrypting their communication systems (Watson, 2012). All these innovations would later inform business thinking and innovation for success in the market as evidenced by BI systems being adopted by many businesses across the world (Watson, 2012).

Literature on BI, therefore, indicates that BI was adopted by many businesses in the developed world, especially Europe, in the early stages of the ICT revolution (Buhalis et

al., 2011; Muller and Hart, 2016; Ponelis and Britz, 2012). Africa and the rest of the world followed suit especially from the latter part of the twentieth century, gaining more credence during the twenty-first century (Shollo and Galliers, 2016; Vizgaitytė and Rimvydas, 2012). At the moment, therefore, the use of BI is spread in most businesses across the world (Höpken *et al.*, 2015; Olszak and Ziemba, 2003, 2007; Wixom and Watson, 2012) including the tourism business. Despite this, there does not seem to have been enough academic focus on the use of BI on individual tourism firms and the kind of competitive advantages that the system brought to the said firms (Barbosa *et al.*, 2010; du Plessis *et al.*, 2014; Iunius *et al.*, 2015; Ritchie and Crouch, 2010).

3. BI use in tourism for high competitiveness

The tourism industry comprises of mainly the accommodation sector, attractions sector, transport sector, travel organizer's sector as well as destination organization sector (Middleton and Hawkins, 1998). Each sector supports and complements the other such that without others, the tourism industry will not be complete (Ramayah *et al.*, 2011; Xu, 2010). For instance, tourists need the transport sector to travel to their intended destinations (Ramayah *et al.*, 2011). They also need to be hosted in decent accommodation facilities for them to be safe and feel hospitable (Ramayah *et al.*, 2011). The attractions sector is critical for the amusement and memorable experiences that tourists gain by visiting exciting areas like museums, historical monuments and other places of natural or built beauty (Smith, 1994). Tourists also need the travel organizers and destination organization sectors for facilitation of where to visit and the quality of sites and places to be visited (Ramayah *et al.*, 2011; Xu, 2010). They will further need good restaurants and outlets for memorable experiences of their visit to the place in question (Ramayah *et al.*, 2011; Smith, 1994; Xu, 2010). So, the tourism industry straddles many sectors. Therefore, it is important to fully appreciate how systems like BI can enhance the tourism industry's competitiveness.

Most tourism firms that adopt BI systems usually use it to assist with storing large data about tourists that would have sought their services like those they may have accommodated (Fuchs *et al.*, 2014; Höpken *et al.*, 2015). The BI system will be able to store data on tourists' experiences, data on their contacts and places of origin, destination choices and activities they may be interested in (Fuchs *et al.*, 2014). In this case, tourism firms may learn about how best they can improve their accommodation services to the tourists in line with their preferences (Vajirakachorn and Chongwatpol, 2017). Similarly for the travel organizer's sector, tourism firms would use the BI system to collect data on tourists' memories about the areas they visited (Höpken *et al.*, 2015). This would assist in making better decisions in future about which areas to take tourists to when they visit (Höpken *et al.*, 2015).

Most writers on tourism have been largely concerned with such issues as community-based tourism, socio economic benefits of tourism to host communities (Mbaiwa, 2004; Sebele, 2010; Stone and Rogerson, 2011), problems and prospects of sustainable tourism (Buckley, 2012; Lim, 1997; Mbaiwa, 2005; Page and Getz, 1997; Swarbrooke and Horner, 2001), socio-cultural impact of tourism development (Mbaiwa, 2005) and effects of tourism development on rural livelihoods (Mbaiwa and Stronza, 2010). Although most writers of yesteryears did not focus on the role that BI plays or has played in the tourism industry, the few who did were largely concerned with how BI can enhance tourism destination competitiveness. The majority of this research on how BI enhanced country destination competitiveness was done in Europe (Barbosa *et al.*, 2010; du Plessis *et al.*, 2014; Iunius *et al.*, 2015; Ritchie and Crouch, 2010). Writers like Fuchs *et al.* (2013, 2014) laid a critical foundation for research on use of BI in the tourism industry. Their area of focus was on how BI has enhanced the competitiveness of tourism destinations in Sweden by assisting with better understanding of business performance, tourist or customer behavior and their perceptions about products and services offered.

Other literature also exists, where there is evidence of some tourism firms having adopted BI in their daily operations in order to profile their customers with a view to not only retaining them but also attracting more (Ranjan, 2009; Vajirakachorn and Chongwatpol, 2017; Xiang et al., 2015). Although some studies do not show BI having been used for purposes of aiding decisions on choice of competition strategies, for purposes of keeping track of customers and improving process efficiency, in terms of helping customers access a firm's services, the presence of a BI system still enhanced a tourism firm's competitiveness (Ranjan, 2009; Vizgaitytė and Rimvydas, 2012; Vizjak et al., 2010). Other tourism firms normally use a BI system to market their products and services (Correia et al., 2013). Again, this eventually makes the firm competitive (Fyall and Garrod, 2005). What is clear though is that since most tourism firms that adopted a BI system in order to be more efficient, improved both their efficiency and also their competitiveness, there can be no doubt that if such firms were to adopt a BI system with a clear focus on improving their competitiveness, then they would most likely achieve dominance in the market in which they do business (Correia et al., 2013; Höpken et al., 2015).

According to Vizjak et al. (2010), one of the basic aims of a BI system that is used for competition purposes is to protect a firm's information from competitors. In the same vein, such a BI system also helps a firm gain access to its competitor's information (Vizjak et al., 2010). This then makes the firm with its competitors' information more competitive. It further makes a BI system an enabler of high competitiveness (Vizjak et al., 2010). It is for this reason that some writers have identified BI as a critical system for any company wishing for success in its chosen business area (Yeoh and Koronios, 2010). BI has been known to assist businesses that have adopted the system to have readily available information that is useful for decision-making purposes (Fuchs et al., 2014). These can be decisions as they relate to improvement of the internal processes about the day-to-day running of the business or decisions relating to the direction that the business has to take in order to remain competitive and increase profits and revenues for its shareholders (Fuchs et al., 2014). It is for this reason that businesses that have adopted a BI system tend to have more competitive advantages than those without a BI system (Guarda et al., 2013). The next section looks at some environmental analysis models that can be used alongside BI to better understand the business environment within which tourism firms operate.

4. Environmental analysis

In order to clearly understand competitiveness and how BI fits within the realm of tourism business competition, two environmental analysis theories or models will be used for illustration. These are the industry model and the resource-based view (RBV) model. Of the two, the RBV model has been found to be the most suitable for this paper as will be shown in the next sections. However, a fair appreciation of what the industry-based approach entails will still be attempted as a demonstration of how a BI system still works, for a better understanding of the tourism firm's business environment.

4.1 Industry model

According to Porter and Millar (1985), firms are able to earn a competitive advantage by positioning themselves better than their competitors in the field or industry in which they operate. Porter and Millar (1985) developed five forces believed to be critical for firms to understand and contend with, for them to remain competitive in whatever industry that they did business.

In later years, however, some scholars like Downes (1997) added more forces to the ones proposed by Porter and Millar (1985), arguing that the dynamics of business growth and competition have not stayed the same since Porter first came up with the five forces. The five forces that Porter came up with were: the threat of new entrants, bargaining power of buyers,

bargaining power of suppliers, threat of substitute products and the intensity of rivalry among industry competitors (Porter and Millar, 1985). The three more forces that Downes (1997) added are digitalization, deregulation and globalization, as shown in Figure 1.

The view of Porter and Millar (1985) and Downes (1997) is that successful businesses have to fully understand their business environment in line with the forces outlined for them to not only survive but to also be competitive in the market. Proponents of a BI system, therefore, argue that a firm can better understand its environment when it has adopted the BI system (Olszak and Ziemba, 2007). A BI system enables a firm to capture, store and utilize huge data collected from within the firm and also from its environment (Olszak and Ziemba, 2007). This, therefore, means that a firm with a BI system can better use the Porter and Millar (1985) and Downes (1997)'s frameworks to analyze and understand its environment than one without a BI system (Albescu et al., 2008; Azma and Mostafapour, 2012; Azvine et al., 2006; Fuchs et al., 2014). In line with this view, BI is therefore an enabler for businesses that aim for success in a competitive environment.

The next section discusses some of the major assertions of the RBV model which is important for this paper in that BI is seen as a component of the RBV model.

5. Resource-based view model

A fair appreciation of the RBV modelis seen as a very critical aspect in the application of the BI system in any business. The RBV model believes that businesses' internal resources and capabilities are the main determinants for businesses' success or failure in the market (Barney, 1991b; Wernerfelt, 1984). They see the businesses 'strategic choices on how to compete in their external environment based on the type and strength of those resources and capabilities (Barney, 1991b; Barney, 1995; Wernerfelt, 1984). In short, the RBV theory sees a firm's resources as the primary determinants of its performance and contributing to its overall competitiveness (Barney, 1991b; Hamel et al., 1989; Peteraf, 1993; Stalk, 1992). Newbert (2008) and Hitt et al. (2012), however, add that such resources should also be rare, valuable and not substitutable. According to the RBV theory, resources include assets,

Figure 1 The new eight forces model of competitive advantage

Source: Adapted from Downes (1997)
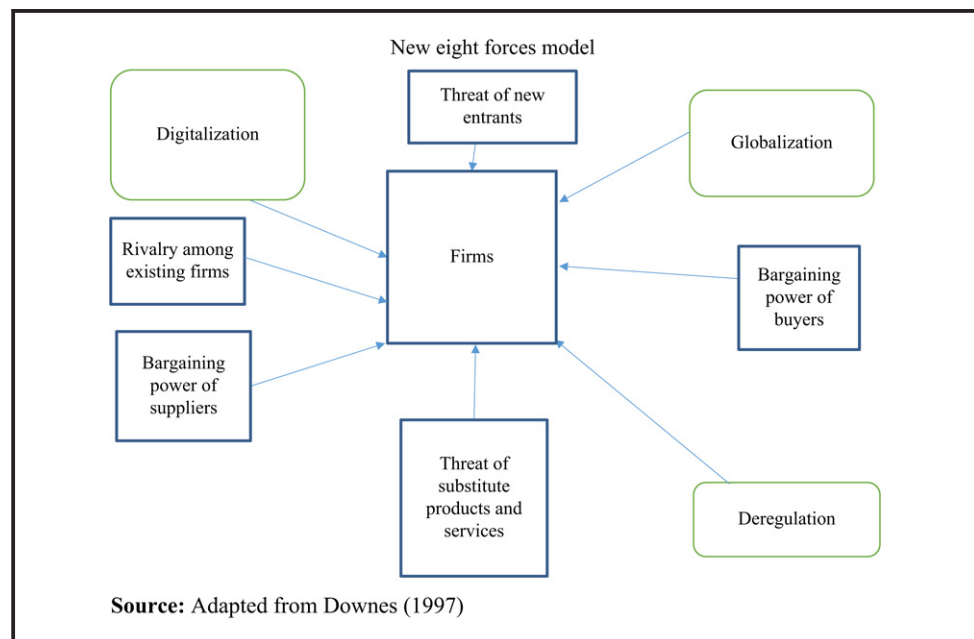
capabilities, organizational processes, firm attributes, information and knowledge controlled by a firm to enable it to formulate and implement strategies that improve its efficiency and effectiveness (Akio, 2005).

As an internal resource that a firm adopts for efficiency and competitive purposes (Fuchs et al., 2014), BI is seen in this paper as part of a firm's internal resource in line with the RBV model. BI is, therefore, being used as the basis upon which to understand the business environment through its system capabilities. RBV scholars emphasize that it is the kind of resources that a firm has that help it earn a competitive advantage over its competitors if such resources are difficult for others to imitate (Barney, 1991b; Hamel et al., 1989; Lin and Wu, 2014; Peteraf, 1993; Stalk, 1992). According to Barney (1991a), four main resources' indicators that determine a firm's ability to sustain its competitive advantage are value, rareness, inimitability and non-substitutability. The argument here is that a firm's resources should be unique and should not be easily imitable or replicable by other firms.

Although BI has not been singled out as one of the resources that a firm can boost of, Akio (2005) includes information, knowledge and organizational processes as some of a firm's assets that can be leveraged for competition. All these are strong capabilities of a BI system (Olszak and Ziemba, 2007). Akio (2005) also observes that it is not just enough to have resources to leverage competition but also the skills to deploy those resources, individually or in combination, using organizational processes to achieve the company's strategic goals. In this case, skills or capabilities that a firm has also form part of its resources that it can leverage on for competition (Akio, 2005).

Grant (1991) argues that while resources are the source of a firm's capabilities, its capabilities are the source of its competitive advantage. For purposes of surviving and remaining competitive in the market, capabilities are, therefore, more important than resources (Grant, 1991; Lin and Wu, 2014). In this light, BI is not just a resource but also a resource with capabilities for competitiveness.

For purposes of this paper, therefore, BI is seen within the RBV model as part of the resources and capabilities that a firm needs for it to be competitive. In this context, therefore, a BI system which has to be installed in a firm forms part of the firm's internal resources that could be used to leverage competition. In line with Grant (1991), BI is taken as an important capability that firms need to have in order to be competitive in the market. Within the general internal resources that the RBV theory encompasses, this paper only focuses on the BI system.

The primary reason for using a BI system is to improve a firm's competitiveness as shown in Figure 2. This improvement in the firm's competitiveness is a result of quality decision making that is informed by the various stages that data collected for purposes of aiding decision making undergoes. As shown in Figure 2, the data are first transformed into information, then information into knowledge (Olszak and Ziemba, 2007). It is the knowledge that a firm gains after going through this process that allows it to make informed decisions on the competition strategies to adopt (Olszak and Ziemba, 2007). Such informed choices would then lead to high firm competitiveness. As observed by Olszak and Ziemba (2007), even after a firm has gained high competitiveness, it needs to keep monitoring its processes and the business environment in order to maintain its competitive advantages.

According to Rouibah and Ould-Ali (2002) and Olszak and Ziemba (2007) implementation of BI goes through some stages. First, as also shown in Figure 2, is the data collection and consolidation stage which involves targeting, where a firm would survey its environment and set its tracking priorities (Olszak and Ziemba, 2007). The firm would then, in the second stage, track and identify crucial signs either of lurking danger or of opportunities abound in the business environment (Olszak and Ziemba, 2007). Once the data have been collected, compiled and analyzed, it will in the third stage be processed in to knowledge which will now be useful for the final stage of decision making, as shown in Figure 2 (Olszak and Ziemba, 2007). Action will then take place through decisions that will be taken. Rouibah and

Figure 2 Firm resources and capabilities of a BI system implemented in tourism businesses

Source: Adapted from Olszak and Ziemba (2007)

Ould-Ali (2002) warn that this process has to be executed with great thoroughness lest a misdiagnosis results, leading to failure in the use of BI.

These observations talk to the skills that tourism firm employees ought to have in order to be able to correctly process data to information, then information to knowledge which will then be used to aid decision making (Chee *et al.*, 2009; Muller and Hart, 2016). The observations form part of the literature that helps enrich knowledge about BI and its processes. It is also helpful in bringing to the fore issues related to the kind of skills that tourism firms ought to have to remain competitive and be ahead of their competitors all the time.

The next section discusses each of the common components of a BI system which include data warehouses, Extract Transform and Load (ETL) tools, On-Line Analytical Processing (OLAP) techniques and data mining (Olszak and Ziemba, 2007; Shollo and Galliers, 2016), which have been highlighted in Figure 2. Each component is explained to demonstrate the role it plays in the successful implementation of a BI system.

5.1 Data warehouses

Data warehouses refer to collections of some business data that are organized and validated in readiness for analysis to aid decision making (Kirange, 2016; Olszak and Ziemba, 2003; Shollo and Galliers, 2016). In Figure 2, all the tourists' data alluded to in the first stage are stored in the data warehouse (Olszak and Ziemba, 2007). The data would have been extracted from various databases both from within and outside the organization. As shown in Figure 2, the data largely comprise activities of tourists before, during and after a visit. It is a collection and consolidation of such information. For best results, data warehouses ought to be integrated into an organization's information system (Olszak and Ziemba, 2007).

A data warehouse is considered the core component of a BI system (Negash, 2004) because it stores aggregated information as well as data that has been analyzed through ETL tools for ease of use by those in the various stages of decision making (Kirange, 2016; Olszak and Ziemba, 2003; Shollo and Galliers, 2016). For the tourism industry, data collected for storage in the data warehouse can include data about products tourists purchase, services they experience, destination choices they evaluate, and the kind of accommodations they select so that tourism firms can fully understand the behavior of tourists in order to increase their satisfaction and boost business revenues and profits (Vajirakachorn and Chongwatpol, 2017). A data warehouse cannot be complete without the deployment of ETL tools which ensure that all data collected and compiled is appropriately loaded in to the warehouse, as shown in the next section.

5.2 ETL tools

ETL tools are processes that are responsible for the extraction of data from one or more source systems and for transforming the said data from different formats in to a common one before loading the data in to the data warehouse (Schink, 2009; Shollo and Galliers, 2016). ETL tools usually focus on extracting information deemed to be crucial for the business. According to Olszak and Ziemba (2007), the three stages of ETL are:

1. The extraction stage: this involves obtaining access to data originating from different sources.

2. The transformation stage: this involves the transformation of the extracted data in to the same format in readiness for that data to be loaded in to the BI system.

3. The load stage: the last stage is the loading stage which is responsible for loading the transformed data into the organizational data warehouses. This data would have been filtered and segregated.

As shown in Figure 2, the compiled and consolidated data will help tourism firms to get hold of traces of tourists' thinking, plans and any other data about tourists that the firms could use to prepare themselves for the future (Kirange, 2016). Data are then processed into information, after the data have been collected, compiled and consolidated, as demonstrated in the next section.

5.3 OLAP techniques

The main aim of OLAP techniques is to analyze complex data in real time on a database that is constantly being updated with transactional data (Kirange, 2016; Olszak and Ziemba, 2007; Shollo and Galliers, 2016). The analysis will then result in knowledge about what tourists are thinking and intend doing (Olszak and Ziemba, 2007), as shown in Figure 2. The OLAP is able to search huge data files automatically. It also allows for user access, analysis and modeling of business problems and sharing of information that is stored in data warehouses (Olszak and Ziemba, 2007; Shollo and Galliers, 2016). OLAP helps managers with multi-dimensional tools to analyze data from multiple perspectives in order to discover hidden information and act as may be necessary (Matei, 2010).

5.4 Data mining

Data mining refers to some techniques that are designed to identify relationships between data within a data warehouse in order to aid tourism firms to make appropriate decisions based on available knowledge (Kirange, 2016; Olszak and Ziemba, 2007) as shown in Figure 2. The data mining process involves discovering various patterns, generalizations, regularities and rules in data resources (Kirange, 2016; Olszak and Ziemba, 2007; Shollo and Galliers, 2016). Knowledge acquired from data mining may be used to predict an outcome of a decision (Shollo and Galliers, 2016). Techniques for data mining include

classification, estimation, prediction, time series analysis and market basket analysis (Zeng et al., 2006). These techniques are usually aligned with the needs of an organization in order to help decision making by discovering various patterns, generalizations, regularities and rules in data resources (Zeng et al., 2006).

Indeed, all BI components may result in improving a firm's competitiveness because a firm that implements a BI system would automatically gain competitive advantages over business rivals (Karim, 2011; Ranjan, 2009; Thamir and Poulis, 2015). However, a BI system with a direct focus on competition is one that can achieve better results in improving a firm's competitiveness (Ranjan, 2009) because it will still have some components that improve organizational efficiency as any BI system should have, yet having more impact on a firm's competitiveness as that will be the focus of those who drive it (Kirange, 2016; Olszak and Ziemba, 2007; Shollo and Galliers, 2016). As demonstrated in the next section, the tourism industry was one of the first to adopt information technology, which gave birth to BI, and the results have been promising (Bethapudi, 2013; Buhalis et al., 2011). For this reason, BI remains important for the success of tourism firms across the world (Buhalis et al., 2011; Buhalis and O'Connor, 2005).

6. Conclusion

This paper has unpacked the notion of BI as used in businesses, especially tourism businesses. From the literature that was reviewed in this study, the use of BI in businesses has resulted in better decision making as a result of improved data management processes. With a BI system in place, businesses can easily gather, store and process information as and when they need it. Tourism firms, therefore, can gain high competitiveness if they adopt the BI system. There is no doubt, therefore, that the future of tourism firms lies in BI adoption, given the high efficiency and competitiveness that BI brings to tourism businesses that adopt it. Taking cue from the existing literature on BI and its use on tourism, this paper has generated more literature on the subject matter but this time focusing on BI use in tourism firms for purposes of gaining competitiveness. This is in contrast with much of existing literature which focuses more on use of BI for tourism destination competitiveness. Despite this intervention, possible avenues of further research on BI use in tourism still exist. Future studies could exploit more quantitative approaches to determine the extent of BI usage in tourism firms. This could assist with more knowledge on level of uptake of BI systems by tourism firms. Such studies could further bring to the fore the amount of benefits that have been realized by the businesses that have adopted BI systems.

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