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The Impact of Business Intelligence and Knowledge Management on Sustainability Performance in the Tourism Industry in Algeria

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Abstract: In today's business context of globalization, competition, knowledge economy, rapid technological changes, and external environmental factors, knowledge management and business intelligence on the tourism level have received increased attention in an effort to identify smart performance factors and change the structure of organizations. Similarly, the tourism industry has experienced considerable development during recent decades. Moreover, sustainability is becoming increasingly important for society and is especially critical in the operation of the tourism industry. It is well known that sustainability is a prerequisite to carrying out any activity. This evaluates the relationship between knowledge management in operations and business intelligence systems on the sustainability performance within the tourism industry in Algeria. A total of 126 questionnaires were distributed to the study sample. A multiple regression analysis was used to test the hypotheses of the study. This study concludes that there is a positive relationship between knowledge management processes and sustainability performance. Further, the components of business intelligence have positive impacts on sustainability performance. The results can facilitate utilizing the knowledge management processes and business intelligence implementation in Algeria's tourist industry.

Keywords: business intelligence, decision support systems, knowledge management, sustainability performance, tourism industry.

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INTRODUCTION

In the world that we are living in today, tourism organizations are the main instruments of society for the constant pursuit of knowledge. According to (Ali Akasha et al., 2020), the new sector in the tourism industry is the initiative to provide what the tourist does not expect, and this work can only be performed by organizations that are efficient and efficient, and capable of providing tourism services and modern quality features (Akbaba, 2006). Similarly, the tourism industry has a big service and human focus with experts who work, act and plan purely on their instincts rather than on definite knowledge. In the last decades, the role of knowledge in the world economy has been acknowledged as fundamental as a production factor, and as the main asset for the

development of innovation (Brandão et al., 2020). Moreover, Knowledge Management (KM) in the tourism industry which is greatly services-oriented has a high potential of organizational knowledge to manage. Besides that, the essentials of the KM process involve identifying relevant knowledge and capturing it, transferring, and sharing it, and ensuring that organizations are engineered to optimize flows and to manage them efficiently. According to Brahami et al. (2020), The main goals of KM are the achievement of specific results (e.g., shared intelligence), improved performance, competitive advantage or higher levels of innovation and the creation of new products and services. At the same time, the tourism industry can use knowledge as their resource to achieve their objectives, where it can be realized only if such knowledge is managed well (Brahami et al. 2018). Effective management of knowledge in a knowledge economy is a key resource to attain higher competitive advantages, and enhanced performance (Nguyen & Kohda, 2017). According to Cooper (2006), tourism has been slow in adopting the KM approach. However, the generation, use, and sharing of knowledge are critical for the competitiveness of the tourism industry. Moreover, knowledge has become one of the most invaluable resources to organizations and their main source of sustainable competitive advantage. The increased awareness of sustainability is emphasized by the number of sustainability reporting frameworks being implemented (Shahbudin & Amran, 2011).

In past decades, the use of Information and Communication Technologies (ICTs) is included in all the activities namely tourism industry and sustainable development. This last is a knowledge-intensive industry and obviously creates and uses large amounts of data and information. Also, existing Information Technology (IT) in the tourism sector has the capability to handle and support vast troves of data and content. At the same time, the data are considered a critical piece that helps to improve decision-making in the tourism industry sector. For this reason, Business Intelligence (BI) technologies show the capacity to handle large amounts of structured as well as unstructured data to help identify, develop or create new strategic sustainability decision opportunities. Therefore, the development of Business Intelligence (BI) is characterized by tools specialized in extracting, transforming, and loading heterogeneous data from different data sources into a central data warehouse store. These tools could also organize, visualize, and descriptively analyze data, such as doing online analytical processing (OLAP), balanced scorecard, and data/text mining. Besides that, Business Intelligence (BI) is a solution to overcome challenges and effectively manage sustainability information (Haupt et al. 2015). However, the tourism industry needs to overcome several challenges associated with BI and KM to ensure a BI and KM solution are correctly implemented and are effective in solving the problem of effective sustainability information management.

In today's global environmental demands, tourist structure management has been increasingly aware of the need for sustainability management, which aims to achieve social, environmental, and economic performance simultaneously. In this context, it is interesting to observe that there has been little empirical research about the use of all these concepts and technology so far in the context of the tourism industry in Algeria. Meanwhile, the tourism is not exclusively an economic phenomenon in Algeria, also involves social, cultural, economic, and environmental aspects. For this reason, Algeria can become a source of tourists in the Mediterranean region due to its strategic location, but also globally. In terms of tourist flows in Algeria, 3,539,964 foreigners visited Algeria last year (2019), an increase of 23.57% compared to 2018. Indeed, KM is an important means of tourism development in Algeria. It can be used as important technical support and platform for sustainable development of the tourism industry in the new period. On the side, we can note that business intelligence technology has had exceedingly great benefits to the tourism industry, especially in line with the provision of services that are up to date with the current trends in the sector. Moreover, the focus in the business intelligence report is on the necessity to make a correct benchmark in terms of sustainability to have the highest impact on stakeholders.

Considering this situation, this paper aims to examine the relationship between knowledge management processes and business intelligence systems and the effect on each other and to study the role of knowledge management processes and business intelligence systems in improving sustainability performance (economic, social, and environmental). The model is then applied to the western region of Algeria to test the evaluation framework and index system and measure the performance of this destination in the test period from 2018 to 2020.

In theory, KM practices can be defined as the set of management activities conducted in a firm with the aim of improving the effectiveness and efficiency of organizational knowledge resources (Kianto et al. 2017). According to Handzic & Durmic (2015), KM involves collecting, organizing, and distributing knowledge that is accumulated over a period for the purposes of improving and increasing a company's competitive edge. In the knowledge creation process, everyone needs to acquire knowledge from other people and make use of his/her own knowledge at any given time (Wang & Ren, 2013). On the other side, KM is a cyclic process with a set of activities, techniques and practices that will simplify the process of capturing, creating, storing, distributing, and sharing tacit and explicit knowledge (Mian et al. 2010). For Jennex (2005) KM is then the practice of selectively applying knowledge from previous experiences of decision making to current and future decision-making activities with the express purpose of improving the organization's effectiveness. According to (Ermine et al. 2010), KM can be defined as technologies and practices embedded in an information infrastructure that supports the creation, sharing, and leverage of intellectual assets in an organization. For Muchran (2020), KM is an important activity that adds value and closely links to an organization's strategic plans where its activities will contribute to overall organizational strategic advantage and profitability. Indeed, tacit/explicit KM is extremely rich and dynamic: It has become the main source of development for any organization. Also, the decision-makers have recognized the reality of knowledge resources as a major resource and now they consider it more valuable than material resources (See Figure 1).

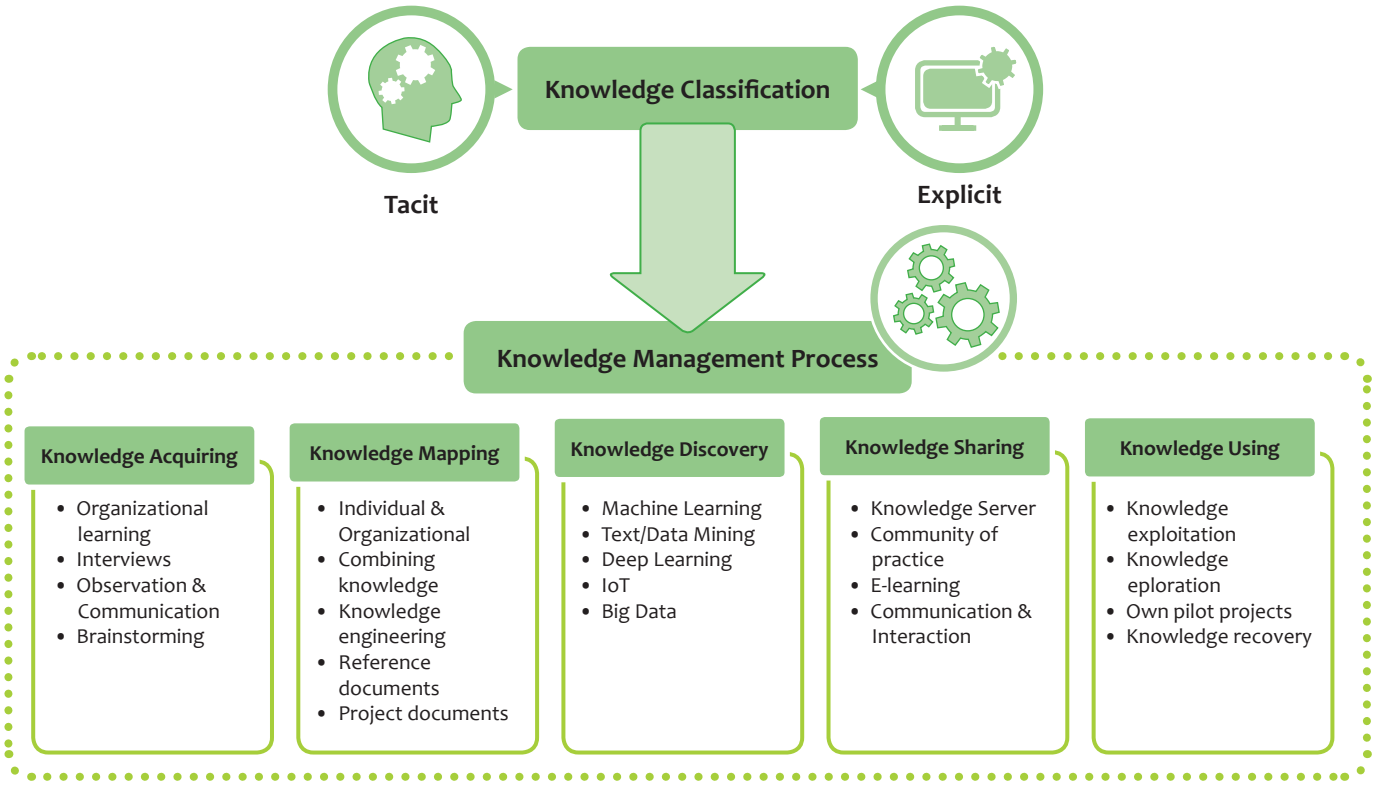

Figure 1 The practices related to the KM Process

Reviewing the literature, we can see the importance of the KM concept in the Tourism Industry. Similarly, knowledge management has a significant effect on tourism performance through (tacit and explicit) knowledge capital. Using knowledge management techniques and technologies in tourism is as vital as it is in the corporate sector. As per our objective (Brahami et al. 2020; Brahami & Matta, 2019) highlights that it is fundamental to determine, acquire, use and convert the tacit knowledge of tourism managers/experts to an explicit form to transform an organization's knowledge assets into competitive capabilities. Based on the extant literature, we study KM as a combination of Knowledge Acquisition (KA), Knowledge Mapping (KMap), knowledge Discovery (KD), Knowledge Sharing (KS), and Knowledge Using (KU) (See Figure 1). According to Mistilis & Sheldon (2006), the particular knowledge management issues that face the tourism industry as a result of its compound of fragmented and heterogeneous, yet interrelated organizations make it difficult to transfer knowledge. For instance, the initial work of Belias et al. (2018) have investigated how knowledge management can become a useful tool in the process of leveraging a tourist organization. Another research by Ritsri & Meeprom (2019), is to examines the role of knowledge management practices in accounting employee productivity in the tourism industry in Thailand. The results of this research showed that knowledge management practice had a positive relationship with financial statement quality, financial statement users' satisfaction, organizational image creation, and a true and fair view of accounting information in this field. Another research by Avdimiotis (2019), is to associate emotions- as a determinant factor of behavior with tacit knowledge management in hospitality establishments. To prove the association quantitative research was held on a stratified sample of 128 hotel employees in Northern Greece. Lopes & Farinha (2020) have analyzed the dynamics underlying the mechanisms of transfer of knowledge and technology between academia and the tourism industry. Two interviews and research were applied to managers of SMEs. SMEs consider highly educated employees central to the knowledge transfer process but do not give any incentive to their employees to graduate. According to Zaei Mansour & Zaei Mahin (2014), tourism knowledge is heavily labor dependent, and employees use their knowledge in providing the best experience for customers. Therefore, it is crucial that companies use the KM approach to retain employees and customer satisfaction. Another study by Kharel et al. (2019), is to identify various dimensions of knowledge management in tourism and hospitality sectors based on a literature survey and to suggest managerial implications for managing knowledge in tourism and hospitality enterprises. Another research by Jia et al. (2012), is to presents an academic framework of knowledge management systems for tourism crisis management. The framework is an autonomous software system and is capable of collaborating in the extraction and dissemination of knowledge in all stages of the crisis. The combinations of artificial intelligence and web-based technologies are applied in the framework that can collect, sort, store, and share the information throughout the organizations. In the first state-of-the-art survey done by Hallin & Marnburg (2008), it is to present empirical KM research in the hospitality fields. Database searches of the KM concept and related topics yielded 2365 hits, of which only 19 empirical articles were identified. The empirical quality of articles is assessed against relevant theory-of-science criteria.

Since the literature and the operating people have different definitions of Business Intelligence, we are going to show the different expert's definition of the concept. All of the experts' agreed with each other that the definitions of Business Intelligence (BI) comprise all the activities, applications and technologies needed for the collection, analysis, and visualization of business data to support both operative, and strategic decision-making (Kimball & Ross, 2016). Furthermore, one of the experts means that definition of BI can be viewed in two different ways (Sabri et al. 2017): (1) A system-oriented way which collects, store and present data in different tools, and (2) a process-oriented way, which he describes that the users need some type of

knowledge as well. Processes are collected and the data are presented, and the next thing is to make the data analyzable for the end-users. According to Dedić & Stanier (2016), Business Intelligence (BI) comprises all the activities, applications and technologies needed for the collection, analysis, and visualization of business data to support both operative, and strategic decision-making. According to Strand & Syberfeldt (2020), BI solutions are constantly being developed to support decision-making at various organizational levels. These solutions facilitate the compilation, aggregation, and summarization of large volumes of data. One of the ways of measuring the success of BI usage within the company is assessing the BI maturity.

In summary, most of leaders in the tourism industry use various components within the business intelligence to increase their effectiveness namely integration of data stores such as data warehouses provide access to massive amounts of real-time and historic data for analysis. Online analytical processing (OLAP) cubes provide ease of reporting while advanced analytical tools from forecasting to data mining enable sophisticated data analysis. This level can also be assigned dashboards, planning, and balanced scorecards, which are becoming increasingly important (Azeroual & Theel, 2018). Figure 2 presents an illustration of the basic components of a BI system for the tourism industry.

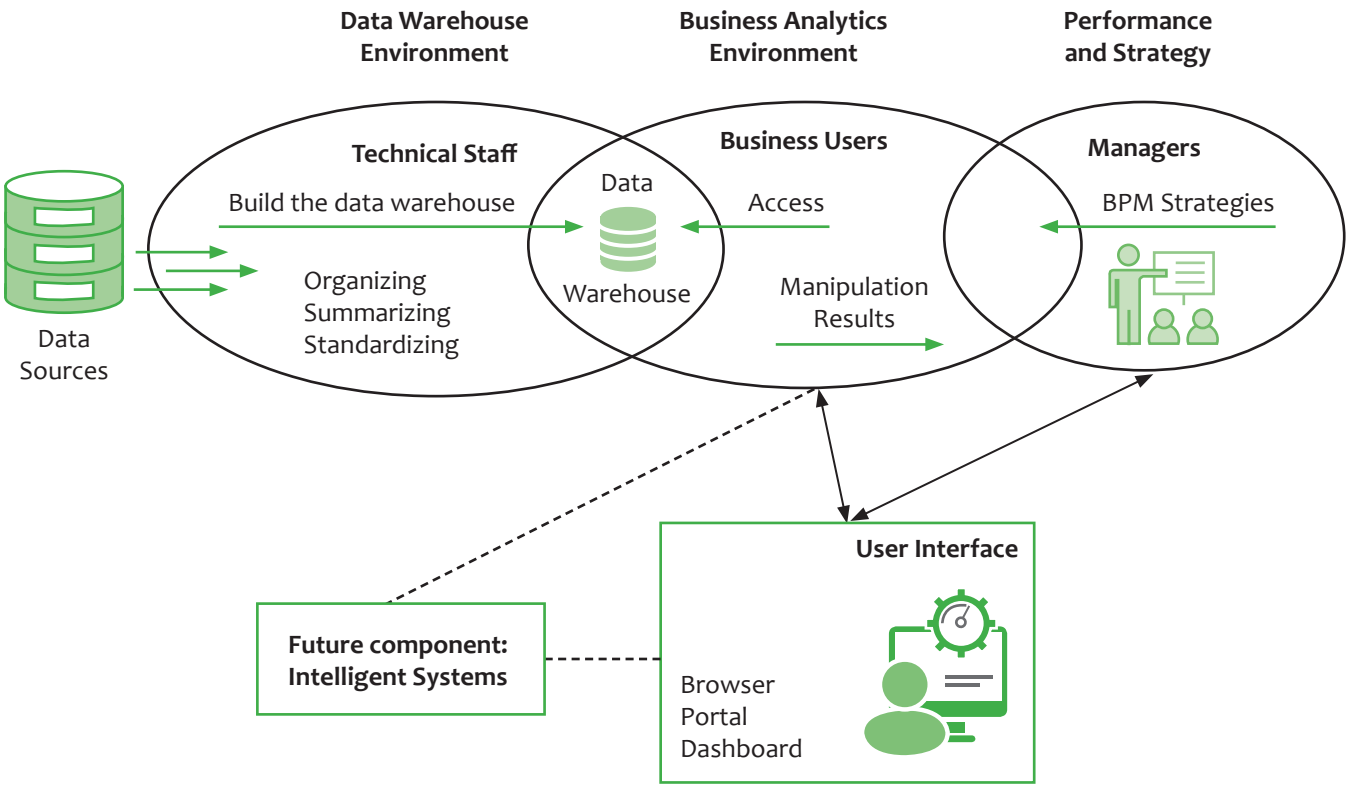

Figure 2 A High-Level Architecture of Business Intelligence (BI)

Early applications of BI can also be found in tourism destinations and the tourism industry. In the first state-of-the-art survey done by Petrini & Pozzebon (2009), it is to explore the role of business intelligence (BI) in helping to support the management of sustainability in contemporary firms. The main contribution of our study is to propose a conceptual model that seeks to support the process of definition and monitoring of socio-environmental indicators and the relationship between their management and business strategy.

Höpken et al. (2015) have proposed a novel approach for business intelligence-based cross-process knowledge extraction and decision support for tourism destinations. The approach consists of a) a homogeneous and comprehensive data model that serves as the basis of a central data warehouse, b) mechanisms for extracting data from heterogeneous sources and integrating these data into the homogeneous data structures of the data warehouse, and c) analysis methods for identifying important relationships and patterns across different business processes, thereby bringing to light new knowledge. In the study done by Khadivar et al. (2016), it is to identify and prioritize BI Barriers in the Iran tourism industry. In this research, Barriers to BI implementation and utilization in Iran tourism industry have been performed using a mixed or combination methodology in both qualitative and quantitative measurement. In the qualitative part the grounded theory method and in qualitative section descriptive survey has been used. Pejić & Vugec (2018) have analyzed the impact of the level of business intelligence maturity on the organizational performance of the company. Moreover, the results of the cross-tabulation analysis of the clusters reveal statistically significant differences in terms of the company turnover and dominant organizational culture between them. Another research by Mariani et al. (2018) it is to examines the extent to which Business Intelligence and Big Data feature within academic research in hospitality and tourism by identifying research gaps and future developments. The study consists of a systematic quantitative literature review of academic articles indexed on the Scopus and Web of Science databases.

To summarize, BI is one of the application areas of growing importance in supporting business decisions. Moreover, all existing major BI and data mining techniques have been applied in the tourism domain. In contrast, the implications of the business intelligence schema in the tourism industry are yet to be well developed and established. However, BI can also be a source of sustainable competitive advantage for an organization. An organization is said to have a competitive advantage over its competitors when it possesses some attributes that allow it to perform better than its competitors.

Broadly speaking, the concept of sustainability is among the most important themes to have emerged in the last decade at the global level. Similarly, Porter & Kramer (2011) emphasize that sustainability is important because it creates a connection between the corporation and the community within which it operates. In fact, they state that there should be a push towards creating shared value between the corporation and the community within which it operates. UNWTO defines Sustainable tourism as "tourism that takes full account of its current and future economic, social, and environmental impacts, addressing the needs of visitors, industry, the environment and host communities" (UNEP & UNWTO, 2005). For Albrecht (2014) the concept of sustainability in tourism was refined in order to incorporate social, economic, and environmental outcomes of tourism development. In the knowledge economy, a key source of sustainability relies on the creation, sharing, and utilization of knowledge. Therefore, sustainability relies on KM execution, due to the needs such as environmental and social awareness and information exchange (Manzoor et al. 2019; Wu & Haasis, 2013). Besides, the Sustainable BI Tool provides performance dashboards to allow users to encapsulate multiple sustainability aspects and to monitor key metrics and key performance indicators (KPIs) (Scholtz & Haupt, 2018).

In recent years, various frameworks have been developed to measure tourism sustainable development in the country. Besides that, the debate on how to measure tourism sustainability performance is still going on because of sector-specific characteristics of measurement. Despite the generic version of sustainability performance comprising of economic, environmental, and social impacts, measurability of tourism sustainability will soon be a possibility with the development of sector supplements. According to Elmo et al. (2020), sustainable tourism can be the motivation to manage resources to satisfy environmental, social and economic needs through cultural integrity, biological diversity, ecological processes, social and economic equity, and general enrichment. For Franzoni (2015), measuring tourism sustainability requires a knowledge of the complexity of tourism

systems and the specifics of any given location. In this sense, Torres-Delgado & Saarinen (2013) have examined the role of indicators in the transition to sustainability in tourism development and planning, identifying their main characteristics (See Figure 3).

Figure 3 The Model of Sustainable Tourism Development

For instance, Yoopetch & Nimsai (2019) have used science mapping techniques to examine 1596 Scopus-indexed documents published on sustainable tourism development. The review also provides guidelines for scholars to develop research that can aid in future sustainable tourism development. Another research by Baker & Mearns (2017), it is to explores the feasibility of the Sustainable Tourism Indicator (STI's) to accurately assess the sustainability performance of tourism ventures relying on a reflection of the experiences gained from applying STI's. If STIs could be successfully applied in a highly sensitive desert environment, it signifies that STIs could be useful in assessing the sustainability performance in other tourism ventures. Another study by Rodríguez-Díaz & Espino-Rodríguez (2016), is to determine the key factors in achieving the sustainability of a tourism destination in relation to the performance obtained. A methodology based on the opinions of stakeholders is developed to determine the sustainability factors and performance in the tourism destination of Gran Canaria. Another study by Laitamaki et al. (2016), is to identify best practices that can help the Cuban tourism industry in implementing a comprehensive sustainable tourism strategy to provide practical recommendations on how to learn from the suggested best practices and how to implement them effectively. Franzoni (2015) proposed a framework for the identification of variables based on three levels (the community, the tourist destination, and the individual organizations) and different dimensions (social, competitive, and economic) that are better

oriented to the behavior of key actors and the achievement of stakeholder consensus. Another research by Zolfani et al. (2015), it is to conduct a comprehensive review of research in sustainable tourism, concluding that the literature can be divided into 14 application areas, some of which are: paradigm, sustainable tourism development, market research, and economics, policymaking, and infrastructure. In summary, the above literature raises several important issues that need further investigation including the need to evaluate global best practices of the sustainable tourism industry. Due to the absence of a common theory, this study will focus on establishing the role of knowledge management processes and business intelligence systems in improving the sustainability performance (economic, social, and environmental) for the purpose of selecting the most appropriate framework for Algeria Tourism Industry.

The proposed model of this research is based on several prior types of research. It indicates how the impact of business intelligence and knowledge management on sustainability performance among the tourism industry in Algeria. We also show that these are the two processes that conduct to creating employees value and knowledge. This proposed research model contains, on the one hand, three dimensions of BI which encompass Data warehouse, Data Mining, and Dashboard. On the other hand, three dimensions of KM encompass knowledge acquisition, knowledge discovery, and knowledge use. Based on the research purposes, hypotheses, and literature review described above, we may obtain the research framework proposed (See Figure 4).

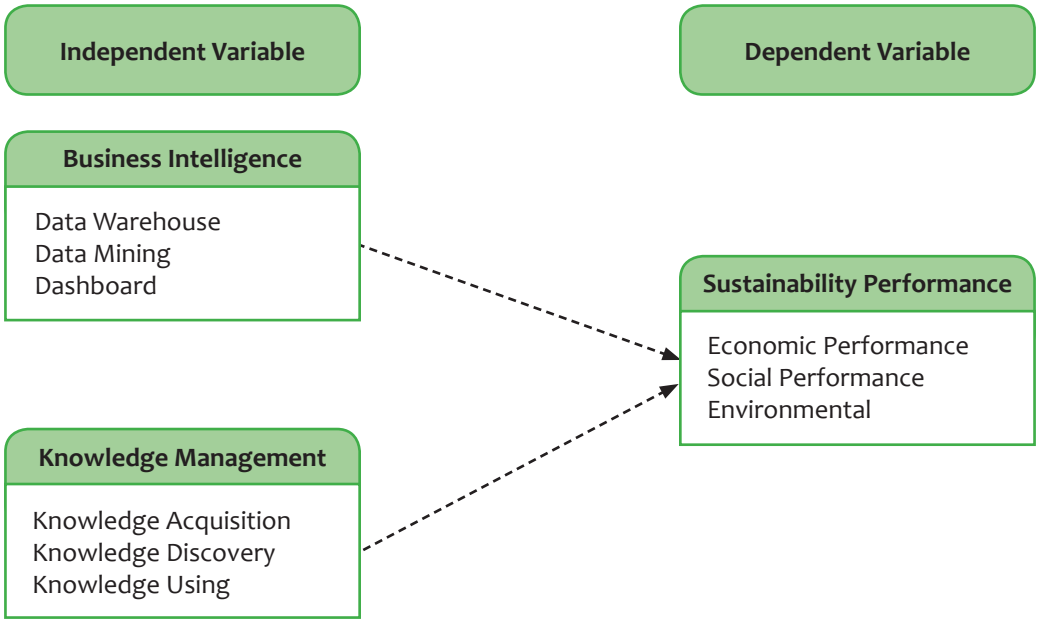

Figure 4 Conceptual and Research framework

METHODS

The objective of this study is to identify the impact level of the BI process and KM process constitutes a dynamic capability to sustainability performance among the tourism industry in Algeria. The method will be discussed in this study in the following order: research design, population and sample, data collection method, data analysis,

result, and implication. In this paper, we have used the descriptive approach by using academic references to clarify the terms theoretically and the analytical approach by making a sample survey and analyzing the results statistically.

Based on previous literature, regarded BI was operationalized utilizing the applications and techniques for collecting, accessing, and analyzing large amounts of data for the organization to make effective decisions (Wang & Wang, 2008). But thanks to technological advances such as cloud computing and software as a service, more and more small firms are taking advantage of the affordable options offered today as mentioned by several studies in literature. At the same time, regarded KM processes were operationalized utilizing the measuring of our factors in the previous research. The scales of knowledge acquisition, discovery, and use adopted from the study by Brahami et al. (2020). The variable of Business Intelligence (Data warehouse, Data mining, and Dashboard) was adapted from the studies by Sabri et al. (2017), and sustainability performance was operationalized using the measurement developed by items from Soltani & Navimipour (2018). Hence, the current study employed the instrument that was used by (30 items). All items were rated on a five-point Likert scale (1=strongly disagree, and 5= strongly agree).

To investigate hypotheses for this research, we applied a standardized questionnaire as the major tool of data collection. In this sense, an explanatory research design had been used to explain the relationship between KM, BI on sustainability performance among the tourism industry in Algeria. Therefore, we choose to base our empirical study on the Algerian Hotels sector, which has been relatively little studied. For the purpose of this study, we selected hotels with 3, 4, and 5 stars of Oran city since these hotels are more likely to use KM strategies and BI strategies on sustainability performance. The choice of this class of hotels is because customers look for an offer and a dissimilar service compared with other less-starred hotels. We also tried to make our sample geographically representative by selecting 3-5 stars hotels according to the geographical distribution. A quota sample was selected randomly. The target respondents were hotel general managers, senior managers, and all administrative levels (senior management, administrative level, and operational level). A self-administered questionnaire was applied using in-person questionnaires (90 questionnaires) and mail questionnaires (55 questionnaires). In order to increase the response rate of mail questionnaires, a contact by Smartphone application was used to explain the purpose of the study and to motivate potential respondents to fill the questionnaires. This study processed the collected data and analyzed it by applying the analytical tool, a software package called the Statistical Package for the Social Sciences (SPSS-V-23). After retrieving the questionnaire, it was found that the valid questionnaires for statistical analysis are (126) or 86.8%. As a preliminary, we present the demographic characteristics of respondents. The results are summarized in Table 1.

As it is shown in Table 1, 30.2 percent (n= 38) of the respondents are male, while 69.8 percent (n = 88) of the respondents are female. Regarding to the age composition of the respondents, the largest number of the respondents 78 (61.9 percent) is in the age group of 20 to 29 years; the second largest group 38 (30.2 percent) are those aged between 30 to 39 years, of the total respondents 10 (07.9 percent) indicated that they are in the age group of 50 years and above. Thus, the majority respondents of this study are female with ages ranging between 20 to 29 years old. The educational background of respondents as shown in Table 1, reveals that the largest group of respondents 86 (59.4 percent) are Tourism Higher School diploma holders, the next largest group 27 (21.4 percent) are holds Masters' Degree or Ph.D followed by those hold either Professional Qualifications 13 (10.3 percent). Therefore, most of the respondents have tourism higher school degree as their highest level of education. Regarding the marital status of the respondents, 77 respondents presenting about 61.2 percent of the total are married, while about 29.3 percent (n= 37) are single. Out of the total respondents 12 (09.5 percent) indicated that they have been divorced.

Table 1 Demographic Characteristics of Respondents

Variable	Category	Frequency	Percentage (%)
Gender	Male	38	30.2
	Female	88	69.8
	Total	126	100
Age	20 years – 29 years	78	61.9%
	30 years – 39 years	38	30.2
	40 years – 49 years	10	07.9
	50 years and above	Nil	Nil
	Total	126	100
Educational Qualification	Tourism Higher School Diploma	86	68.3
	Professional Qualifications	13	10.3
	Masters' Degree /Ph.D	27	21.4
	Total	126	100
Marital Status	Single	37	29.3%
	Married	77	61.2
	Divorced	12	9.5
	Others	Nil	Nil
	Total	126	100
Family Size	Less than 5	63	50
	5 – 8	63	50
	More than 8	Nil	Nil
	Total	126	100
Number of dependents	1 – 3	90	71.4
	4 – 6	25	19.9
	7 and above	11	08.7
	Total	126	100

In order to achieve the purpose and even the objective of the study, a questionnaire was used as a major tool for collecting data on independent and dependent variables. The first part presents the demographic characteristics of the sample of the study (gender, educational level, administrative level, and practical experience). The second part deals with the categories of the independent variables; Business Intelligence Systems (Data warehouse, Data mining, and Dashboard), Knowledge Management Processes (Knowledge acquisition, Knowledge discovery, and Knowledge using), and Sustainability Performance (Economic Performance, Social Performance, Environmental). In measuring the variables, we adopted the five-point Likert scales ranging from (1=strongly disagree, and, 5=strongly agree). The questionnaire includes 50 items to measure the proposed model constructs that we have selected from preceding empirical research. In our research context, minor modifications were made to these items to fit the tourism industry in Algeria. Furthermore, the measurements were adapted from previous studies. In addition, the variable of Business intelligence systems (Data Warehouse, Data Mining, and Dashboard) was adapted from the studies by Abdeldjouad et al. 2020; Sabri et al. 2017; Herison & Azman, 2017; Eidizadeh et al. 2017). The dimensions of Knowledge Management Process (Knowledge Acquisition, Knowledge Discovery, Knowledge Using) were adapted from the studies by (Brahami et al. 2020; Brahami & Matta, 2019; Brahami et al. 2018), and Sustainability Performance (Economic

Performance, Social Performance, Environmental) was adapted from the studies by (Muchran, 2020; Manzoor et al. 2019; Franzoni, 2015).

As per our objective, the questionnaire was presented to a group of experts consisting of (06) faculty members in the field of knowledge management and business intelligence to verify the stability of the questionnaire by using the internal consistency measurement of Cronbach's α to measure the strength of correlation and cohesion between the paragraphs whose objective of test the reliability of the data collection tool used to measure the variables included in the study. In this context, several researchers indicate that studies Cronbach's alpha coefficients above .70 of a scale. Besides, the researcher suggests that a Cronbach's alpha slightly lower than .60 is considered to be poor and those in the .70 are acceptable and those over .80 are good. In this study, the value of Cronbach's α was higher than 70% which is acceptable (See Table 2).

Table 2 Cronbach's Alpha for all the variables

Factors		Number of items	Cronbach's Alpha
Knowledge Management	Knowledge acquisition	9	.856
	Knowledge discovery	8	.832
	Knowledge using	8	.865
Business Intelligence	Data warehouse	9	.8793
	Data mining	9	.812
	Dashboard	7	.804
Sustainability Performance	Economic Performance	-	.791
	Social Performance	-	.786
	Environmental	-	.779

RESULTS AND DISCUSSION

The table below (See Table 3) shows presents a description of the study variables. The mean and standard deviations of the responses were calculated to determine the degree of approval and to determine the relative importance of each paragraph.

Table 3 Mean and standard deviation of the research's Variables

Type of Variable	Variables	Mean	Standard Deviation	Order
Independent Variables	Knowledge acquisition	3.85	0.935	3
	Knowledge discovery	4.15	0.866	1
	Knowledge using	4.03	0.832	2
	Data warehouse	4.09	0.800	1
	Data mining	4.07	0.857	2
	Dashboard	3.93	0.843	3
Dependent Variable	Sustainability performance	3.88	0.908	1

Based on the findings of results, and according to Table 3, the results of the data analysis showed that there was a clear interest in applying knowledge management processes to a large extent in the Algerian Hotels sector where the mean was 4.01. Indeed, this indicator points to the importance of KM processes and the role of managers in the direction of knowledge creation, organization, storage, and sharing. This high level of supply demonstrates a positive attitude towards KM processes. Besides, we are found that the Algerian hotels have a great interest in the use of advanced information technology such as business intelligence, especially data warehousing, data mining, and dashboard because it helps trades' actors (employees) at all levels of management make decisions quickly and thus improve the sustainability performance (economic, social, and environmental) of the hotels.

For bivariate analysis, Pearson product-based correlation was carried out to determine the relationships between all variables, as well as separately for each scale. The same rule was applied for regression analysis to predict the influence of independent variable on the dependent variable. Similarly, t-tests were conducted to analyze the potential impacts of the independent variables on the dependent variables. As shown in Table 4 dependent variable was significantly and positively correlated with the eight dimensions of the independent variable, namely Knowledge Acquisition (r=.735**, p=.000), Knowledge Discovery (r=.745**, p=.000), Knowledge Using (r=.723**, p=.000), Data warehouse (r=.747**, p=.000), Data mining (r=.739**, p=.000), Dashboard (r=.809**, p=.000). Moreover, there were significant correlations among the independent variables.

Table 4 Correlation matrix of research variables

Sr.	Variable	KA	KD	KU	DW	DM	Dash	SP
1	Knowledge Acquisition (KA)	1.0						
2	Knowledge Discovery (KD)	.653**	1.0					
3	Knowledge Using (KU)	.694**	707**	1.0				
4	Data Warehouse (DW)	.635**	.595**	.657**	1.0			
5	Data Mining (DM)	.562**	.665**	.563**	.709**	1.0		
6	Dashboard (Dash)	.662	.598**	.662**	.697**	.657**	1.0	
7	Sustainability performance (SP)	.735**	.745**	.723**	.747**	.739**	.809**	1.0

In contrast, factor analysis on dimensions was applied to check for the validity of the instrument and variables comprising the scale of measurement. As per our objective, Kaiser-Mayer-Olkin (KMO) and Bartlett's Measure of Sampling Adequacy of (0.70) and test of Sphericity was applied on all scales. For this, all the scales confirmed well above the required standard. Likewise, unrotated factor solutions, Scree Plot, and Varimax Rotation under Principal Components Analysis were applied. All the scales confirmed the required standards.

In order to answer the research question that addresses the relationship between Business Intelligence (Data warehouse, Data mining, and Dashboard), and Knowledge Management (Knowledge acquisition, Knowledge discovery, and Knowledge using) on Sustainability Performance (Economic Performance, Social Performance, Environmental) in the tourism industry in Algeria. Regression analysis was conducted to test the hypothesis (H1 and H2) using Partial least squares (PLS) tool (SmartPLS3). In this analysis, the level of significance (α level) was chosen to be (0.05) and the probability value (p-value) obtained from the statistical

hypotheses test is considered to be the decision rule for rejecting the null hypotheses. Therefore, the researchers hypothesized that:

H1. There is statistically a significant relationship (at the level (≤α 0.05)) between Business Intelligence (Data warehouse, Data mining, and Dashboard) and Sustainability Performance (SP).

H2. There is statistically a significant relationship (at the level (≤α 0.05)) between Knowledge Management (Knowledge acquisition, Knowledge discovery, and Knowledge using) and Sustainability Performance (SP).

In the context mentioned above, the results of the set of regression are reported in Table 5. The results of the study indicate that the effect of the business intelligence systems on all its components on the dependent variable (sustainability performance) is positive and statistically significant. The calculated F value is 65.193 and Sig F = 0.002, is less than 0.05. Furthermore, the coefficient of correlation (R = 0.643) indicates the positive relationship between the business intelligence systems and the elements of sustainability performance (economic, social, and environmental). Moreover, the value of the coefficient of selection was R^2 = 0.401, which indicates that 40.1% of the variation in sustainability performance can be explained by business intelligence at the tourism industry in Algeria. Likewise, the data regression coefficient is 0.387 (β), which indicates the direct effect of the Data warehouse on the sustainability performance of the tourism sectors which is significant, where the value of t is (4.465) and the level of significance (Sig = 0.000) is less than (0.05), and the regression coefficient of the variable Data mining = 0.356 (β). It indicates the direct effect of Data mining on the sustainability performance of the tourism sectors which is significant, where the value of t is 3.673 and the level of significance is (Sig = 0.000), less than (0.05) Dashboard = 0.403 (β). It indicates the direct effect of Dashboard on the sustainability performance of the tourism sectors which is significant, where the value of t is (3.530) and the level of significance (Sig = 0.000) is less than (0.05).

Table 5 Multiple Regression of the Hypothesis "H1"

Coefficients[b]					
Business Intelligence	Unstandardized Coefficients		Standardized Coefficients	T	Sig t*
	B	Std. Error	Beta (β)		
Data warehouse	0.309	0.029	0.387	4.465	0.002
Data mining	0.365	0.072	0.356	3.673	0.000
Dashboard	0.337	0.035	0.402	3.389	0.000

R = 0.643; R^2 = 0.401; F = 65.193; Sig. F* = 0.000

Note. The impact is statistically significant at level (≤α 0.05)

a. Predictors: (Constant), Data warehouse, Data mining, and Dashboard

b. Dependent variable: Sustainability Performance

As shown in Table 6, the results indicate that the effect of the knowledge management processes on all operations on the dependent variable (Sustainability Performance) is statistically significant. The calculated F value is 62.176 and the level of significance (Sig F = 0.000) is less than 0.05, the correlation coefficient (R = 0.659) indicates the positive relationship between the knowledge management processes in all its operations and sustainability performance. As well, the value of the coefficient of selection was (R^2 = 0.443), which indicates that 44.3% of the variation in sustainability performance can be explained by the variation in knowledge management and the three processes mentioned before.

Indeed, the regression coefficient of the variable knowledge acquisition is 0.353 (β). It refers to the direct effect of knowledge acquisition on the sustainability performance which is significant, where the value of t is 3.487 at a significant level (Sig = 0.000), which is less than (0.05). Likewise, the regression coefficient of the variable knowledge discovery = 0.398 (β) indicates the direct impact of knowledge discovery on the sustainability performance which has a significant effect, where the value of t is (3.371) and the level of significance (Sig = 0.000) is less than (0.05). For the regression coefficient, knowledge utilization = 0.367 (β) indicates the direct effect of knowledge utilization on sustainability performance, which has a significant effect, where (t) has a value of 3.389 and a level of significance (Sig = 0.000<0.05).

Table 6 Multiple Regression of the Hypothesis "H2"

Coefficients[b]					
Knowledge management	Unstandardized Coefficients		Standardized Coefficients	T	Sig t*
	B	Std. Error	Beta (β)		
Knowledge Acquisition	0.285	0.021	0.353	3.487	0.002
Knowledge Discovery	0.276	0.017	0.398	3.371	0.000
Knowledge Using	0.275	0.016	0.367	3.389	0.000

$R = 0.659$; $R^2 = 0.443$; $F = 62.176$; Sig F* = 0.000
Note. The impact is statistically significant at level (≤α 0.05)
a. Predictors: (Constant), Knowledge Acquisition, Knowledge Discovery, Knowledge Using
b. Dependent variable: Sustainability Performance.

The main aim of research in this study is to investigate the impact of Business intelligence (Data warehouse, Data mining, and Dashboard) and Knowledge management (Knowledge acquisition, Knowledge discovery, and Knowledge using) on Sustainability Performance in the tourism industry in Algeria. To do that, we have used multiple regression analysis to examine the hypotheses (H1 and H2) connected with this study.

In the hypothesis, H1 context of this research, this study contributes to the literature by providing detailed information about the analysis carried out for the current research and attentively the contribution of our current work. Additionally, the results of this work are consistent with previous works namely (Brahami et al., 2020; Marta et al. 2018), noting that tourist organizations that encourage their employees to create, storage, transfer, and apply new knowledge perform better. Likewise, an effective knowledge management process application gives organizations the ability to learn quickly in order to achieve better strategic potential and to enhance competitive advantage, and improve creativity and effective and innovative long-term sustainability performance. At the same time, the knowledge management process has become an important part of the organization's strategy, as it can support the organization's strategic decisions and thus enhancing competitiveness. Interestingly, the results of the study demonstrate that this knowledge (tacit and explicit) significantly and positively affects processes of knowledge acquisition, discovery, sharing, and application in order to achieve sustainable performance. In summary, managers should remove all potential barriers to knowledge acquisition, discovery, sharing, and facilitate collaboration and networking for knowledge application to achieve sustainable performance and engage in creating and maintaining a supportive work environment where employees are motivated to apply and implement knowledge in their work.

In the hypothesis H2 context of this research, the result of this work is consistent with the results of most of the previous studies namely (Ahmad, 2015; Grecu & Nate, 2014; Popovič & Oliveira, 2019). Currently, the importance of data in various sizes and types in business as an important factor is visible to trade actors. Business Intelligence is a set of tools, technologies, and processes in order to transform data into information and to required knowledge for improving decision making for business processing. Furthermore, business intelligence and sustainable development each represent relevant research themes by using software applications that can help organizations to calculate their sustainability index and this may help them to focus more on sustainable development. Likewise, the results of these analyses are used to make strategic decisions of the tourism sector that lead to the development of the sustainability performance regularly to analyze monitor the activities of competitors and conditions. In other words, business intelligence can dramatically improve a company's position in the marketplace competitors with the benefit of data integration and forecasting capabilities. Besides, business intelligence is used to support internal processes of the tourism sector, such as project management, services, and quality assurance (Farzaneh et al. 2018). In summary, business intelligence and data integration capabilities enable new knowledge creation and reinforce the predictive capabilities by advanced analytical in order to identify deficiencies in the main operations namely the overall performance (Audzeyeva & Hudson, 2016).

CONCLUSION

Most academic researchers and practitioners agreed on the practical implication of knowledge (tacit and explicit) as one of the important assets of any organization by using groupware technologies, social networking, and e-learning. Besides that, growing concern about the excessive consumption of resources, and social inequalities have given rise to urgent calls for governments to apply actions and measures that enable a transition towards a more sustainable society and economy. For this reason, it is necessary to implement knowledge management practices so that the competitive culture, discovery, evaluation, and use of knowledge will take place adequately. Likewise, and from a decision-making perspective, BI assists organizations in corporate performance management; optimizing customer relations, monitoring business activity, and traditional decision support. In this context, the study has presented theoretical implications in the tourism industry in Algeria and presented the studies that have examined the impact of the knowledge management process and intellectual capital on sustainability performance and other studies that examined the relationship between business intelligence systems and its impact on sustainability performance. In the meanwhile, it has been noted that rare studies examined the relationship between knowledge management practices and business intelligence systems together and their impact on sustainability performance in the Algerian tourism industry environment. Therefore, this study was important to deal with these hurdles because the tourism sites, especially the mountains, the desert, the ancient monuments in Algeria which are facing high competition in the development of knowledge management and operations through its attempt to generate new knowledge, application, and sharing in order to develop its sustainability performance that leads to global performance. In summary, the importance of managing these intangible assets and data analytical to improve environmental performance is heightened in the tourism sector. Based on the analysis, which was presented in the previous section, tourism professionals, responsible, and governments who have a desire to develop sustainable tourism should quickly adopt and use business intelligence. Moreover, BI focuses on explicit knowledge, but KM encompasses both tacit and explicit knowledge. Both concepts promote learning, decision-making, understanding, and sustainable development. Ideally, this explicit information will be blended and integrated with the data and techniques used in BI to provide a richer view of the decision-making problem sets and alternative solution scenarios.

This study's limitations presented open avenues for further investigation in this area. Firstly, data collected from respondents were subject to certain errors as the respondents tried to modify the actual results due to issues of privacy and due to non-disclosure agreements signed with their parent organizations. Secondly, data was gathered only from tourism organizations in Algeria. Future research may consider collecting data across different sectors (private) and regions to test, validate, and examine the high-performance model developed in this research study. Secondly, we tested our hypotheses in the tourism industry in Algeria. Similar studies can be carried out in other sectors namely healthcare, telecommunication, industry, and pharmaceutical in order to generalize the findings of this study. Thirdly, the present study considers only two mediator variables namely business intelligence and knowledge management. In the future, more mediating variables, e.g. innovation, competitive advantage, and organizational culture that foster sustainability and organizational performance need to be examined. Finally, this study was limited to investigating three KM dimensions, therefore, future studies may consider other dimensions namely knowledge storage, knowledge mapping, and knowledge sharing as well as other BI dimensions as Data Sources Integration, Online Analytical Processing (OLAP), Data Marts, Reporting, and Analytics.

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REFERENCES

Abdeldjouad, F. Z., Brahami, M., & Matta, N. (2020). A hybrid approach for heart disease diagnosis and prediction using machine learning techniques. In *The Impact of Digital Technologies on Public Health in Developed and Developing Countries: 18th International Conference, ICOST 2020, Hammamet, Tunisia, June 24–26, 2020, Proceedings 18 (pp. 299-306)*. Springer International Publishing. DOI: 10.1007/978-3-030-51517-1_26

Ahmad, A. (2015). Business Intelligence for Sustainable Competitive Advantage. *Advances in Business Marketing and Purchasing, 22*, 3-220. DOI:10.1108/S1069-096420150000022014

Akbaba, A. (2006). Measuring Service Quality in the Hotel Industry: A study in a Business Hotel in Turkey. *International Journal of Hospitality Management, 25*(2), 170–192. doi:10.1016/j.ijhm.2005.08.006

Ali Akasha, A. M., Albattat, A., & Tham, J. (2020). Tourism Marketing And Perceived Risks Impact On Attracting Libyan Local Tourists. *International Journal of Scientific & Technology Research, 9*(8), 336–346.

Albrecht, N. J. (2014). Micro-mobility Patterns and Service Blueprints as Foundations for Visitor Management Planning. *Journal of Sustainable Tourism, 22*(7), 1052–1070. DOI:10.1080/09669582.2013.847945

Avdimiotis, S. (2019). Emotional Intelligence and Tacit Knowledge Management in Hospitality. *Journal of Tourism, Heritage & Services Marketing, Tourlab, the International Hellenic University, 5*(2), 3–10. doi: 10.5281/zenodo.3601651.

Audzeyeva, A., & Hudson, R. S. (2016). How to get the most from a Business Intelligence Application during the Post Implementation Phase? Deep Structure Transformation at a UK retail bank. *European Journal of Information Systems, 25*(1), 29–46. doi:10.1057/ejis.2014.44

Azeroual, O., & Theel, H. (2018). The Effects of Using Business Intelligence Systems on an Excellence Management and Decision-Making Process by Start-up Companies: A Case Study. *International Journal of Management Science and Business Administration, 4*(3), 30–40. doi:10.18775/ijmsba.1849-5664-5419.2014.43.1004

Baker, M., & Mearns, K. (2017). Applying Sustainable Tourism Indicators to Measure the Sustainability Performance of two Tourism Lodges in the Namib Desert. *African Journal of Hospitality, Tourism and Leisure, 6*(2), 1-22.

Brahami, M., Sabri, M., & Matta, N. (2020). Towards a Model to Improve Boolean Knowledge Mapping by Using Text Mining and Its Applications: Case Study in Healthcare. *International Journal of Information Retrieval Research, 10*(3), 40–58. doi: 10.4018/IJIRR.2020070103.

Brahami, M., Adjaine, M., & Matta, N. (2020). The Influences of Knowledge Management and Customer Relationship Management to Improve Hotels Performance: A Case Study in Hotel Sector. *Information Resources Management Journal, 33*(4), 74–93. doi: 10.4018/IRMJ.2020100105.

Brahami, M., & Matta, N. (2019). The Relationship Between Knowledge Mapping and the Open Innovation Process: the Case of Education System. *Artificial intelligence for engineering design analysis and manufacturing, 33*(4), 1–13. doi: 10.1017/S0890060419000325.

Brahami, M., & Matta, N. (2018). A model to reduce the Risk of Projects guided by the Knowledge Management Process – Application on Industrial Services. *International Journal of Information Systems in the Service Sector, 10*(2), 2–18.

Belias, D., Rossidis, L., Velissariou, E., Amoiradis, C., Tsiotas, D., & Sdrolias, L. (2018). Successful and Efficient Knowledge Management in the Greek Hospitality Industry: Change the Perspective!. *Academic Journal of Interdisciplinary Studies, 7*(1), 185–191. doi: 10.2478/ajis-2018-0019.

Brandão, F., Costa, C., Breda, Z., & Costa, R. (2019). Knowledge creation and transfer in tourism innovation networks. In *Advances in Tourism, Technology and Smart Systems: Proceedings of ICOTTS 2019 (pp. 275-287)*. Singapore: Springer Singapore. doi:10.1007/978-981-15-2024-2_25

Cooper, C. (2006). Knowledge Management and Tourism. *Annals of Tourism Research, 33*(1), 47–64. doi: 10.1016/j.annals.2005.04.005.

Dedić, N., & Stanier, C. (2016). *Measuring the Success of Changes to Existing Business Intelligence Solutions to improve Business Intelligence Reporting*. International Conference on Research and Practical Issues of Enterprise Information Systems. Lecture Notes in Business Information Processing, Springer International Publishing, 268, 225–236. Doi: 10.1007/978-3-319-49944-4_17

Ermine, J-L., Boughzala, I., & Tounkara, T. (2010). Critical Knowledge Map as a Decision Tool for Knowledge Transfer Actions. *Electronic Journal of Knowledge Management, 4*(2), 129–140. http://www.ejkm.com.

Eidizadeh, R., Salehzadeh, R., & Chitsaz, E. A. (2017). Analyzing the role of Business Intelligence, Knowledge Sharing and Organisational Innovation on Gaining Competitive Advantage. *Journal of Workplace Learning, 29*(4), 250–267. doi.10.1108/JWL-07-2016-0070

Elmo, G., Chiara, A., Gabriella, V., M., Poponi, S., & Francesco, P. (2020). Sustainability in Tourism as an Innovation Driver: An Analysis of Family Business Reality. *Sustainability 12*(6149), 1–14. doi:10.3390/su12156149

Farzaneh, M., Isaai, M. T., Arasti, M. R., & Mehralian, G. (2018). A Framework for Developing Business Intelligence Systems: A Knowledge Perspective. *Management Research Review, 41*(12), 1358–1374. Doi: 10.1108/MRR-01-2018-0007

Franzoni, S. (2015). Measuring the Sustainability Performance of the Tourism Sector. *Tourism Management Perspectives, 16*, 22–27. doi.10.1016/j.tmp.2015.05.007

Grecu, V., & Nate, S. (2014). Managing Sustainability with Eco-Business Intelligence Instruments. *Management for Sustainable Development,* 6(1), 25–30. doi: 10.2478/msd-2014-0003

Handzic, M., & Durmic, N. (2015). Knowledge Management, Intellectual Capital and Project Management: Connecting the Dots. *The Electronic Journal of Knowledge Management, 13*(1), 51–61.

Hallin, C. A., & Marnburg, E. (2008). Knowledge Management in the Hospitality Industry: A review of Empirical Research. *Tourism Management, 29*(2), 366–381. doi:10.1016/j.tourman.2007.02.019.

Haupt, R., Scholtz, B., & Calitz, A. (2015). *Using Business Intelligence to Support Strategic Sustainability Information Management*. In proceedings of the 2015 Annual Research Conference on South African Institute of Computer Scientists and Information Technologists, 1–11. doi:10.1145/2815782.2815795.

Herison, S., & Azman, T. (2017). *Managing Knowledge Business Intelligence: A Cognitive Analytic Approach*. In proceedings of the 2nd International Conference on Applied Science and Technology 2017 (ICAST'17), 1–6. doi:10.1063/1.5005468

Höpken, W., Keil, D., Fuchs, M., & Lexhagen, M. (2015). Business Intelligence for cross-process Knowledge Extraction at Tourism Destinations. *Information Technology & Tourism, 15*(2), 101–130. doi:10.1007/s40558-015-0023-2

Jia, Z., Shi, Y., Jia, Y., & Li, D. (2012). A Framework of Knowledge Management Systems for Tourism Crisis Management. In: International Workshop on Information and Electronics Engineering (IWIEE'2012). Published in: *Procedia Engineering, 29*. 138–143. doi:10.1016/j.proeng.2011.12.683

Jennex, M. E. (2005). What is knowledge management?. *International Journal of Knowledge Management, 1*(4), i-iv.

Kianto, A., Sáenz, J., & Aramburu, N. (2017). Knowledge-based Human Resource Management Practices, Intellectual Capital and Innovation. *Journal of Business Research, 81*, 11–20. doi: 10.1016/j.jbusres.2017.07.018.

Kharel, S., Rai, R., & Bhandari, U. (2019). Tourism entrepreneurs' awareness level of Knowledge Management: A literature review. *Quest Journal of Management and Social Sciences, 1*(2), 260–271. doi:10.3126/qjmss.v1i2.27444.

Khadivar, A., Abdolvand, N., & Nazari, S. L. (2016). A Model for Analyzing the Barriers of Implementing Business Intelligence (BI) in the Tourism Industry of Iran, A Mixed Method Approach. *Modern Researches in Decision Making, 1*(1), 71–91. doi: 10.5281/zenodo.3346587

Kimball, R., & Ross, M. (2016). *The Kimball group reader – Relentlessly practical tools for Data Warehousing and Business Intelligence*. (2nd ed.), Indianapolis, John Wiley and Sons.

Laitamaki, J., Hechavarría, L. T., Tada, M., Liu, S., Setyady, N., Vatcharasoontorn, N., & Zheng, F. (2016). Sustainable Tourism Development Frameworks and Best Practices: Implications for the Cuban Tourism Industry. *Managing Global Transitions, 14*(1), 7–29.

Lopes, J., & Farinha, L. (2020). *Knowledge and Technology Transfer in Tourism SMEs.* In the book: Multilevel Approach to Competitiveness in the Global Tourism Industry. Chapter 12, 189–210. doi: 10.4018/978-1-7998-0365-2.ch012

Manzoor, Ul. A., Chauhan, C., Ghosh, K., & Singh, A. (2019). Knowledge Management, Sustainable Business Performance and Empowering Leadership: A Firm-Level Approach. *International Journal of Knowledge Management, 15*(2), 20–35. doi: 10.4018/IJKM.2019040102

Mariani, M. M., Baggio, R., Fuchs, M., & Höpken, W. (2018). Business Intelligence and Big Data in Hospitality and Tourism: A Systematic Literature Review. *International Journal of Contemporary Hospitality Management, 30*(12), 1–47. doi: 10.1108/IJCHM-07-2017-0461

Marta, B., Josune, S., Aino, K. (2018). Knowledge Management Strategies, Intellectual Capital, and Innovation Performance: A Comparison between high and low-tech Firms. *Journal of Knowledge Management, 22*(4), 1-22. doi: 10.1108/JKM-04-2017-0150

Mistilis, N., & Sheldon, P. (2006). Knowledge Management for Tourism Crises and Disasters. *Tourism Review International, 10*(1/2), 39–46.

Mian, A., Petri, H., & Tauno, K. (2010). Critical Factors for Knowledge Management in Project Business. *Journal of Knowledge Management, 14*(1), 156–168. doi:10.1108/13673271011015633

Muchran, M. (2020). Effect of Intellectual Capital on Sustainable Financial Performance of Indonesian Pharmaceutical Firms with Moderating Role Knowledge Management. *Systematic Review Pharmacy, 11*(1), 203–212. doi: 10.5530/srp.2020.1.27.

Nguyen, L., & Kohda, Y. (2017). Toward a Knowledge Management Framework for Auditing Processes. *International Journal of Knowledge and Systems Science, 8*(3), 45–55. doi:10.4018/IJKSS.2017070104

Pejić, B. M., & Vugec, D. (2018). Understanding impact of Business Intelligence to Organizational Performance using Cluster Analysis: does Culture Matter?. *International Journal of Information Systems and Project Management, 6*(3), 63–86. doi: 10.12821/ijispm060304

Petrini, M., & Pozzebon, M. (2009). Managing Sustainability with the support of Business Intelligence: Integrating Socio-Environmental Indicators and Organizational Context. *The Journal of Strategic Information Systems, 18*(4), 178–191. doi: 10.1016/j.jsis.2009.06.001

Porter, E. M., & Kramer, R. M. (2011). The Big Idea: Creating Shared Value. How to Reinvent Capitalism—and Unleash a Wave of Innovation and Growth. *Harvard business review, 89*(1-2), 62–77.

Popovič A. P. B., & Oliveira, T. (2019). Justifying Business Intelligence Systems Adoption in SMEs: Impact of Systems use on Firm Performance. *Industrial Management & Data Systems, 119*(1), 210–228. doi: 10.1108/IMDS-02-2018-0085

Ritsri, U., & Meeprom, S. (2019). Does Knowledge Management Practice Produce Accounting Employee Productivity in the Tourism Business in Thailand?. *Anatolia, 31*(1), 99–110, doi:10.1080/13032917.2019.1708424

Rodríguez-Díaz, M., & Espino-Rodríguez, T. (2016). Determining the Sustainability Factors and Performance of a Tourism Destination from the Stakeholders' Perspective. *Sustainability, 8*(9), 1–17. doi:10.3390/su8090951

Sabri, M., Brahami, M., Rahal, S. A., & Matta, N. (2017). *Epidemiological Knowledge Mapping since the Integrating Heterogeneous Data until the Service-Oriented Data Mining Platfo*rm. In: The 5th International Conference on Control Engineering &Information Technology. Book of proceeding of Engineering and Technology –PET 32, 1–10. http://ipco-co.com/PET_Journal/Volume32_CEIT_2017.html

Soltani, Z., & Navimipour, N. J. (2016). Customer Relationship Management Mechanisms: A Systematic review of the state of the Art Literature and Recommendations for Future Research. *Computers in Human Behavior, 61*, 667–688. doi:10.1016/j.chb.2016.03.008

Shahbudin, A. M. N., & Amran, A. (2011). Sustainability-based Knowledge Management Performance Evaluation System (SKMPES): Linking the Higher Learning Institutes with the Bottom Billions. *African Journal of Business Management, 5*(22), 9530–9540. doi:10.5897/AJBM.9000537

Scholtz, B. C. A., & Haupt, R. (2018). A Business Intelligence Framework for Sustainability Information Management in Higher Education. *International Journal of Sustainability in Higher Education, 19*(2), 266–290. doi:10.1108/ijshe-06-2016-0118

Strand, M., & Syberfeldt, A. (2020). Using External Data in a BI Solution to Optimise Waste Management. *Journal of Decision Systems, 29*(1), 53–68. doi:10.1080/12460125.2020.1732174

Torres-Delgado, A., & Saarinen, J. (2013). Using Indicators to Assess Sustainable Tourism Development: A Review. *Tourism Geographies: An International Journal of Tourism Space, Place and Environment, 16*(1), 1–17. doi:10.1080/14616688.2013.867530

United Nations Environment Programme (UNEP) & World Trade Organization (WTO) (2005). *Making Tourism more Sustainable: A Guide for Policy Makers*. https://wedocs.unep.org/20.500.11822/8741.

Wang, J., & Ren, H. (2013). The User Requirement Survey and Analysis System of Knowledge Management for Laboratories in Universities. *International Journal of Knowledge and Systems Science, 4*(2), 26–34. doi: 10.4018/jkss.2013040103

Wang, H., & Wang, S. (2008). A Knowledge Management Approach to Data Mining Process for Business Intelligence. *Industrial Management & Data Systems, 108*(5), 622–634. doi: 10.1108/02635570810876750

Wu, J., & Haasis, D. (2013). Converting Knowledge into Sustainability Performance of Freight Villages. *Logistics Research, 6*(2–3), 63–88.

Yoopetch, C., & Nimsai, S. (2019). Science Mapping the Knowledge Base on Sustainable Tourism Development, 1990–2018. *Sustainability, 11*(3631), 1–27. doi:10.3390/su11133631

Zaei, E. M., & Zaei, E. M. (2014). Knowledge Management in Hospitality and Tourism Industry: A KM Research Perspective. *Information and Knowledge Management, 4*(9), 114–122.

Zolfani, S. H., Sedaghat, M. M., & Zavadskas, E. (2015). Sustainable Tourism: A Comprehensive Literature Review on Frameworks and Applications. *Economic Research, 28*(1), 1–30. doi:10.1080/1331677X.2014.995895