

The Impact of Big Data on Competitive Advantage in Jordanian Tourism and Travel Offices and Companies

Mahmoud Barakat Alnawaiseh

Business Department, School of Business, University of Jordan/Aqaba

Email: m.alnawaiseh@ju.edu.jo

Khaled Mahmoud Alshawabkeh

Management Department, Business and finance Faculty, The world Islamic Science and Education University (WISE), Amman, Jordan

Email: Khaled.alshawabka@wise.edu.jo

To Link this Article: <http://dx.doi.org/10.6007/IJARBS/v13-i8/17624> DOI:10.6007/IJARBS/v13-i8/17624

Published Date: 19 August 2023

Abstract

This study aimed to clarify the impact of big data on competitive advantage in Jordanian travel and tourism offices and companies. The study relied on the big data analysis dimension, while four dimensions were adopted to measure competitive advantage: growth, flexibility, cost, and innovation. This study was conducted on the Jordanian tourism and travel companies and offices, which numbered (314) offices and companies, the researchers used a proportional stratified random sample, and the sample size was (167). The study found high levels of application of big data and competitive advantage by Jordanian travel and tourism offices and companies. The results of the study also indicated that there is a statistically significant effect of big data on competitive advantage. The researchers presented a set of recommendations that can help Jordanian travel and tourism offices and companies in increasing interest in big data as well as achieving competitive advantage.

Keyword: Big Data, Competitive Advantage, Tourism and Travel Offices and Companies, Jordan

Introduction

Technological progress and communication development in this era require companies and organizations to maintain a competitive advantage through innovation, development, and strategic formulation. This ability to position themselves among competitors and customers sets them apart from competitors. Porter (1998) pointed out that competitive advantage has specific characteristics in which the company differs from similar companies operating in the same sector, and the degree of difference is the company's ability to satisfy the individual needs of market stakeholders.

Due to the importance of big data, which has become considered an asset of the organization's basic resources (Li & Law, 2020). Organizations aim to collect, store, and train employees to handle data effectively, resulting in improved performance and faster response to customer and market requirements. This leads to a competitive advantage (Omar, 2020). Big data has gained interest among business professionals, industry strategists, and marketing professionals due to its innovative ideas, increased production, and competitive processes. It enables companies to detect high-value data, predict, make decisions, and monitor progress towards achieving competitive advantage goals (Rashwan et al., 2021). Big data is important because it enables organizations to collect, store, manage and process vast amounts of data at the right speed, at the right time, to get the right insights (Hurwitz et al., 2013,10).

Big data analysis significantly impacts tourism and hospitality companies, increasing profitability and efficiency by processing accurate data and reshaping marketing strategies (Inanc–Demir & Kozak, 2019). Big data analytics support tourism analytics, tourism design, smart tourism, the tourism industry, and travelers by improving their ability to capture, analyze, and interpret data. These new tools will lead the tourism industry in the search for value generation, innovation, and destination management capability (Xiang & Fesenmaier, 2017).

Objective and Problem of Study

This study aims to Identify the impact of big data on competitive advantage in its dimensions (growth, flexibility, cost, and innovation) in Jordanian tourism and travel offices and companies.

Problem: The study focuses on the competitive advantage of Jordanian tourism and travel offices and companies in utilizing big data to enhance their competitiveness in the tourism market. The sector faces fierce competition and a decline in performance.

Literature Review

Big data constitutes a large part of the modern digital system, as it contains valuable and useful information that is used in the modern business environment, which helps improve the quality of decisions (Shamim et al., 2019).

Through the use of big data analytics, companies can detect high-value data capable of predicting, making decisions, and monitoring progress towards achieving competitive advantage goals (Rashwan et al., 2021). Big data is important because it enables organizations to collect, store, manage, and process vast amounts of data at the right speed and at the right time to get the right insights (Hurwitz et al., 2013,10).

Big data is an invaluable collection of information about customers, their needs, and behaviors obtained from legitimate sources, as these companies analyze the data collected by them through customer cookies, identify their needs, and prepare personalized offers for them (Bartosik-purgat & Ratajczak-mrozek, 2018). Gartner (2018) defined it as a large, fast-flowing, and diverse information asset that needs economically viable and innovative processing methods to develop insights, make decisions, and automate processes. There are many sources through which data can be obtained in order to do this, and there are three types of data that are processed by institutions and companies: structured data, unstructured data, and multi-structured data (Erl et al., 2016). Big data differs in nature with five characteristics that help improve decision-making as well as improve the success of new products (Erl et al., 2016; Li et al., 2018).

Competitive Advantage

Organizations face uncertainty and dynamism due to rapid development in various areas, particularly communications. Competitive advantage is crucial for survival and continuation, and organizations seek to maintain this position for as long as possible. Barney and Hesterly (2012,10) Competitive advantage is a company's ability to generate higher economic value than its competitors, calculated by dividing perceived benefits by the full economic cost of production and delivery. The size of a company's competitive advantage is determined by this difference (Grimm et al., 2006,13). The concept of competitive advantage varies according to the sector in which the organization or institution operates (Porter, 1985,53). Many researchers pointed to the importance of competitive advantage, some of them considered it in short the ability or unique location that the organization develops to outperform its competitors, and competitive advantage emerges from the value generation strategy, and there are two models in research areas that show where competitive advantage comes from, one of the typical areas examines the competitive advantage of the industrial level, which is represented by Porter's Five Forces model (Porter, 1985,53).

The other model examines competitive advantage from the organizational level, which is represented by a resource-based point of view as well as dynamic power forces (Teece et al., 1997). These two models provide a complete picture of how to gain and retain competitive advantage.

Porter also pointed out that companies seeking to achieve competitive advantage must provide special sources of competitive advantage, which are human resources, capital and raw materials, which do not represent a competitive element, as well as the second aspect, which is represented in intangible resources, which is the company's ability to innovate and create, as well as possess human skills that cannot be present in competitors. Wang et al (2011) pointed out that the most important intangible resources are technology and innovation, human resources, and organizational structure. Competitive advantage is a positive indicator of a company's ability to gain market share, customer loyalty, and sales volume without being affected by competitors' offers (Czepiel, 1992). Competitive advantage is the best way in which an organization manages the overall value system (Porter, 2012). Porter emphasized that understanding competitive advantage requires dividing an organization's activities separately. Sustainable competitive advantage involves organizations meeting customer needs by reducing prices, quality, and staying ahead of competitors.(Srivastava et al., 1998).

Big Data and Competitive Advantage.

Big data is crucial for organizations to achieve competitive advantage. Investing in databases, tools, and a data analysis team is essential to store and analyze useful data, preventing useless data and failure (Li & Law, 2020). Big data refers to intricate datasets from various sources, enabling firms to gain valuable insights for innovation, productivity, and customer focus (Chui et al., 2012; Hagi & Wright, 2020). A competitive advantage involves a business outperforming rivals through profitability, growth, customer satisfaction, and differentiation (Mikalef et al., 2020). Big data offers a sustainable competitive advantage from a resource-based perspective, making it rare and difficult for competitors to imitate or substitute (Shan et al., 2019). Horng et al (2022) He pointed out Big data analysis positively impacts competitive advantage.

H1: Big data positively impact on competitive advantage**Methodology**

This study used the quantitative (descriptive and analytical) approach, which is considered an illustrative study in terms of purpose, as well as an applied study in terms of methodology (Levy & Lemeshow, 2013; Sekaran & Bougie, 2016). The researchers relied on the method of random stratified sample proportional from Jordanian offices and travel companies for the purposes of representing the study population because this method is used in surveys and combines simplicity with increased reliability to represent the study population and to identify the characteristics of the phenomenon (Levy & Lemeshow, 2013,122). A questionnaire was designed to explore correlations between exogenous and endogenous constructs. It was developed by reviewing studies, and then adapted by academic experts, and translated into local language (Arabic), to increase potential respondent participation.

Data Analysis and Results

This study aims to examine the impact of big data on the competitive advantage of Jordanian tourism companies. Additionally, Given the tourism sector's keen interest in utilizing big data analytics, it was chosen as the population for the study. By leveraging customer-generated data, these companies can gain insights into their purchasing patterns and spending behaviors, ultimately allowing for improved customer categorization. The study collected data from 182 of tourism companies using a stratified simple random sample technique, the analysis unit consisted of all administrative employee in various businesses within the selected companies. The questionnaires were sent by handling to the respondents a total of 161 questionnaires were received and utilized for statistical analysis. The study aims was accomplished through the use of structural equation modelling partial least squares (SEM-PLS) utilizing the Smart-PLS .4 program.

Table 1

Displays the distribution of participants based on demographic and personal characteristics.

Demographic Characteristics		Frequency	Percentage (%)
Gender	Male	131	81.4
	Female	30	18.6
Age	30-20	43	26.7
	340-1	45	28
	41-50	71	44.1
	50 and above	2	1.2
Education Level	PhD	13	8.1
	Master	23	14.3
	Bachelor	110	68.3
	Diploma	15	9.3
Class Company	Outbound Tourism	64	46
	Inbound Tourism	59	38.6
	Hybrid	28	17.4

The Measurement Model Assessment

The validity of the study model was established through the assessment of convergent and discriminant validity in both the exogenous and endogenous constructs. Since all

measures were reflective, convergent validity was evaluated by verifying if average variance extracted (AVE) values exceeded the required threshold of 0.50 and if factor loadings were greater than or equal to 0.70, as suggested by numerous scholars (Fornell and Larcker, 1981; Hair et al., 2014, 2019). The study model's internal consistency validity was confirmed by assessing the Cronbach alpha coefficients and composite reliability (CR), which were all greater than 0.70. Items with factor loadings below 0.50 were removed to maintain the quality of convergent validity and prevent a decrease in AVE values. A summary of the convergent validity and reliability of the measurement model is presented in Table 2. model is presented in Table 2.

Variable	item	Loading	Cronbach's alpha.>.070	CR>.0.70	AVE > 0.50
Big data	BD1	0.728	0.909	0.925	0.579
	BD10	0.776			
	BD2	0.760			
	BD3	0.776			
	BD4	0.646			
	BD6	0.821			
	BD7	0.761			
	BD8	0.801			
	BD9	0.768			
Cost	COS1	0.718	0.705	0.819	0.533
	COS2	0.799			
	COS3	0.762			
	COS4	0.630			
Flexibility	FLX1	0.871	0.805	0.873	0.634
	FLX2	0.827			
	FLX4	0.772			
	FLX5	0.705			
Growth	GRO2	0.739	0.743	0.838	0.565
	GRO3	0.739			
	GRO4	0.734			
	GRO5	0.793			
Innovation	INNOV1	0.835	0.796	0.868	0.622
	INNOV2	0.761			
	INNOV3	0.825			
	INNOV4	0.729			

Seconded step discriminant validity: was confirmed using two methods: Fornell and Larcker's (1981) method and the heterotrait–monotrait (HTMT) ratio of correlations method, which is a more advanced technique for assessing discriminant validity (Henseler et al., 2015). According to Fornell and Larcker's method, the square root of the average variance extracted (AVE) of each construct should be greater than the correlation coefficients between the construct and other constructs. As shown in Table 3, all constructs had a square root of AVE greater than the correlation coefficients, indicating that discriminant validity was achieved

Table 3

Fornell and Larcker's					
	Innovation	BData	Cost	Flexibility	Growth
Innovation	0.789				
BData	0.706	0.761			
Cost	0.656	0.483	0.73		
flexibility	0.621	0.637	0.655	0.796	
Growth	0.612	0.551	0.532	0.623	0.751

Table 4

heterotrait–monotrait (HTMT) ratio					
	innovation	BData	Cost	flexibility	Growth
innovation					
BData		0.821			
Cost		0.866	0.598		
flexibility		0.768	0.74	0.87	
Growth		0.784	0.655	0.722	0.8

Table 4 presents the results of the HTMT method, which suggest that for conceptually different constructs, the test value should be less than 0.90 according to Hair et al. (2019). The values in Table 4 were all less than 0.90, indicating that discriminant validity was achieved in the study model for all constructs.

Evaluation of Structural Model

A structural equation investigation was employed to test the study proposed hypotheses. Specifically, the main aim is to examine the model’s aptitude to explain and predict the variation in the endogenous variables caused by the exogenous variable (Hair et al. 2012). Furthermore, (Cohen, 1988), R2 values of 0.02, 0.13 and 0.26 point to weak, moderate and substantial level respectively,. Accordingly, the endogenous variables Compitative Advatages has an R2 value of 0.509 this value exceeded the recommended threshold score and designating that the study model sufficiently represents the collected data. Likewise Q2 calculation displayed a value of 0.0.498 for compitative advantages, this values are more than zero indicating a satisfactory predictive power of the structure model (Hair et al., 2017) . The direct relationships in the structural model elucidated in Figure 2 and Table 5, the relationships were significant with (p < 0.05), the BData → COMP paths (0.713), the relationships are positive and considered strong, the only strong. The results obtained from smart PLS indicated that there are positive and significant direct impacts of the direct path BD→COMPA (β=0713, t-value=5.17659. p-value=0.000);

tt

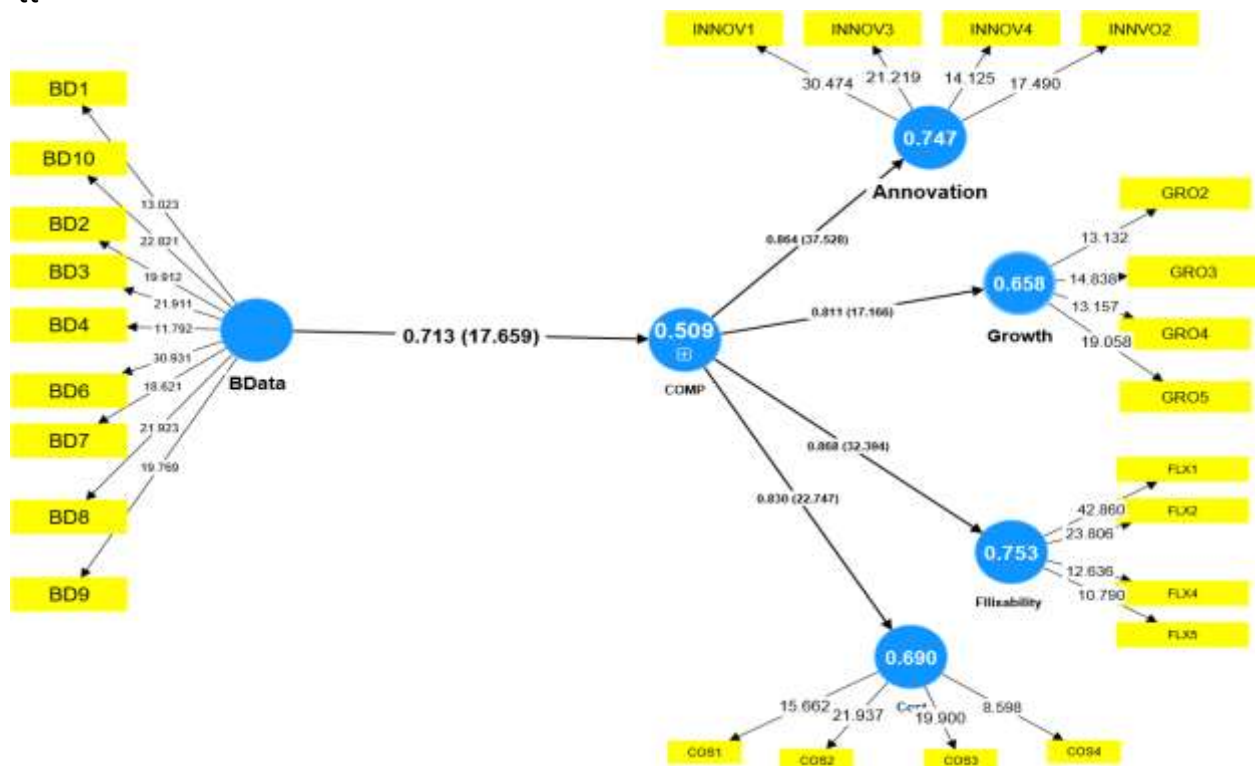


Table 5
Result of Direct Relationship

	Original sample	Sample mean (M)	(STDEV)	T statistics	P values
BData -> COMP	0.713	0.72	0.04	17.659	0.000

Discussion and Conclusion

The aims of this study was to explore the relationship between big data, and competitive advantages in Jordanian tourism companies. The study employed the Smart PLS4 analysis method to evaluate the direct and indirect effects of these variables. The results indicated that the direct paths linking big data and competitive advantages were positive and statistically significant. Specifically. In conclusion, these results indicate that big data is a crucial factor that can enhance the competitive advantages in Jordanian tourism companies.

This study makes a valuable contribution to the existing literature by shedding light on the importance of big data in enhancing the competitive advantages of firms that utilize big data. the study offers empirical evidence to support this claim. Additionally, the study underscores the importance of an integrated approach combines data analytics techniques to gain a competitive edge. The practical insights provided by the study can be particularly beneficial for firms looking to effectively leverage big data efforts. Furthermore, the study offers a framework for future research on the role of big data in digital marketing and its impact on firms' competitive advantages.

References

Barney, J. B., & Hesterly, W. S. (2012). *Strategic management and competitive advantage : concepts and cases.*
 Bartosik-purgat, M., & Ratajczak-mrozek, M. (2018). *Big Data Analysis as a Source of*

- Companies' Competitive Advantage : A Review. 6(4), 197–215.*
- Chui, M., McGuire, T., & Manyika, J. (2012). Why big data is the new competitive advantage. *Ivey Business Journal*, 7–8.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates.
- Czepiel, J. A. (1992). *Competitive marketing strategy*. Prentice Hall Englewood Cliffs, NJ.
- Erl, T., Khattak, W., & Buhler, P. (2016). *Big data fundamentals: concepts, drivers & techniques*. Prentice Hall Press.
- Grimm, C. M., Lee, H., Smith, K. G., & Smith, K. G. (2006). *Strategy as action: Competitive dynamics and competitive advantage*. Oxford University Press on Demand.
- Hagi, A., & Wright, J. (2020). When data creates competitive advantage. *Harvard Business Review*, 98(1), 94–101.
- Hair, J. F., Sarstedt, M., Ringle, C. M., & Mena, J. A. (2012). An assessment of the use of partial least squares structural equation modeling in marketing research. *Journal of the Academy of Marketing Science*, 40, 414–433. <https://doi.org/10.1007/s11747-011-0261-6>
- Hair Jr, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). A primer on partial least squares structural equation modeling (PLS-SEM). In *International Journal of Research & Method in Education* (2nd ed., Vol. 38, Issue 2). Sage publications. <https://doi.org/10.1080/1743727x.2015.1005806>
- Horng, J. S., Liu, C. H., Chou, S. F., Yu, T. Y., & Hu, D. C. (2022). Role of big data capabilities in enhancing competitive advantage and performance in the hospitality sector: Knowledge-based dynamic capabilities view. *Journal of Hospitality and Tourism Management*, 51(May 2021), 22–38. <https://doi.org/10.1016/j.jhtm.2022.02.026>
- Hurwitz, J., Nugent, A., Halper, F., & Kaufman, M. (2013). *Big data for dummies* (Vol. 336). John Wiley & Sons Hoboken, NJ.
- Inanc–Demir, M., & Kozak, M. (2019). Big data and its supporting elements: Implications for tourism and hospitality marketing. In *Big Data and Innovation in Tourism, Travel, and Hospitality* (pp. 213–223). Springer.
- Levy, P. S., & Lemeshow, S. (2013). *Sampling of populations: methods and applications*. John Wiley & Sons.
- Li, J., Xu, L., Tang, L., Wang, S., & Li, L. (2018). Big data in tourism research: A literature review. *Tourism Management*, 68, 301–323. <https://doi.org/10.1016/j.tourman.2018.03.009>
- Li, X., & Law, R. (2020). Network analysis of big data research in tourism. *Tourism Management Perspectives*, 33(August 2018), 100608. <https://doi.org/10.1016/j.tmp.2019.100608>
- Madi, M. A. (2021). The impact of big data analysis on competitive advantage support (Field study on industrial companies listed on the Palestine Stock Exchange). *Global Journal of Economics and Business*, 10(3), 630–646.
- Mikalef, P., Krogstie, J., Pappas, I. O., & Pavlou, P. (2020). Exploring the relationship between big data analytics capability and competitive performance: The mediating roles of dynamic and operational capabilities. *Information and Management*, 57(2), 103169. <https://doi.org/10.1016/j.im.2019.05.004>
- Omar, A. (2020). The Impact of Big Data Analytics Capabilities on Competitive Advantage Applied on “Etisalat Egypt.” *Arab journal for Administration* 356–337 ,(4)40 , <https://doi.org/10.21608/aja.2020.131098>

- Porter, M. E. (1985). *Competitive advantage: creating and sustaining superior performance*. 1985. New York: FreePress, 43, 214.
- Porter, M. E. (1998). *Competitive Advantage creating and sustaining superior performance*. New York: Free Press; London: Collier Macmillan, c1985.
- Porter, M. E. (2012). The new competitive advantage: Creating shared value. *Presentation at the HSM World Business Forum CSV*. Retrieved August, 21, 2016.
- Sekaran, U., & Bougie, R. (2016). *Research methods for buiness: A Skill-building approach*. John Wiley & Sons. https://doi.org/10.1007/978-94-007-0753-5_102084
- Shamim, S., Zeng, J., Muhammad, S., & Khan, Z. (2019). Information & Management Role of big data management in enhancing big data decision-making capability and quality among Chinese firms : A dynamic capabilities view. *Information & Management*, 56(6), 103135. <https://doi.org/10.1016/j.im.2018.12.003>
- Shan, S., Luo, Y., Zhou, Y., & Wei, Y. (2019). Big data analysis adaptation and enterprises' competitive advantages: the perspective of dynamic capability and resource-based theories. *Technology Analysis & Strategic Management*, 31(4), 406–420.
- Srivastava, R. K., Shervani, T. A., & Fahey, L. (1998). Market-based assets and shareholder value: A framework for analysis. *Journal of Marketing*, 62(1), 2–18.
- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509–533.
- Wang, W.-C., Lin, C.-H., & Chu, Y.-C. (2011). Types of competitive advantage and analysis. *International Journal of Business and Management*, 6(5), 100.
- Xiang, Z., & Fesenmaier, D. R. (2017). Big data analytics, tourism design and smart tourism. In *Analytics in smart tourism design* (pp. 299–307). Springer.