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Impact of Innovation on Competitive Advantage in Palestinian Telecommunications

Firas Alnasr[1], Taimaa Kharoub[2,*] & Aya Yahya[2,3]
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Abstract: Objective: This study aimed to establish that innovation is a major axis that supports the competitive advantage of telecommunications companies, enabling them to launch innovative products and services that meet and exceed customer expectations. It helps improve the quality of services, reduce costs, and exploit new market opportunities, such as new generation networks. Innovation also enhances flexibility and adaptability, which prepares companies to effectively meet market challenges. **Methods:** The study included a random sample of employees of Palestinian telecommunications companies out of 3,000 employees. 350 responses were collected through an electronic questionnaire and a personal interview, 341 of which were considered valid for statistical analysis. **Results:** The study shows that there is a weak positive relationship between innovation in self-risk and competitive advantage with a rate of 0.488. The relationship between product, process and technology innovation with competitive advantage is weak and positive. This study analyzes the impact of innovation in different dimensions (product, process, technology and self-risk) on companies' competitive advantage. "The study found that technological innovation explains 23.3% of competitive advantage, while process innovation accounts for 18.2%, product innovation contributes 6.1% to competitive advantage, and inherent risk innovation explains 23.8% of competitive advantage. The results show the importance of each of these dimensions in enhancing firms' competitive advantage to varying degrees. **Recommendations:** The researchers recommend that investments in R&D and fostering a culture of innovation are crucial to maintaining the competitive advantage of Palestinian telecom companies. They also emphasize the importance of improving technological infrastructure and developing team skills to support creativity and sustainable innovation.

Keywords: Innovation, Competitive advantage, Telecommunications companies, Palestine.

أثر الابتكار على الميزة التنافسية في قطاع الاتصالات الفلسطينية

فراس النصر[1]، وتيماء خروب[2،*]، وآية يحيى[2،3]

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الملخص: الهدف: هدفت هذه الدراسة إلى إثبات أن الابتكار يشكل محوراً رئيسياً يدعم الميزة التنافسية لشركات الاتصالات، مما يمكنها من إطلاق منتجات وخدمات مبتكرة تلبي وتتجاوز توقعات العملاء، ويساعد على تحسين جودة الخدمات وخفض التكاليف واستغلال فرص السوق الجديدة، مثل شبكات الجيل الجديد. كما يعمل الابتكار على تعزيز المرونة والقدرة على التكيف، مما يؤهل الشركات لمواجهة تحديات السوق بشكل فعال. الطرق: شملت الدراسة عينة عشوائية من موظفي شركات الاتصالات الفلسطينية من أصل 3000 موظف. وتم جمع 350 استجابة من خلال استبيان إلكتروني ومقابلة شخصية، اعتبرت 341 منها صالحة للتحليل الإحصائي. **النتائج:** أظهرت الدراسة أن هناك علاقة إيجابية ضعيفة بين الابتكار في المخاطر الذاتية والميزة التنافسية بمعدل 0.488. وأن العلاقة بين الابتكار في المنتج والعملية والتكنولوجيا بالميزة التنافسية ضعيفة وإيجابية. وتحلل هذه الدراسة تأثير الابتكار في أبعاد مختلفة (المنتج والعملية والتكنولوجيا والمخاطر الذاتية) على الميزة التنافسية للشركات. "توصلت الدراسة إلى أن الابتكار التكنولوجي يفسر 23.3% من الميزة التنافسية، في حين أن الابتكار في العمليات يشكل 18.2%، والابتكار في المنتجات يساهم بنسبة 6.1% من الميزة التنافسية، والابتكار في المخاطر الكامنة يفسر 23.8% من الميزة التنافسية. وتظهر النتائج أهمية كل من هذه الأبعاد في تعزيز الميزة التنافسية للشركات بدرجات متفاوتة. **التوصيات:** يوصي الباحثون بأن الاستثمار في البحث والتطوير وتعزيز ثقافة الابتكار أمر بالغ الأهمية للحفاظ على الميزة التنافسية لشركات الاتصالات الفلسطينية. كما يؤكدون على أهمية تحسين البنية التحتية التكنولوجية وتطوير مهارات الفريق لدعم الإبداع والابتكار المستدام.

الكلمات المفتاحية: الابتكار، الميزة التنافسية، شركات الاتصالات، فلسطين.

Introduction

The economic environment is marked by instability and rapid change, pushing institutions to innovate as a key strategy for competition. This drive for innovation, reflected in the quick introduction of new products and the emergence or decline of markets, is crucial for institutions aiming to increase or maintain their market share amidst these challenges (Al-Shahb,2017). Small and medium-sized enterprises (SMEs) are pivotal in stimulating economic recovery and expansion (Woźniak et.al,2019), and can propel nations towards enhanced competitiveness (Exposito & Sanchis-Llopis,2018). They serve as the backbone for their industries, nurturing dynamic commercial space sectors that stimulate innovation and support industrial development (Haryati et.al ,2021). SMEs are a crucial component of the global private sector (Rahman & Lodorfos, ,2017), with the economy and society relying on them (Hewitt & Van Rensburg ,2020). Various factors shape their strategies, impacting business development (Héraud,2021).

1 Communication and digital marketing department, Faculty of Business and Communication, An Najah National University, Nablus, Palestine. f.alnaser@najah.edu
2 MBA Program, An-Najah National University Nablus, Palestine.
*Corresponding author email: taimaakharoub@gmail.com.
3 E-mail: yahysaya4@gmail.com

1 قسم الاتصالات والتسويق الرقمي، كلية الأعمال والاتصال، جامعة النجاح الوطنية، نابلس، فلسطين. f.alnaser@najah.edu
2 برنامج ماجستير إدارة الأعمال، جامعة النجاح الوطنية، نابلس، فلسطين
*الباحث المراسل: taimaakharoub@gmail.com
3 بريد الكتروني: yahysaya4@gmail.com

Institutions now view innovation as vital for generating new products and markets, crucial for survival, growth, and gaining a competitive advantage. It's key to becoming an innovation-based entity and maintaining a sustainable competitive edge amidst intense competition and rapid technological changes (Kuncoro & Suriani,2018). The dynamic business environment, driven by technological changes and product variations, necessitates companies to adapt by selecting new strategies for competitiveness (Friesen Bichler & Reinstaller,2022; Liu & Wang ,2020). From a resource-based perspective, this highlights the need for enterprises to develop resources and capabilities for competitive advantage, with technology mastery being crucial for global market competition (Teece ,2018; Basset et.al,2018). Top of Form

This study highlights the critical role of innovation in developing organizational performance and its significance in ensuring a competitive advantage, which is vital for survival in today's competitive landscape. Specifically, it focuses on how innovation contributes to the competitive edge of communication companies and underscores the importance of the communication sector to the Palestinian GDP.

To strengthen the research gap, the literature can emphasize how different types of innovation—technological, process, and organizational—affect competitive advantage in distinct ways. For instance, while technological innovation may directly influence product quality and market differentiation, process innovation typically enhances operational efficiency and cost reduction. Organizational innovation, on the other hand, often leads to structural flexibility, improving adaptability and internal coordination.

Previous studies have explored these dimensions, but there is still room to investigate how each type of innovation interacts with specific market conditions, particularly within the context of Palestinian telecommunications companies. A comparative analysis of these impacts, aligned with specific company strategies, can highlight the nuanced roles innovation plays in achieving competitive advantage. This would establish a more precise research gap, exploring how varying innovation strategies directly influence competitiveness in different sectors, particularly under economic instability.

Moreover, digital transformation has a significant impact on the Palestinian telecommunications sector by enhancing efficiency and providing innovative services that meet customer needs. Digital innovation, such as adopting 5G and cloud computing technologies, contributes to improving competitive advantage. Regulatory changes, on the other hand, may hinder innovation if they impose restrictions on investment or slow down the adoption of new technologies. Conversely, regulatory policies that encourage innovation may push companies to adopt new technologies that contribute to improving performance and better meeting customer expectations.

The research investigates the role of innovation in boosting organizational competitiveness by adding value, improving efficiency, cutting costs, and introducing novel solutions for customer needs. It examines various innovation types—technological, process, and organizational—and their impact on competitive advantage. The aim is to demonstrate how innovation acts as a growth catalyst in competitive markets, focusing on efficiency, quality, and customer satisfaction. The study seeks to offer insights into effective innovation strategies for companies aiming to improve their competitive stance and sustainability.

Importance of Study

This study came to highlight that innovation is essential to improving company performance, as it affects product quality and operational efficiency indirectly rather than financial performance directly (Huang and Lee, 2018; Suhl and McCann, 2020). It is particularly important for small and medium-sized enterprises, as it acts as a key driver of competitiveness and performance enhancement (Kumar et al., 2021). The research emphasizes the importance of innovation in products, services, or processes to gain competitiveness in the market. This indicates that innovation is vital for growth, providing unique value, expanding the market, and improving efficiency, thus enhancing the competitive position of companies and ensuring their sustainable growth.

Study Objectives

1. The study aims to Identify the impact of innovation on achieving competitive advantage in Palestinian telecommunications companies
2. It aims to: More specifically
3. Present the theoretical basis for both innovation and competitive advantage.
4. Identify the impact of innovation on achieving competitive advantage in Palestinian telecommunications companies.
5. Provide a set of proposals and recommendations for Palestinian telecommunications companies on the impact of innovation on achieving competitive advantage.

Study Problem

With the opening of markets and the increase in global competition, the importance of innovation has increased, as institutions that do not give importance to developing new products and marketing them effectively are at risk of disappearing, which forces them to follow policies that may bring something new and work to attract the local consumer through quality and price. In light of the special developments in the world and the importance of keeping pace with them by modern organizations that aim to distinguish themselves from their peers through innovation, which is considered a great support for the organization's survival, growth and superiority over its competitors, therefore companies seek to reach advanced positions due to their distinctive innovation and using all means to achieve this. To achieve its competitive advantage among other companies.

Study Questions

Based on the above; The problem of the study revolves around the following main question: What is the impact of innovation on competitive advantage in the Palestinian telecommunications sector?

Study Hypotheses

This study addresses the contribution of innovation to the development of products and services, improving performance and increasing customer satisfaction, which enables companies to face market challenges and achieve sustainable growth. Figure (1) shows that we have assumed the following:

H0: There is no statistical significance impact of the effect of innovation on achieving competitive advantage in telecommunications companies at the significance level (0.05).

H1: There is no statistically significant impact of innovation in the product field on the competitive advantage in telecommunications companies at the significance level (0.05).

H2: There is no statistically significant impact on process innovation on the competitive advantage in telecommunications companies at the significance level (0.05).

H3: There is no statistically significant impact on Technological innovation on the competitive advantage in telecommunications companies at the significance level (0.05).

H4: There is no statistically significant impact on Innovation in self-risk on the competitive advantage in telecommunications companies at the significance level (0.05).

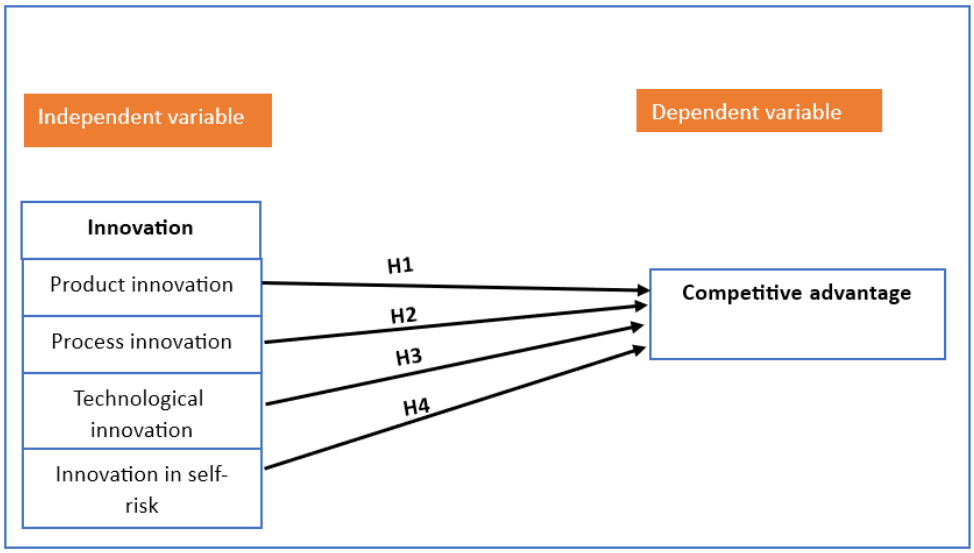

Figure (1): Study model.

Theoretical Aspect, Previous Studies and Developing Hypotheses (L.R)

The literature provided a theoretical review of the underlying theories, concepts, and constructs of this study, which helped in developing the theoretical model and formulating the hypotheses, which is the main goal of this study.

The study (Vijay,2023) highlights the importance of innovation management in sustaining competitive advantage, leading to unique products, increased efficiency, and improved financial performance. It emphasizes the need for a culture that supports innovation to maintain competitiveness in a dynamic business environment. Similarly, (Azeem,2021) examines the influence of organizational culture, knowledge sharing, and innovation on competitive advantage. Based on data from 294 industrial managers, the study finds that a supportive organizational culture promotes knowledge sharing and innovation, which significantly enhance competitive advantage. Both studies stress the role of culture in driving operational success.

The study (Farida & Setiawan ,2022) examines how business strategies influence competitive advantage in SMEs within construction and real estate, with performance and innovation as key mediators. Based on findings from 150 SMEs, it concludes that effective strategies enhance competitive advantage through improved performance and innovation. (Distanont & Khongmalai ,2020) explore the role of innovation in the competitive advantage of SMEs in the frozen food sector, finding that innovation, driven more by micro-level factors, is vital for adapting to economic changes. Both studies emphasize innovation's importance as a strategic tool for achieving competitive and sustainable development.

The study (Qabaja & Jaradat ,2020) focused on firms in Hebron, Palestine, and found that innovation plays a major role in achieving competitive advantage. Surveying 70 industrial leaders, they discovered that innovation explains 82.7% of changes in competitive advantage, with product and operational innovations being key contributors. The study recommends focusing more on innovation and fostering an environment that supports R&D. In another study (Zameer & Yasmeen ,2020), green competitive advantage in China's equipment manufacturing sector is explored. Findings show that a green brand image, driven by customer pressure, regulatory pressure, and green creativity, enhances competitive advantage, with a strong influence from green production and creativity.

Accordingly, innovation plays a crucial role in enhancing the competitive advantage of Palestinian telecommunications companies by providing new services and technologies that better meet custom (Sal23, 2023)er needs. Innovation in improving operational efficiency, developing new products, and exploiting modern technology enhances the ability to compete and survive in the market. Innovation also affects the ability of companies to excel in providing added value and reducing costs, which contributes to achieving a sustainable competitive advantage.

Innovation

Innovation is highly valued globally, especially by developed countries' governments, who see it as crucial for continuous research. It is considered the driving force behind human civilization and national progress, leading to social, cognitive, and intellectual advancement (Goffin & Mitchell,2017; Kahn,2018). Innovation is the process of generating a new idea and transforming it into a valuable business outcome, such as a product, technology, or service that meets a need and provides benefit at the individual or company level (Dziallas & Blind, 2019).

The evolution of innovation moved from an individual-centric approach in bureaucratic settings, which faced challenges like censorship and rigidity, to an organizational focus driven by competition. This led to inclusive strategies for fostering innovation, involving employee participation through work teams, suggestions, and visual management, affecting various organizational aspects from administration to company culture (Qabaja & Jaradat, 2020; Salah et.al., 2023).

Types of innovation

Two basic types of innovation can be distinguished (Demircioglu et.al,2019):

1. Product innovation: involves updating product specifications and features to better meet consumer needs and desires, introducing market offerings with new functionalities or usage conditions. Product innovation involves introducing a new product to the market with distinct characteristics, components, and consumer appeal. It includes developing new formulas, enhancing technological aspects, and refining presentation elements for the product's introduction.
2. Process innovation: encompasses changes in production methods to reduce costs and enhance performance. It involves adopting new methods, exploiting and developing processes, and integrating experiences to improve efficiency. This innovation aims to benefit both technically and economically, through investments in new technology or mastering current methods. The relationship between product and process innovation is intertwined, as changes in products may require adjustments in the production process
3. Technological innovation: aims to develop and enhance products, services, and processes through technology to improve daily life, boost efficiency, and foster economic and social growth.
4. Innovation in self-risk: involves using novel approaches to manage personal or organizational risks, aiming to enhance efficiency and cut costs through strategies like self-retention, technological risk analysis, and new business models to mitigate risk exposure.

Successful innovation in organizations depends on cooperation, creative thinking, effective implementation, and value enhancement, which together drive new ideas, execute strategies, and strengthen market position (Mathu & Berwa, 2017). Innovation occurs in three key dimensions: administrative innovation, which improves effectiveness through new practices (Fontana & Musa, 2017); technical innovation, focusing on technological advancements (Adekola & Sergi, 2016); and auxiliary innovation, which enhances customer satisfaction through additional services (Li et al., 2018).

Competitive advantage

In recent years, the topic of competitive advantage has received widespread attention at the global level. This is more than keeping pace with the requirements of the rapid developments that the world is witnessing, represented by the phenomenon of globalization and integration into the global economy, policies of openness and liberalization of markets, in addition to the tremendous developments in information and communications technology. Competitive advantage is the unique characteristic that sets a company apart from its rivals due to its resources and capabilities, leading to a strong market position and distinctive value in its offerings (Masa'd, & Aloqaily, 2022). This advantage enables the organization to achieve higher returns by creating value for customers through cost-effective solutions or unique product benefits, ultimately fostering long-term success and differentiation in the market (Trivedi & Srivastava ,2022).

Competitive advantage is essential for organizational growth, offering superiority over competitors, enhancing performance, and improving customer offerings (Arslan, 2020). It influences perceptions, ensures continuity, and fosters dynamic internal operations. Key methods to achieve competitive advantage include superior efficiency, quality, innovativeness, and customer responsiveness. Efficiency involves high productivity through effective strategies and control systems. Quality focuses on meeting customer expectations, building a strong reputation, and reducing defects. Innovativeness is about introducing new products or methods, while customer responsiveness requires understanding customer needs, diversifying products, and adapting to market changes (Sharafuddin, 2017: Singh& Kundu ,2023).

Dimensions of competitive advantage

Understanding the dimensions of competitive advantage according to (Porter, 2011) is crucial for businesses aiming to lead in their markets. These dimensions include:

1. Cost Leadership: Achieving the lowest production costs to offer competitive prices or higher profit margins, requiring continuous optimization of production, procurement, and overhead costs.
2. Quality: Surpassing customer expectations, fostering market excellence, and building loyalty through high standards, innovation, efficient production, and continuous improvement across the customer journey.
3. Flexibility: It is vital for organizations to respond rapidly to changes, including tailoring products to meet customer needs. It forms the basis for achieving competitive advantage by enabling organizations to adapt operations, methods, and strategies to evolving challenges and competitive environments. Continuous development is key to success in maintaining competitiveness.
4. Delivery to customers: Meeting customer needs promptly and effectively, ensuring high service quality, and resolving inquiries and issues quickly to boost customer loyalty, reduce churn rates, and enhance market reputation. Top of Form

Innovation serves as a critical foundation for achieving competitive advantage, enabling companies to distinguish themselves and excel in the market. Through new products, services, or process improvements, companies can uniquely address customer needs, adding value and differentiating themselves from competitors. Innovation enhances product quality, reduces costs, increases efficiency, and strengthens market position, ensuring long-term success. Investing in research and development and fostering an innovative culture within organizations are key strategies for sustaining growth and navigating the ever-changing business landscape.

Methodology

Study population and sample

The study population consists of employees in Palestinian telecommunications companies, with a total of 3000 employees. The sample size of 341 was taken based on a previous study to determine the sample size (Krejcie & Morgan, 1970). 350 responses were collected through an electronic questionnaire and a personal interview, 341 of which were considered valid for statistical analysis.

Study tool

The questionnaire consists of two sections, the first section contains the demographic characteristics of employees such as gender, educational level, and experience, and the second section consists of the dimensions of innovation and competitive advantage. The four dimensions of innovation contain 19 elements adapted from a previous study (Qabaja & Jaradat, 2020), while competitive advantage contains 7 elements adapted from a previous study (Qabaja & Jaradat, 2020; Rasha Harith Abboud, 2017). Each item was measured on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire was distributed in Arabic and was converted into English using statistical analysis.

Characteristics of the study sample

Table (1) shows the demographic characteristics of the employees, where the percentage of females reached 54%, slightly higher than the percentage of males, 46%, due to the increase in the number of females in the telecommunications company. As for Paltel, its percentage of 49.3% is higher than Jawal percentage of 29% and Hadara percentage of 21.7% because the number of employees is more in Paltel company. Furthermore. 7.6% of employees have a high school diploma, 25.2% of them have a diploma, 54.5% of employees have a bachelor's degree, and 0.9% of employees have a doctorate degree. Whereas the years of experience among employees are 39.9% less than 3 years, 46.3% 3-10 years, and 14.1% more than 10 years.

Table (1): Distribution of sample members according to demographic characteristics of employees.

Demographic Characteristics	Frequency	Percentage(%)
Identify the company		
Jawwal	99	29.0
Paltel	168	49.3
Hadara	74	21.7
Gender		
Male	157	46.0
Female	184	54.0
Educational level		
Secondary school	26	7.6
Diploma	86	25.2
Bachelor's	186	54.5
Master's	40	11.7
Ph.D	3	0.9
Experience		
Less than 3 years	135	39.9
3-10 years	158	46.3
More than 10 years	48	14.1

Validity of the tool

To verify the validity of the tool, a questionnaire was presented, taken from previous studies, and the items were taken and modified for the purpose of reviewing them and verifying the validity of their content. A questionnaire was distributed in Palestinian telecommunications companies.

To measure the stability of the tool, the study used the Cro-Nebach alpha coefficient, and the results were as shown in the table (2).

Table (2): Cronbach's alpha coefficient for the independent and dependent variables.

Variable	Number of paragraphs	Cronbach alpha
Innovation	19	0.836
Product innovation	6	0.786
Process innovation	5	0.739
Technological innovation	4	0.813
Innovation in self-risk	4	0.759
Competitive advantage	7	0.821

Overall index 0.878

The overall index of reliability of the study tool was 0.878, as shown in the table, which means the possibility of adopting the results of a tool and being confident in its credibility in achieving the objectives of the study.

Statistical analysis

To reach the results of the study and test the validity of the hypotheses, Spss was used through the questionnaire data.

Descriptive analysis of the study variables

Table (3): Descriptive statistics analysis of variables.

Statistics						
		Product innovation	Process innovation	Technological innovation	Innovation in self-risk	Competitive advantage
N	Valid	341	341	341	341	341
	Missing	0	0	0	0	0
Mean		4.3772	4.2358	4.2793	4.3094	4.3081
Std. Deviation		.49301	.57885	.57030	.50617	.44827
Minimum		1.00	2.60	1.00	1.50	2.57
Maximum		5.00	5.00	5.00	5.00	5.00

Table (3) shows the arithmetic mean and standard deviations for the study variables. The arithmetic averages of the innovation dimensions ranged between (4.2 - 4.3), with a very high rating. Product innovation received the highest mean of 4.37 and a very high response rate, followed by innovation in self-risk with a mean of 4.30 and a very high response rate. Technological innovation had a mean of 4.27, and process innovation had a mean of 4.23, with a very high response rate. As for competitive advantage, the arithmetic mean is 4.30, with a very high response rate, and the results are consistent with previous studies (Qabaja & Jaradat, 2020; Rasha Harith Abboud, 2017).

Correlation analysis

Table (4): Pearson correlation matrix between study variables.

Correlations					
	Product innovation	**Process innovation**	**Technological innovation**	**Innovation in self-risk**	**Competitive advantage**
Product innovation	1				
Process innovation	0.201	1			
Technological innovation	0.214	0.406	1		
Innovation in self-risk	0.167	0.416	0.457	1	
Competitive advantage	0.248	0.426	0.482	0.488	1

Table (4) shows the Pearson correlation coefficient analysis, which shows the correlation matrix between the independent variables and the dependent variable of the study. There is a weak positive relationship between innovation in self-risk and competitive advantage at a rate of 0.488. While the correlation coefficient between product innovation, process innovation, technological innovation and the relationship with competitive advantage is considered a weak positive relationship. However, in Palestinian telecom companies, the weak link between innovation and competitive advantage may be due to several factors, such as weak investment in research and development, regulatory and political challenges, and insufficient uptake of new technologies. This weakness can reduce companies' ability to excel in the market, making them less competitive compared to regional and international companies. To improve this situation, the innovation environment must be strengthened by improving infrastructure, easing regulations, and increasing investment in technology.

Regression analysis and hypothesis testing

To test the validity of the study hypotheses and determine the effect of innovation on achieving competitive advantage in Palestinian telecommunications companies, a linear and multiple regression model was used, and the results of the regression analysis were:

First hypothesis: There is no statistically significant effect of innovation in the product field on the competitive advantage in telecommunications companies at the significance level (0.05).

Table (5): The strength of the connection between product innovation & competitive advantage.

Model Summary				Std. Error of the Estimate
Model	**R**	**R Square**	**Adjusted R Square**	
1	.248a	.061	.059	.43492

a. Predictors: (Constant), Product innovation

Table (6): Regression analysis between product innovation & competitive advantage.

Coefficientsa						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	3.322	.211		15.762	.000
	Product innovation	.225	.048	.248	4.711	.000

a. Dependent Variable: Competitive advantage

Tables (5,6) shows the effect of the relationship between product innovation and competitive advantage, as statistical analysis showed that the correlation coefficient is 0.248, as the relationship between the two variables is weak and positive.

The adjusted R-square was 6.1%, which means that product innovation explains 6.1% of the competitive advantage. The value of the effect score (slope of the regression equation β) was 0.225. This means that the value of beta is positive, and this means that increasing one unit of innovation in the product leads to an increase in competitive advantage by 22.5% of this unit, and this affects that the company works on new products or better products with high quality that achieve additional profits and thus maintain the advantage. And its development. The T value was 4.711, which is not significant at the significance level (0.05 > a). This is confirmed by the fact that the Sig of F is equal to 0.000, and this value is less than the significance level (0.05 > a). We reject the null hypothesis and accept the alternative hypothesis.

This result is attributed to the fact that innovation in the product field leads the company to create new products of high quality that achieve additional profits, compared to the costs of inputs, and this is due to its uniqueness in the advantage of new products, and thus maintaining or developing the highest advantage of distinction.

Second hypothesis: There is no statistically significant effect of innovation in the product field on the competitive advantage in telecommunications companies at the significance level (0.05).

Table (7): The strength of the connection between Process innovation & competitive advantage.

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.426a	.182	.179	.40612

a. Predictors: (Constant), Process innovation.

Table (8): Regression analysis between Process innovation& competitive advantage.

Coefficientsa						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	2.910	.163		17.891	.000
	Process innovation	.330	.038	.426	8.674	.000

a. Dependent Variable: Competitive advantage

Tables (7,8) shows the effect of the relationship between process innovation and competitive advantage, as statistical analysis showed that the correlation coefficient is 0.426, as the relationship between the two variables is weak and positive.

The adjusted R-square was 18.2%, which means that process innovation explains 18.2% of the competitive advantage. The value of the effect score (slope of the regression equation β) was 0.426. This means that the value of beta is positive, and this means that increasing one unit of innovation in the process leads to an increase in competitive advantage by 42.6% of this unit, and this affects that the company is working on new advantages to the current process or current product by adding new components or new development. To the process, it leads to improving its quality, ease of use, and improving its design, and this achieves a competitive advantage. The T value was 8.674, which is not significant at the significance level (0.05 > a). This is confirmed by the fact that the Sig of F is equal to 0.000, and this value is less than the significance level (0.05 > a). We reject the null hypothesis and accept the alternative hypothesis.

This result is attributed to the fact that process innovation leads a company to add new or improved features to an existing process or product, by adding a new component, or developing a new process, which leads to its improvement, adding new names, or improving its design, quality level, ease of use, or suitability for purpose; which gives it a competitive advantage.

Third hypothesis: There is no statistically significant effect on Technological innovation on the competitive advantage in telecommunications companies at the significance level (0.05).

Table (9): The strength of the connection between Technological innovation & competitive advantage.

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.482a	.233	.230	.39325

a. Predictors: (Constant), Technological innovation.

Table (10): Regression analysis between Technological innovation & competitive advantage.

Coefficientsa						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	2.686	.161		16.635	.000
	Technological innovation	.379	.037	.482	10.139	.000

a. Dependent Variable: Competitive advantage.

Tables (9,10) shows the effect of the relationship between technological innovation and competitive advantage, as statistical analysis showed that the correlation coefficient is 0.482, as the relationship between the two variables is weak and positive.

The adjusted R-square was 23.3%, which means that technological innovation explains 23.3% of the competitive advantage. The value of the effect score (slope of the regression equation β) was 0.482. This means that the beta value is positive, which means increasing one unit of technological innovation leads to an increase in competitive advantage by 48.2% of this unit. This affects that the company works to develop products, services, and processes through technology. It enhances efficiency, improves daily life, and supports growth. Economic and social. This makes for a competitive advantage. The T value was 10.139, which is not significant at the significance level (0.05 > a). This is confirmed by the fact that the Sig of F is equal to 0.000, and this value is less than the significance level (0.05 > a) .We reject the null hypothesis and accept the alternative hypothesis.

This result is attributed to the fact that technological innovation enhances competitive advantage by improving operational efficiency and providing innovative products and services that meet market needs faster and better. It also allows for cost reductions and increased quality, giving companies greater ability to differentiate themselves in the market.

Fourth hypothesis: There is no statistically significant effect on Innovation in self-risk on the competitive advantage in telecommunications companies at the significance level (0.05).

Table (11): The strength of the connection between Innovation in self-risk & competitive advantage.

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.488a	.238	.236	.39192

a. Predictors: (Constant), Innovation in self-risk

Table (12): Regression analysis between Innovation in self-risk & competitive advantage.

Coefficients a						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	2.447	.182		13.430	.000
	Innovation in self-risk	.432	.042	.488	10.285	.000

a. Dependent Variable: Competitive advantage

Table (11,12) shows the effect of the relationship between innovation on self-risk and competitive advantage, as statistical analysis showed that the correlation coefficient is 0.488, as the relationship between the two variables is weak and positive.

The adjusted R-square was 23.8%, which means that innovation in self-risk explains 23.8% of the competitive advantage. The value of the effect score (slope of the regression equation β) was 0.488. This means that the value of beta is positive, and this means that an increase of one unit of innovation in self-risk leads to an increase in competitive advantage by 48.2% of this unit, and this affects that the company is working on using new methods and strategies for

risk management aimed at improving efficiency and reducing costs. This makes for a competitive advantage. The F value was 10.285, which is not significant at the significance level (0.05 > a). This is confirmed by the fact that the Sig of F is equal to 0.000, and this value is less than the significance level (0.05 > a). We reject the null hypothesis and accept the alternative hypothesis.

This result is due to the fact that innovation associated with intrinsic risks can enhance competitive advantage, but it carries internal risks such as high costs or failure to adapt to technical changes. This type of innovation may disrupt existing operations, but if implemented correctly, it can give a company a significant advantage in the market by offering unique and difficult-to-imitate solutions.

Also, there are four hypotheses when analyzing the regression. The results are consistent with previous studies (Qabaja & Jaradat, 2020; Rasha Harith Abboud, 2017; Abou-Moghli et.al ,2012).

Conclusion

The study highlights the importance of innovation in enhancing the competitiveness of organizations by improving efficiency, reducing costs, and providing innovative solutions to meet customer needs. It addresses different types of innovation - technological, process, and organizational - and their impact on competitive advantage, emphasizing the role of innovation as a driver of growth in a competitive market, with an emphasis on efficiency, quality, and customer satisfaction. The aim of the study is to provide effective innovation strategies for companies seeking to improve and sustain their competitive position.

The study highlights the demographic distribution of telecom company employees, focusing on gender, education, and experience. It shows that females outnumber males in the parent company, with differences in subsidiaries, and Paltel has the highest female proportion. Most employees hold a bachelor's degree, with varied experience levels, reflecting diverse educational and professional backgrounds. The analysis shows high ratings for all innovation dimensions, with product innovation ranked highest, followed by self-risk, technological, and process innovation. Competitive advantage is also rated highly, though the relationships between innovation dimensions and competitive advantage are positive but weak, suggesting room for improvement.

Despite this, the factors that contribute to the weakness of the positive relationships revealed in this study can be identified by the organizational culture that supports innovation, such as creative incentives and internal collaboration. Market conditions, such as the increasing demand for new technology, and the external environment, such as political and regulatory challenges, may also limit or enhance these relationships by providing a favorable environment for adopting innovation. Improving these factors can turn this relationship into a driving force for increasing competitiveness and responding to market changes more effectively.

This study analyzed the impact of innovation across various dimensions (product, process, technology, and intrinsic risk) on competitive advantage. Product innovation contributed 6.1%, with a 22.5% increase in competitive advantage for each improvement. Process innovation explained 18.2% of competitive advantage, with a 42.6% boost for every increase. Technological innovation accounted for 23.3%, enhancing competitive advantage by 48.2%. Innovation in intrinsic risk contributed 23.8%, also increasing competitive advantage by 48.2%. The F values indicated strong statistical significance, confirming that innovation in these areas significantly enhances companies' competitive advantage.

Accordingly, innovation plays a pivotal role in enhancing the competitive advantage of Palestinian telecom companies, as it contributes to improving service quality, reducing costs, and meeting changing customer needs. Case studies from other regions such as telecom companies in South Korea and Japan have shown how they have used technological innovation (such as 5G) to improve connectivity speeds and enhance user experience, resulting in significant competitive advantage. In India, telecom companies have embraced operational innovation to improve efficiency and reduce costs, helping them compete on price and attract more customers.

Innovation is key to boosting the competitive advantage of Palestinian telecommunications companies by enabling the development of new products and services that meet customer needs in creative ways. It also improves operational efficiency through the adoption of new technologies and methods, helping companies stand out and respond more effectively to technological changes and customer preferences. Innovation further allows companies to explore new markets and growth opportunities, enhancing long-term competitiveness. Success in these areas depends on effectively implementing innovation strategies, investing in research and development, and adapting to rapid market and technological changes.

Recommendations

Based on the results of the previous study, the researchers recommend:

1. Enhance competitive advantage through innovation in Palestinian telecommunications companies.
2. Strategies should focus on fostering a culture of innovation, increasing R & D investment, and building partnerships with academic and technological institutions.
3. Companies should prioritize understanding customer needs, improving technological infrastructure, developing team creativity, and ensuring readiness to adapt to market changes, with a focus on sustainable innovation for long-term success and social responsibility.
4. Promote sustainable growth and competitive market positioning through seminars, skill development courses, and increased R & D investment.
5. It suggests conducting more studies on innovation using different variables and comparing the public and private sectors for a deeper understanding of the impact of innovation.

Limitation and Future Research

The study on the impact of innovation on competitive advantage in Palestinian telecommunications companies faces limitations, such as limited data on innovation and challenges in accessing technology development information, affecting analysis accuracy. Additionally, the unique Palestinian market and its economic and political environment hinder result generalization. A lack of qualified human resources in innovation also limits the full use of technological potential. Future research should focus on modern innovations like cloud technology and the Internet of Things, conduct comparative studies with similar markets, and explore long-term innovation effects on efficiency and product development. External factors affecting innovation's impact should also be analyzed.

Disclosure Statement

- **Ethical approval and consent to participate:** This study was conducted in accordance with ethical guidelines, and informed consent was obtained from all participants involved.

- **Availability of data and materials:** The data supporting the findings of this study are available from the corresponding author upon request.
- **Author contribution:** (Abe22, 2022) Author 1 (Firas Alnasr) selected the study title and then reviewed and modified the manuscript; Author 2 (Taimaa Kharoub) developed the study idea, wrote the manuscript, contributed to data analysis, reviewed and modified the manuscript; Author 3 (Aya Yahya) contributed to writing the manuscript and data collection. All authors approved the final version.
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