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The Impact of Information Technology Use on Achieving a Sustainable Competitive Advantage in Airlines Companies

Mohammad Abdalkarim Alzuod*

Department of Management, Faculty of Finance and Business, The World Islamic Sciences and Education University, Amman, Jordan. *Email: mohammad.alzuod@wise.edu.jo

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ABSTRACT

This aim of study is determining the impact of information technology use and its dimensions; equipment, software, databases, people, and networks, on achieving sustainable competitive advantage and its dimensions; quality, flexibility, innovation, and lower cost, in Airlines companies. The study targeted employees in senior and middle management. The study adopted approach of a descriptive analytical by using the IBM SPSS Statistics Software. The study used a comprehensive sampling of all participants, which consisted of 324 supervisory positions at Royal Jordanian Airlines. Only 260 questionnaires distributed were considered usable for next analysis, that it represents 80% of the population. The study concluded that there is a significant positive statistically impact of information technology use and its dimensions; equipment, software, databases, people, and networks, on achieving sustainable competitive advantage and its various dimensions; quality, flexibility, innovation, and lower cost, in Airlines companies. The study emphasized in their recommendations on enhancing the use of information technology and supporting it in its dimensions: (Equipment, software, databases, people, and networks), for its important and positive role in achieving a sustainable competitive advantage in Airlines companies.

Keywords: Information Technology Use, Sustainable Competitive Advantage, Airlines Companies, Jordan
JEL Classifications: M1, M15, Q56

1. INTRODUCTION

In light of globalization, the absence of regional or international barriers between countries, technological advancements, and the proliferation of social media, the growth in the number of businesses has performed a remarkable role to increase the types of products/services saturations in the market. This has led these businesses to focus on operating beyond their local borders to stimulate desire for their products and distinguish themselves from the competition. Furthermore, the needs and desires of customers have diversified, and businesses are now gathering information about competitors, customers, the market, and the variables both within and outside their organizations (Badawi et al., 2024). This has prompted these businesses to research and develop mechanisms and strategies to strengthen them cope with the intensity of the competition that increased in their markets (Hassanein et al., 2022).

Competitiveness has become an urgent necessity for countries seeking sustainability, improved living standards, and greater participation in progress. It is no longer solely a matter of survival or growth for businesses; all productive and service-oriented organizations strive to enhance their product or service delivery to accomplish a sustainable competitive advantage (Satar et al., 2025). This advantage allows them to maximize returns compared to their competitors. Therefore, companies must pursue a competitive edge in their outputs as a strategic leap forward for society. This can only be achieved by offering products of exceptional quality (Damak, 2022). The rapid advancements in information technology have significantly impacted many practical and scientific aspects. These developments have also presented organizations with a major challenge: Adapting their methods to maintain high-quality service delivery (Balghnami and Fardi, 2019).

The study attempts to highlight, through its study, the use of information technology with its elements and dimensions to achieve a competitive advantage in Royal Jordanian Airlines, through a statistical survey measuring the impact for each dimension of information technology use the (independent variable) of the study on the dependent variable (sustainable competitive advantage), and illustration the results that are expected to be achieved from this study with a set of recommendations.

Recently, competition among airlines in the Arab region has intensified, especially with the emergence of low-cost airlines, which have posed a significant challenge to most airlines, both large and small. To counter this type of competition, the company has developed multiple strategies, both short-term and long-term. To reduce the impact of these airlines on the company's market share. By working to develop the types of services provided and elevate them to meet travelers' aspirations and desires, facilitating their travel procedures, offering them greater travel options, and leveraging the numerous advantages offered by the global airline alliance "one world," of which Royal Jordanian is a member, the company has adopted a group of standards to mitigate the effect of the pandemic of COVID-19 on its operations. The company's management believes that information technology is a fundamental resource for achieving a competitive advantage, as it boosts the company with a unique edge that its competitors lack. In 2022, Royal Jordanian implemented advanced electronic systems across various sectors to develop innovative solutions that contribute to adapting to the current situation, improving operational processes, and providing safe travel solutions for passengers. These initiatives included the launch of oracle fusion, an air cargo and mail system, revenue management systems, XDR cybersecurity management systems, the new fly high program, and the royal club frequent flyer program (Royal Jordanian Annual Report, 2024).

The problem of statement emphasized in determining the impact of sustainable competitive advantage and its evolving nature within Royal Jordanian Airlines, and the ability of company to maximize on the benefits it will reap from applying the construct of sustainable competitive advantage. It is also noticeable that the lack of previous studies which have studied their variables in Jordan at the same time. Moreover, this study is a response to recommendations from some previous studies focusing to the need for more attention to the applying of information technology and its effective role in creating a sustainable competitive advantage. Hence, the research problem can be formulated as the following question: Does the information technology use, with its dimensions; hardware, software, databases, people, and networks, have an impact on achieving sustainable competitive advantage, with its dimensions; quality, flexibility, innovation, and lower cost, in airlines companies?

2. LITERATURE REVIEW

2.1. Information Technology (IT)

Certainly, the definition of Information technology is the accumulated and available body of knowledge, experience, and skills, alongside with the, organizational, physical, and administrative tools used by humans to obtain, process, and store spoken, graphic, and digital information in order to facilitate access to and exchange of information, making it available to everyone (Bramki and Rahmouni, 2022). According to Belghnami and Fardi (2019) that defined it as a set of human and physical components, software, and procedures that work to combine, process, store, restore, and distribution of information to boost process of decision-making and control in an organization. While, Fatis (2019) showed information and communication technology as a mingle of different tools and techniques provided by modern methods that aim to simplify activity and develop its performance, offering speed, accuracy, and high transparency, in addition to its wide range, thus enabling sound decisions.

It is understood from the previous discussion that IT includes the use of computers, software, networks, and other processing of digital technologies, storing, and transmitting information. It covers a broad reach of activities, including, such as; the design, development, implementation, and maintenance of computer systems and software applications, in addition to the management of networks, databases, and other digital assets. For this study, it adopted on the studies by Damak (2022) and Qarash (2021) to identify the dimensions of information technology use, e.g.; equipment, software, databases, people, and networks.

2.2. Sustainable Competitive Advantage (SCA)

To begin with, sustainable competitive advantage is defined as an efforts, developments, and innovations that completed by organizations to achieve a distinguished position that sets them apart from other organizations (Zarafili and Zarafili, 2021). It also involves maintaining this position for a longer period and developing further to keep pace with current and future changes and developments (León-Gómez et al., 2025). Furthermore, according to El-Derawi (2021) that reviewed as the continuous development of an organization's unique and different resources in response to rapidly changing market conditions, enabling the organization to achieve a distinctive competitive position relative to current and potential competitors while creating value for customers. On the other hand, a sustainable competitive advantage represents the capability to offer goods/services more effectively and efficiently than competitors in the market, thereby achieving customer satisfaction (Al Mubarak and Hamdan, 2023). It also means the organization's ability to meet multiple customer needs and desires by meeting products/services at a suitable price, with high quality, and on time. This implies meeting customer needs more efficiently, effectively, and with a different growth process than that offered by other competing firms within the structure of industry (Alzuod et al., 2025). Hence, Abdul Razzaq and Hammad (2021) emphasized that creating SCA is achieved by the firm's available capabilities and resources to produce lower-cost or high-quality products. Therefore, the decision to choose cost reduction or product differentiation is a strategic competitive decision for the organization.

Based on previous studies, such as that of Nyuga and Tanova (2024), Mohd Zawawi and Abd Wahab (2019). and Ayed and Bashari (2020), Suryantini, Moeljadi, Aisjah and Ratnawati (2023), this study adopted the dimensions of a sustainable competitive advantage, such as: lower cost, quality, flexibility, and innovation.

2.3. Information Technology Use and Sustainable Competitive Advantage

Previous studies addressing the use of information technology have had diverse objectives. Some studies examined information technology use and impact it on job performance, such as the study by Abbasi Kamardi et al. (2025), Qarash (2021) and Masoud (2019). Other studies identified the role of information technology in activating e-government, such as Balghnami and Fardi (2019). Furthermore, some studies addressed the dependent variable of sustainable competitive advantage, such as Muwadiya and Abu Qaoud (2022), which examined the effect of strategic orientation on performing SCA, and other study of Ayed and Bashari (2020), which investigated the effect of human capital on achieving SCA. Lastly, some studies emphasized to connect the impact of information technology use on achieving SCA to the matching of this study, such as Damak (2022). This study was different from its predecessors in its dealings of the dimensions of information technology use and its impact on achieving SCA in Royal Jordanian Airlines, and in combining the information technology use (independent variable) with its dimensions; equipment, software, databases, people, and networks), and the sustainable competitive advantage (dependent variable) with its dimensions; quality, flexibility, creativity, and lower cost.

Based on the previous discussion and review related studies, the hypotheses below were formulated:

H_{01}: There is no statistically significance impact of information technology use and its dimensions (equipment, software, databases, people, and networks) on achieving sustainable competitive advantage and its dimensions (quality, flexibility, innovation, and lower cost) in Airlines companies at the level of ($\alpha \leq 0.05$).

H_{01a}: There is no statistically significance impact of equipment on achieving sustainable competitive advantage and its dimensions (quality, flexibility, innovation, and lower cost) in Airlines companies at the level of ($\alpha \leq 0.05$).

H_{01b}: There is no statistically significance impact of Software on achieving sustainable competitive advantage and its dimensions (quality, flexibility, innovation, and lower cost) in Airlines companies at the level of ($\alpha \leq 0.05$).

H_{01c}: There is no statistically significance impact of Databases on achieving sustainable competitive advantage and its dimensions (quality, flexibility, innovation, and lower cost) on airlines companies at the level of ($\alpha \leq 0.05$).

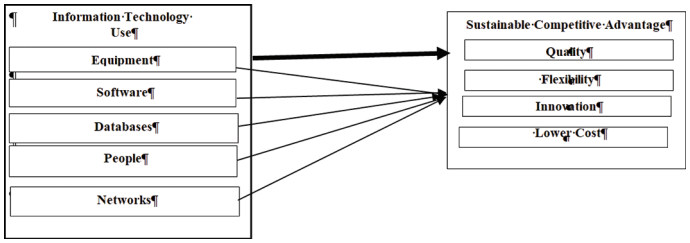
H_{01d}: There is no statistically significance impact of People on achieving sustainable competitive advantage and its dimensions (quality, flexibility, innovation, and lower cost) in Airlines companies at the level of ($\alpha \leq 0.05$).

H_{01e}: There is no statistically significance impact of Networks) on achieving sustainable competitive advantage and its dimensions (quality, flexibility, innovation, and lower cost) in Airlines companies at the level of ($\alpha \leq 0.05$).

2.4. Study Model

The study adopted the model as below to show the relationship between the independent and dependent variables to accomplish the study's objectives, as shown in Figure 1:

Figure 1: Study of model



Source: (Damak, 2022; Qarash, 2021; Mohd Zawawi and Abd Wahab, 2019; Ayed and Bashari, 2020)

3. METHODOLOGY

3.1. Study Sampling

324 employees representing senior and middle management positions at Royal Jordanian Airlines headquarters in Amman, that consisted all the population of study (Royal Jordanian Airlines Annual Report 2024). A comprehensive sample was conducted because of the small size of the study population. 324 of the questionnaires was distributed to all supervisory positions within Royal Jordanian Airlines. Only 290 questionnaires were returned, that representing 89% of the study sampling. (30) questionnaires were neglected as they were unusable for analysis. Therefore, (260) questionnaires were suitable for analysis, constituting 80% of the study sampling. This percentage is excellent, representative, and acceptable for analysis purposes. It is also higher than the minimum acceptable sample size according to the Sekaran table. The researcher used an electronic method for data distribution, employing Google Forms, which allows for the design, E- distribution, and collection of responses.

A developed questionnaire was carefully measure and reflect the variables of study. Its adopted virous previous studies to design the questionnaire and items of construct. The items of questionnaire were sectioned into three parts. The section (1) was included the demographic data of the respondents. The section (2) consisted of twenty five items to measure the dimensions of the information technology use. The section (3) of the questionnaire, consisting of twenty items to measure the dimensions of the sustainable competitive advantage. The study adopted on many previous studies to measure of variables of study, such as; Damak (2022), Qarash (2021), Mohd Zawawi and Abd Wahab (2019), and Ayed and Bashari (2020). Five point Likert scale that employed to measure the responses of the respondents of questionnaire (Sekaran and Bougie, 2016).

Regard with internal consistency for the items of questionnaire, that refers to an individual's score stability and the consistency of their order of responses when the test is administered repeatedly, reliability is used to identify the accuracy of the questionnaire and the absence of contradictions between its items. The reliability of questionnaire is measured by the Cronbach's alpha coefficient. Cronbach's alpha coefficient ranges from 0 to 1, and the questionnaire items should have a reliability value of at least 0.7. Table 1 shows that Cronbach's alpha coefficients for the variable items range between 0.941 and 0.885, also, all items met the reliability requirement by exceeding 0.7. This refers that all items

Table 1: Cronbach's Alpha reliability of constructs

No.	Construct	Sub-construct	No. of items	Cronbach's alpha
1	Information technology use	Equipment	5	0.885
		Software	5	0.921
		Databases	5	0.894
		People	5	0.911
		Networks	5	0.932
2	Sustainable competitive advantage	Quality	5	0.888
		Flexibility	5	0.922
		Innovation	5	0.896
		Lower cost	5	0.941
	Total		45	**0.910***

*The reliability coefficient for the overall of the items.

in the questionnaire are reliable. The "Lower Cost" dimension items illustrated the highest value of reliability (0.941), while the "Equipment" dimension showed the lowest value of reliability with a coefficient of 0.885. Consequently, the reliability coefficient reached a high value of 0.910 for the overall of the items.

4. RESULTS

4.1. Demographic Data of the Respondents Study Sample

According to the results of study showed differences in the demographic data of the respondent's study sample, indicating diversity and varying personality characteristics. The outcomes also showed that the majority of the sample was male (52.6%), while females comprised 47.4%. This shows a fair distribution of supervisory positions between men and women at Royal Jordanian Airlines. Regarding to the age group of the sample was measured across four categories. The largest group was under 30 years old (40.8%), while the smallest group was 50 years and older (12%). This indicates that Royal Jordanian Airlines' policy is to provide opportunities for young people to fill supervisory positions. Lastly, educational qualifications, the vast majority (45.76%) held a bachelor's degree.

4.2. Analysis of Data and Testing of Hypothesis

The collected data were analyzed and the hypotheses tested using by the IBM SPSS Statistics Software. The variables of study were described using statical outcomes such as arithmetic means and standard deviations for their dimensions. The hypotheses of study were tested by using linear regression. The arithmetic means for the variable's dimensions were calculated to define the information technology use level in Royal Jordanian Airlines, Tables 2 and 3 shows the results.

Table 2 shows that the arithmetic means for the information technology use dimensions' of are all within the high importance range relatively. The highest arithmetic means among the of information technology use dimensions', with a value of (3.934) was the dimension of database, while the lowest arithmetic mean among the dimensions, with a value of (3.89) was the dimension of people which is also within the high relative importance range. Overall, the level of information technology use in Royal Jordanian is considered high, as the variable achieved an arithmetic mean of (3.91), which is classified as high relative importance.

Table 2: The arithmetic means of the information technology use (independent variable)

Items	Ranking	Arithmetic mean	Results
Equipment	3	3.914	High
Software	1	3.934	High
Databases	5	3.980	High
People	4	3.980	High
Networks	2	3.916	High
Information technology use (overall arithmetic mean)		3.91	High

Table 3: The arithmetic mean of the sustainable competitive advantage (independent variable)

Items	Ranking	Arithmetic mean	Results
Quality	1	3.850	High
Flexibility	4	3.810	High
Innovation	3	3.820	High
Lower cost	2	3.830	High
Sustainable competitive advantage (overall arithmetic mean)		3.82	High

To determine the level of sustainable competitive advantage (as the dependent variable) in Royal Jordanian, the arithmetic means for the dimensions of the dependent variable were calculated Table 3 shows the results:

Regarding to Table 3, the arithmetic means of the dimensions of sustainable competitive advantage showed that they were of high relative importance. The highest arithmetic means among the of sustainable competitive advantage dimensions', with a value of (3.85) was the dimension of quality, while the lowest arithmetic means, with a value of (3.81) was the dimension of flexibility which is also of high relative importance. Overall, the level of sustainable competitive advantage in Royal Jordanian is considered high, as the variable achieved an arithmetic mean of (3.82), which is labeled as of high importance relatively. These results show that Royal Jordanian believes that possessing a sustainable competitive advantage will place it at the priority of the market, reflect it the largest market share, enable it to achieve success in companies, and help it accomplish its set goals.

4.3. Testing of the Study Hypotheses

Multiple linear regression analysis (MLR) as statistical tests were used to test the hypotheses. Main Hypothesis is; There is no statistically significance impact of information technology use and its dimensions (equipment, software, databases, people, and networks) on achieving sustainable competitive advantage and its dimensions (quality, flexibility, innovation, and lower cost) in Airlines companies at the level of ($\alpha \leq 0.05$). Was used to test the main hypothesis, and Table 4 illustrates the results of multiple linear regression analysis.

The results of the main hypothesis that tested at a significance level of ($a \leq 0.05$), were as following. To confirm the significance of regression that the tabulated F-value (F-value) was calculated and compared with the ANOVA F-value. The calculated F-value (173.448) was found to be bigger than the tabulated F-value (2.31),

Table 4: The multiple regression analysis for the main hypothesis of study

Dependent variable	Correlation coefficient R	Determination coefficient R^2	F	Degrees of freedom	Significance	Independent variable information technology use	B	T	Significance
Sustainable competitive advantage	0.879	0.773	173.448	5 254	0.000	Equipment	0.487	2.537	0.012
						Software	0.653	2.877	0.004
						Databases	1.432	6.795	0.000
						People	0.532	2.248	0.020
						Networks	0.478	2.419	0.016

*The significance level ($\alpha \leq 0.05$)

this means that the significance of the model was confirmed which the using of regression analysis.

The significance level adopted in the study, that compared with the significance level of the test. To illustrate a statistical effect on Sustainable Competitive Advantage as the dependent variable, Table 4 shows that the significance level for (F) is lower than the significance level adopted in the study, with a value of (0.05). Therefore, the main hypothesis study was rejected and the alternative hypothesis was accepted, which stipulates: "There is no statistical impact at the significance level of ($\alpha \leq 0.05$) of information technology use and its dimensions (equipment, software, databases, people, and networks) on achieving sustainable competitive advantage and its dimensions (quality, flexibility, innovation, and lower cost) in airlines companies." Regarding to the R-value, which shows the correlation between the independent and dependent variables, is shown in Table 4. The correlation coefficient is 0.879, that refers to a strong correlation positively between the independent variables (equipment, databases, people, software, and networks) and the dependent variable (sustainable competitive advantage). The value of (R^2) which refers a coefficient of determination (0.773) which shows the power of explanatory of the independent variables dimensions (equipment, databases, people, software, and networks) combined for the dependent variable. This illustrates that the independent variables explain 77.3% of the sustainable competitive advantage. The table also shows that the significance level for the dimensions of the independent variable (equipment, databases, people, software, and networks) is significant statistically at the 0.05 level, which is less than the test's target of 0.05 for both. The constant (B) is 0.724 which the value that is necessary for construct of the regression equation for the variables.

5. DISCUSSION

The main important outcomes of the study will be introduced and showed suitable recommendations. It will discuss the first question: "What is the impact of information technology use and its dimensions; hardware, software, databases, people, and networks on achieving sustainable competitive advantage and its dimensions; quality, flexibility, innovation, and cost in Airlines companies." The findings of study indicate that the dimensions of information technology use (hardware, software, databases, people, and networks) have a statistically significant and positive impact on achieving sustainable competitive advantage in Airlines companies. A strong positive relationship was description for the relationship between information technology use and sustainable competitive advantage, such that sustainable competitive advantage is significantly affected by any changes in information technology. Information technology use contributes to clarification managerial innovation by 77.3%. Hence, that means an information technology use is responsible for accomplishing 77.3% of sustainable competitive advantage. The study consistent with study of Damak (2022) that found the dimensions of information technology have a statistically significant impact on achieving sustainable competitive advantage in government organizations of Kuwaiti. It also consistent with Ngah et al. (2015) study that found there is significant relationship a statistically between the information technology use and sustainable competitive advantage in SMEs manufacturing enterprises. Moreover, it consistent with Alizadeh (2014) study that indicates the information technology use has a significant impact on achieving sustainable competitive advantage in companies of food in Golestan.

The findings of study showed that the information technology use dimensions' have an effect on achieving sustainable competitive advantage in Airlines companies. The dimension of people is the most effective among the information technology use dimensions in achieving sustainable competitive advantage, as it interprets individually 83.7% of the implementation of sustainable competitive advantage.

Regarding to the second question of the study: "What is the level of information technology use in Airlines companies?" The research found that the level of information technology use in Airlines companies achieved a high importance relatively. This high level of information technology use behaves from Airlines companies that focus on their dimensions of the variable, reflecting its commitment to combination information technology among its processes of work. The dimension of database fulfills the highest value of mean, that indicates to the maximum priority for Royal Jordanian Airline. This stimulates the airline's companies' belief that secure databases supply decision-makers with timely information. Airlines companies also prioritizes upgrading its databases and implementing all necessary procedures to preserve them from loss or damage, recognizing them as the corner stone of its operations and the primary techniques of ensuring sustainability of business. The information technology use variable achieved a high importance of 3.91 relatively. This result consistent with the study of Qarash (2021), which found a high level of information technology use at the Higher Institute of Science and Technology in Al-Jamil. It also aligns with the study of Masoud (2019), which indicated a high level of information technology use in the University of Khartoum.

Lastly, the third question: "What is the level of sustainable competitive advantage in Airlines companies?" The study specified that the sustainable competitive advantage level in Airlines companies achieved a high importance relatively. This sustainable competitive advantage behaves from Airlines companies focus on the dimensions of the variable, particularly, its commitment to implementation the greatest quality standards in its procedures of work. Airlines companies also ensures that all process and procedures are flexible sufficiently to adapt to changes. Therefore, Airlines companies emphasize innovation, adopting it to be remarkable component of firm's development, competitiveness, and acquisition of market share. Airlines companies also prioritizes strategy of a cost-effective to catch new customers, expand its market share, and retain existing customers. The dimension of quality achieved the highest arithmetic mean, that means Airlines companies' have belief to adopting the greatest quality standards is the key to success and development. The sustainable competitive advantage variable achieved a high importance relatively (3.82). This finding consistent with the Assasfa and Bashabsheh (2022) study, which also found a high level of sustainable competitive advantage among commercial banks in Jordan.

6. CONCLUSION

This study aims to determine the impact of information technology use and its dimensions; equipment, software, databases, people, and networks, on achieving sustainable competitive advantage and its dimensions; quality, flexibility, innovation, and lower cost, in Airlines companies. The study targeted employees in senior and middle management. The study adopted approach of a descriptive analytical by using the IBM SPSS Statistics Software., The study used a comprehensive sampling of all participants, which consisted of 324 supervisory positions at Royal Jordanian Airlines. Only 260 questionnaires distributed were deemed valid for analysis, representing 80% of the population. The study introduced the a various of findings, that there is a statistically significant positive impact of information technology use and its dimensions; equipment, software, databases, people, and networks, in achieving sustainable competitive advantage and its dimensions; quality, flexibility, innovation, and lower cost in Airlines companies.

The study identifies many recommendations to enhancing and supporting the information technology use in all its dimensions: (Hardware, software, databases, people, and networks), given its importance and positive role in achieving sustainable competitive advantage in Airlines companies. It also indicates the need to increase attention to the people and software dimensions, as they are the only two dimensions of the independent variable with the lowest arithmetic mean among the other dimensions of information technology use. Furthermore, the study recommends continuing efforts to increase the level of sustainable competitive advantage in Airlines companies by improving the level of services provided to customers, whom the necessary drivers of competitiveness, and by fostering a culture of continuous development and modernization among employees, equipping them with the primary skills to boost their professional capabilities.

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