第 49 卷 第 3 期
2022 年 3 月

湖南大学学报（自然科学版）
Journal of Hunan University (Natural Sciences)

Vol. 49 No. 3
March 2022

Open Access Article https://doi.org/10.55463/issn.1674-2974.49.3.30

The Impact of Adopting Innovative Technologies in Telecommunications Companies on Constructive and Destructive Behaviors of Leaders

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Abstract: The study aims to identify the impact of adopting innovative technologies in telecommunications companies on constructive and destructive behaviors of leaders. A quantitative questionnaire survey was adopted, and the data was collected from 380 employees of the three major telecommunications companies in Jordan (Orang, Zain, and Umniah). The results revealed a positive impact of adopting innovative technologies on constructive leadership behaviors. Furthermore, adopting innovative technologies has no impact on destructive leadership behaviors. Our research mainly contributes positively and significantly to highlighting the importance of shifting focus in organizations that rely on innovative technology from the detrimental impact of a disruptive leader on company sustainability and service improvement. This study contributes to the literature on innovation and modern technology in general and the literature on leadership behaviors and constructive and destructive leadership in particular. First, to the authors' knowledge, this study is the first to examine the impact of innovative technology on leaders' behaviors. Second, although the broader leadership and technology literature has provided some new insights into the direct impact of the interaction between leader behaviors and technology adoption, the results have often been inconclusive.

Keywords: innovative technologies, constructive leaders, destructive leaders, telecommunications companies.

电信公司采用创新技术对领导者建设性和破坏性行为的影响

摘要：该研究旨在确定电信公司采用创新技术对领导者的建设性和破坏性行为的影响。采用定量问卷调查，数据来自约旦三大电信公司（红毛猩猩、扎因和乌尼亚）的380名员工。结果揭示了采用创新技术对建设性领导行为的积极影响。此外，采用创新技术对破坏性领导行为没有影响。我们的研究主要有助于突出在依赖创新技术的组织中转移焦点的重要性，以免破坏性领导者对公司可持续性和服务改进产生不利影响。这项研究有助于一般的创新和现代技术文献，特别是关于领导行为和建设性和破坏性领导的文献。首先，据作者所知，本研究首次考察了创新技术对领导者行为的影响。其次，尽管更广泛的领导力和技术文献提供了一些关于领导者行为和技术采用之间相互作用的直接影响的新见解，但结果往往没有定论。

关键词：创新技术, 建设性的领导者, 破坏性的领导者, 电信公司。

1. Introduction

Discourses and practical experiments on models and practices associated with innovative technologies in organizations have intensified since the mid-1990s [1], [2]. This has resulted from the realization that adopting technologies can aid in making effective decisions, solving problems, facilitating innovations and creativity, and achieving competitive advantage at all levels [3]. Innovation, incorporation of technology, and exploiting technology are sources of potential competitive advantage in firms. [4] assert that innovative technologies encompass analyzing and

Received: December 11, 2021 / Revised: January 10, 2022 / Accepted: February 9, 2022 / Published: March 28, 2022
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targeting new markets or services to improve information and knowledge acquisition and the venture's overall competitiveness in the marketplace.

Although there is much literature related to the study of information technology in organizations, very little is reported on the effects of innovative technologies and public value on developing countries, especially with regard to designing smart strategies in service companies [5]. There are different types of technologies that organizations have adopted throughout history; an important feature of innovative technologies is to bring about changes in companies. [6] believe that the effects of these technologies have been beneficial, as they bring positive results in terms of efficiency, transparency, accountability, and the interaction between the company and customers. Some of these technologies are called "smart" because they operate online and are characterized by improved efficiency, reduced costs, better communication and interaction between people, networking and collaboration (e.g., social networks). These technologies also perform activities that were previously restricted to humans (such as mechanical robots, service kiosks, and automated teller machines). However, nowadays, these technologies are replacing people in their daily and routine activities [7].

The previously mentioned new research direction studying leadership [8] clarified the research gap and the necessity of research to examine leadership styles and competitive strengths reflected in innovative technology [9]. Telecom leaders rely on innovative technology skills, experience, and capabilities to work with leading corporate partners. These leadership competencies allow strategy formulation and implementation [10]. Building on global leadership research and previous research on management capabilities, we fill a gap by linking the characteristics and behaviors of a business leader and corporate strategic actions - specifically in relation to linking the level of application of innovative technology to business leadership styles in service companies such as communication companies [11].

The main objective of this research was to study the impact of innovative technology on leadership behaviors in Jordanian telecom companies. This study is organized as follows after introducing and explaining the research background. Section 2 describes the literature review. We explore definitions of variables and build relationships between variables. Five hypotheses will be tested in this study. Section 3 explains the methodology, research design, research strategy for answering the research questions, data collection, and hypothesis testing. The next section consists of data analysis, an explanation of findings, and a discussion of the real context. Finally, in Section 5, we conclude and make recommendations for future research.

1.1. The Research Hypotheses

The hypotheses can be presented as follows:

Main Hypothesis (H_{01}): There is no impact of adopting innovative technologies and its variables (artificial intelligence, big data, the Internet of Things) on the behaviors of leaders and their variables (constructive leadership behaviors, destructive leadership behaviors) at $\alpha \leq 0.05$ in telecommunications companies.

This hypothesis is divided into three sub-hypotheses:

$H_{01.1}$: There is no impact of adopting innovative technologies and its variables (artificial intelligence, big data, the Internet of Things) on constructive leadership behaviors at $\alpha \leq 0.05$ in telecommunications companies.

$H_{01.2}$: There is no impact of adopting innovative technologies and its variables (artificial intelligence, big data, the Internet of Things) on destructive leadership behaviors at $\alpha \leq 0.05$ in telecommunications companies.

1.2. Conceptual Framework

This research adopted the following model based on the literature review:

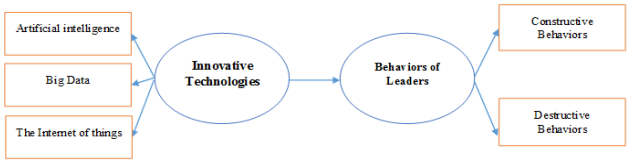

Fig. 1 Conceptual framework

2. Literature Review

2.1. Innovative Technologies

In light of today's global competition, companies do not develop through traditional work strategies but rather with the skills and knowledge they possess from the people working for them. So, the organization must develop a strategy for creativity to provide the appropriate climate for the success of its creative work, and this is not an easy task because the success of the innovation process depends on factors, many of which are related to the company and working individuals at different levels of management [12]. However, a single constant principle distinguishing the current business environment for most institutions is change, where the only rule for growth and development is competition. In this environment, institutions grow unprecedentedly, markets transform, and technology evolves [13].

Several factors can lead to the success of this strategy and the achievement of its objectives, which are focused on the presence of advanced devices, equipment, and software, which are important factors in the improvement of products [14]. However, they can only be achieved by providing sufficient financial support for the senior management of the research and development department and coordination between the

company's departments to create work integration that ultimately leads to creativity [1].

Modern technology used in the business sector, such as applications and electronic programs, saves the human efforts necessary to carry out many tasks. The human effort is limited to analysis and decision-making. Innovation technology has also facilitated marketing and sales operations [15]. Through modern applications, websites, and e-mail marketing, it has become possible to rely on a smaller number of marketing staff and the resources needed to carry out its operations. This technology has significantly developed sales operations and expanded target markets [16].

Creativity can be defined as new and useful ideas related to solving specific problems or assembling and recombining known knowledge patterns into unique forms. Creativity is not limited to the technical side. It includes the development of goods and related processes and market preparation. It goes beyond machinery, equipment, manufacturing methods, improvements in the organization, training results, and job satisfaction, leading to increased productivity [17].

Adopting innovative technology helps improve the quality of products and develops employees' thinking skills through group interaction and brainstorming. It also enhances the enterprise's reputation in customers' minds [30] and helps promote the spirit of competition among companies [18]. Furthermore, the adoption of innovative technology helps to find ways to increase the volume of sales in the organization and improve the quality of decisions taken to solve problems within the organization in various fields, whether economic, technical, or marketing, in addition to solving problems related to the work environment [9].

Adopting innovative technology increases productivity. Productivity is the most important element companies and institutions seek to improve and develop because of its great importance in developing their production and increasing their competitiveness in the labor market [3], where productivity has received attention from many economic experts and decision-makers, especially over the past few years. Productivity directly depends on the extent of experience and efficiency of human resources and the availability of financial and information resources in any institution [15].

Qualified leadership is important in any organization as it can motivate employees to use their energies and expertise to develop their abilities to accomplish the assigned tasks. Employee motivation is one of the main keys to improving the quality of work [19]. Motivating employees to provide their best is one of the main tasks of a successful leader, as the presence of the ideal leader is reflected in improving the quality of services and products. The manager uses motivational strategies that motivate the employee to develop their skills and provide moral and material support aiming at a work environment that supports creativity [11].

Innovative technology in companies enhances leaders' constructive behaviors, such as possessing effective communication skills. They are closely related to their effectiveness as leaders [20] as modern technology facilitates effective communication between leaders and employees. Innovative technology also increases the leader's technical knowledge, managerial skills, and ability to plan. Planning expresses the roadmap that enables the leader to take clear and specific steps to reach the goal that the leader and his team want [21].

Innovative technologies increase the leader's ability to empower employees, train them to use modern strategies at work, work closely with individuals, provide feedback, and choose the appropriate empowerment method saving time and effort for them and the team and ensuring their effectiveness. Creativity technology also helps pioneer the leader's ability to make the appropriate decisions at the right time. This type of technology helps provide all the data that the leader needs to make crucial decisions reflected in the company's success, maintain its continuity in the labor market, and achieve its strategic goals [22].

2.2. Types of Leaders

There are two types of leaders:

- *Leaders with constructive behaviors:* They are good listeners to the individuals working within the company, can plan, and are characterized by democracy in the company's management, which involves workers in decision-making and encourages them to work effectively and in a team spirit. Constructive leaders can coordinate and organize tasks. They provide material and moral incentives to employees without discrimination and cooperate with everyone as they can balance the individuals' and the company's interests and have clear future goals [11].
- *Leaders with destructive behaviors:* They cannot lead their teams properly but rather lead them to the abyss and lower levels in work. Destructive leaders cannot accept mistakes and blame others when something goes wrong. Destructive leaders prove themselves by reprimanding their employees in public. They cannot listen to others. Success, in their opinion, is to be tyrannical. Leaders with destructive behaviors do not have the spirit of cooperation and teamwork. They see their team members as competitors and try to hide their information and experience [23].

3. The Research Instrument

The instrument contains 26 questions measuring the impact of adopting innovative technologies in telecommunications companies on constructive and destructive behaviors of leaders. The questionnaire was distributed by hand.

The questionnaire contains three demographic

variables and 26 questions representing study variables as follows:

The independent variable (Innovative Technologies) is formulated into benchmarks or objectives to reach, three fields with 12 questions.

The dependent variable (Behaviours of Leaders) is formulated into 14 questions.

4. Data Analysis and Interpretation

For examining the impact of adopting innovative technologies in telecommunications companies on constructive and destructive behaviors of leaders, Statistical Package for Social Sciences (SPSS) was used for processing the following statistical data:

4.1. Study Sample

The study population consisted of a random sample of 380 telecommunications companies' employees. It is classified by demographic characteristics in the tables below:

Table 1 Demographic characteristics of the study sample

Demographic characteristics	Groups	Sample	
		Frequency	Percentage
Gender	Male	207	53.4
	Female	181	46.6
	Total	388	100%
Academic Level	Bachelor's Degree	271	69.7
	Master's Degree	65	16.8
	Doctorate	52	13.4
	Total	388	100.0
Years of Experience	Less than 1 year	49	12.6
	1-3 years	52	13.4
	3-5 years	251	64.7
	More than 5 years	36	9.2
	Total	388	100.0%

Table 1 shows that the percentage of males from the sample was 53.4%, and that of females was 46.6%. For the variable "Academic Level," the Bachelor's degree was achieved by 69.7%, the Master's degree by 16.8%, and the doctorate by 13.4%. For the variable "Years of Experience," less than 1 year was with 12.6 %, 1 –3 years with 13.4%, 3–5 years with 64.7%, and more than 5 years with 9.2%.

4.2. Validity and Reliability of the Instruments

The test gave to experts to judge the extent to which the test is valid and reliable. For this reason, the test would be designed to meet such requirements of the validity of the test. The experts will be chosen according to their broad experiences in the field.

To reach the test reliability and research goal, which is the impact of adopting innovative technologies in telecommunications companies on constructive and destructive behaviors of leaders, the researcher used the reliability test for the instruments of measurement. The reliability of a measure highlights the stability of consistency with which the instrument is measuring the concept and helps assess the 'goodness' of a measure to determine if the students achieve stability.

Table 2 Cronbach's alpha for the study fields

Field number	Field	Value of α
Independent Variables: Innovative Technologies		
F1-1	Artificial intelligence	0.808
F1-2	Big Data	0.874
F1-3	The Internet of things	0.793
Dependent Variables: Behaviors of Leaders		
F2-1	Constructive leadership behavior	0.826
F2-2	Destructive leadership behaviors	0.714

Table 2 shows that the Cronbach's alpha for the study fields was above 0.60, which will lead to the stability of the results for this study.

5. Study Results

For analyzing the data and exploring the impact of adopting innovative technologies in telecommunications companies on constructive and destructive behaviors of leaders, simple regression is used.

Main Hypothesis (H01): There is no impact of adopting innovative technologies and its variables (artificial intelligence, big data, the Internet of Things) on the behaviors of leaders and their variables (constructive leadership behaviors, destructive leadership behaviors) at $\alpha \leq 0.05$ in telecommunications companies.

We used the simple regression test to check the direct impact of adopting innovative technologies and its variables (artificial intelligence, big data, the Internet of Things) on the behaviors of leaders and their variables (constructive leadership behaviors, destructive leadership behaviors) at $\alpha \leq 0.05$ in telecommunications companies, as shown in the tables below.

Table 3 Simple regression test to check the direct effect of adopting innovative technologies on the behaviors of leaders in telecommunications companies

Dependent Variable	R	R^2	F	DF	Coefficients			
					Predictor	B	T	Sig
Behaviors of Leaders	.169	.029	11.329	1 386 387	Innovative technologies	0.219	3.366	0.001

Table 3 shows the significant effect of adopting innovative technologies on the behaviors of leaders in telecommunications companies because the significant value was 0.001, less than 0.05. The R-value is the square root of the R-squared. The correlation between the observed and predicted values of the dependent variable was 0.169. The coefficient of determination R2 was 0.029. Therefore, about 2.9% of the variation in behaviors of leaders is explained by innovative technologies. The restriction parameter (F) was 11.329 for the behaviors of leaders caused by innovative

technologies.

H01.1: There is no impact of adopting innovative technologies and its variables (artificial intelligence, big data, the Internet of Things) on constructive leadership behaviors at $\alpha \leq 0.05$ in telecommunications companies.

To test this hypothesis, the researcher uses the multiple regression analysis to check the impact of adopting innovative technologies and its variables (artificial intelligence, big data, the Internet of Things) on constructive leadership behaviors at $\alpha \leq 0.05$ in telecommunications companies (Table 4).

Table 4 Multiple regression test to check the direct effect of adopting innovative technologies and its variables (artificial intelligence, big data, the Internet of Things) on constructive leadership behaviors

Dependent Variable	(R)	(R^2)	F calculated	DF	Sig*	B		T calculated	Sig*
Constructive leadership behaviors	0.360	0.130	19.062	3	0.000	Artificial intelligence	.131	2.628	.009
				384		Big Data	.059	1.126	.261
				387		The Internet of things	.347	7.074	.000

* The impact is significant at level $\alpha \leq 0.05$

Table 4 illustrates the significant impact of adopting innovative technologies and its variables (artificial intelligence, big data, the Internet of Things) on constructive leadership behaviors in telecommunications companies because the significant value was 0.000, less than 0.05. The R-value is the square root of the R-squared. The correlation between the observed and predicted values of the dependent variable was 0.360. The coefficient of determination R^2 was 0.130. Therefore, about 13.0% of the variation in constructive leadership behaviors is explained by innovative technologies and their variables (artificial intelligence, big data, the Internet of Things). The restriction parameter (F) was 19.062.

H01.2: There is no impact of adopting innovative technologies and its variables (artificial intelligence, big data, the Internet of Things) on destructive leadership behaviors at $\alpha \leq 0.05$ in telecommunications companies.

To test this hypothesis, the researcher uses the multiple regression analysis to check the impact of adopting innovative technologies and its variables (artificial intelligence, big data, the Internet of Things) on destructive leadership behaviors at $\alpha \leq 0.05$ in telecommunications companies (Table 5).

Table 5 Multiple regression test to check the direct effect of adopting innovative technologies and its variables (artificial intelligence, big data, the Internet of Things) on destructive leadership behaviors

Dependent Variable	(R)	(R^2)	F Calculated	DF	Sig*	B		T Calculated	Sig*
Destructive leadership behaviors	0.073	0.005	0.686	3	0.561	Artificial intelligence	.084	1.294	.196
				384		Big Data	.016	.231	.818
				387		The Internet of things	.034	.529	.597

* The impact is significant at level $\alpha \leq 0.05$

Table 5 illustrates no significant impact of adopting innovative technologies and its variables (artificial intelligence, big data, the Internet of Things) on destructive leadership behaviors in telecommunications companies because the significant value was 0.561, more than 0.05. The restriction parameter (F) was 0.686.

6. Discussion and Implication

The study sought to investigate the impact of adopting innovative technology on the behavior of leaders in Jordanian telecommunications companies. The focus was on constructive and destructive leaders. The study found that the adoption of innovative technology in telecommunications companies was high, and its impact on the behavior of leaders was different. The participation responses emphasized the impact of innovative technology on constructive leaders positively. On the other hand, innovative technology has had little effect on destructive leaders' behavior.

The results support Hypothesis 1 by showing that the extent of innovative technology adoption predicts constructive leadership behaviors. This result can be explained by the fact that constructive leaders seek to employ innovative technology in their practices to achieve a greater financial return and save time and effort for employees, thus achieving a significant competitive advantage. These findings are in line with findings reported in the broader leadership literature [24, 25] and show that technology adoption improves leaders' practices in companies.

Additionally, the adoption of innovative technology does not affect disruptive leaders' behavior. This leads to the conclusion that destructive leaders are charismatic, self-skilled, and highly energetic, especially as they have an obsession with power. However, the study shows that the destructive leader is authoritarian, ineffective, immoral, and incompetent, which reduces cohesion, encourages helplessness, frustration, tension, and despair among subordinates, and hinders the adoption of new strategies such as innovative technology, affecting performance. This finding supports the findings of several studies [7, 26]

that the destructive leader is moving away from modern strategies that threaten their position and image among their subordinates.

The findings contribute to the literature on innovative technology and highlight its impact on leader behaviors in decision-making for the emergence of new projects and their future market positioning [27]. Innovative technology is likely to help leaders in communications firms identify new markets, attract new customers, or enhance their ability to take advantage of specific industry innovations. As such, it is likely to help create a highly competitive advantage.

7. Scientific Novelty

This study contributes to the literature on innovation and modern technology in general and the literature on leadership behaviors and constructive and destructive leadership in particular. First, to the authors' knowledge, this study is the first to examine the impact of innovative technology on leaders' behaviors. Although customer needs and leader behaviors are among the main factors driving companies to develop their innovative technology capabilities, the research has focused on technology development, acquisition, and adoption capabilities without paying much attention to leaders' interaction and behavior in adopting these new technologies, especially since the decision to adopt them comes from the leader. Second, although the broader leadership and technology literature has provided some new insights into the direct impact of the interaction between leader behaviors and technology adoption, the results have often been inconclusive [28], [29]. Overall, the results of this study help explain the importance of shifting focus in organizations that rely on innovative technology from the detrimental impact of a disruptive leader on company sustainability and service improvement.

8. Limitations

There are many limitations to the study. First, the scope of the research is limited to carriers, thus reducing the generalizability of the results. In addition, from each case company, only employee representatives were included in the sample, providing a limited perspective. Moreover, only companies from Jordan were included in the sample. A final important limitation is that the nature of this research is exploratory. Hence, our findings are preliminary, and future research is needed to confirm our findings.

9. Conclusion

The current study is the first to explore the impact of innovative technology adoption on leaders' behavior by examining the impact of context on both their destructive and constructive leadership. The findings of our research study support the emerging theoretical position that innovative technology contributes to improving leaders' management practices and behaviors. Constructive leadership styles reduced stress and improved work processes (such as time management, collaboration, and response), resulting in higher performance. Destructive leadership increases the complexity of task execution and better customer service. This affected the entire organizational structure and created an imbalance in the conduct of the necessary procedures to obtain the service.

With technology, it is possible to achieve greater service quality. In this way, smart strategies and technologies pursued by the leader enhance the citizen's service faster and without errors. This means more than just paperwork reduction; it is a corporate reorganization and the potential application of new technologies in telecom companies. Furthermore, innovative technologies affect the storage and generation of critical data for decision-makers and stakeholders, which requires smart strategies for its management, exploitation, and security.

10. The Research Perspectives

In this study, the author further explored the key component factors that determined the challenges to successfully adopting innovative technologies in telecom companies. Theoretical foundations were extracted from the existing literature. Technology adoption frameworks were used for the study.

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