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The Role of Service Innovation Readiness Dimensions in Enhancing Competitive Performance A Case Study in Operations and Logistics of Oil and Gas Techniques Engineering College / Kirkuk

Waleed Ali Hussein Al-Zaidi
Northern Technical University - College of Oil and Gas Techniques Engineering
dr.waleedah199@ntu.edu.iq

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*Corresponding author:
Waleed Ali Hussein Al-Zaidi
Northern Technical University

Abstract:

The current study aims to explain the contribution of service innovation readiness (SIR) dimensions in enhancing competitive performance through a case study in operations and logistics of Oil and Gas Techniques Engineering College - Kirkuk. The study adopted a descriptive-analytical approach, developing a questionnaire specifically designed to measure the six dimensions of service innovation readiness: Strategic Investment, Risk Tolerance, Service Innovation Champions, Inter-organizational Collaboration, Service Innovation Experience, and Information Technology Experience and competitive performance, which consists of five dimensions: Financial and Resource Growth, Expansion and Institutional Growth, Market Position & Demand, Competitive Advantage and Reputation, and Research and Innovation Competitiveness. Additionally, secondary data have been used in conjunction with the questionnaire. The study problem lies in the ambiguity of the relationship between service innovation readiness dimensions and competitive performance in the education sector. The study employed a comprehensive sampling method, distributing the questionnaire to all teaching staff at the college. A total of 37 questionnaires were distributed, covering all teaching staff, and all were returned and deemed valid for analysis. The study results showed that the level of service innovation readiness and competitive performance tended to be positive among the sample. Correlation results indicated a strong, statistically significant relationship between service innovation readiness and competitive performance at the overall level, as well as a significant relationship between each dimension of service innovation readiness and competitive performance. Simple linear regression analysis revealed a significant effect of service innovation readiness on overall competitive performance. At the sub-level, regression models demonstrated a statistically significant relationship between each dimension of service innovation readiness and competitive performance, with IT Experience, Inter-organizational Collaboration, and Service Innovation Experience showing a clear advantage as the most influential dimensions.

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دور ابعاد جاهزية ابتكار الخدمة في تعزيز الأداء التنافسي
دراسة حالة في عمليات وامدادات كلية هندسة تقنيات النفط والغاز – كركوك

د. وليد علي حسين الزيدي
الجامعة التقنية الشمالية ـ كلية هندسة تقنيات النفط والغاز
dr.waleedah199@ntu.edu.iq

المستخلص

تهدف الدراسة الحالية إلى توضيح مساهمة أبعاد جاهزية ابتكار الخدمة في تعزيز الأداء التنافسي من خلال دراسة حالة في العمليات واللوجستيات في كلية هندسة تقنيات النفط والغاز ـ كركوك. اعتمدت الدراسة منهجًا وصفيًا تحليليًا، حيث طُوِّر استبيان مصمم خصيصًا لقياس ستة أبعاد لجاهزية ابتكار الخدمة: الاستثمار الاستراتيجي، وتقبُّل المخاطر، ورواد ابتكار الخدمة، والتعاون بين المنظمات، والخبرة في ابتكار الخدمة، والخبرة في تكنولوجيا المعلومات، بالإضافة إلى قياس الأداء التنافسي، الذي يتكون من خمسة أبعاد: النمو المالي ونمو الموارد، والتوسع والنمو المؤسسي، والمكانة السوقية والطلب، والميزة التنافسية والسمعة، والقدرة التنافسية في البحث والابتكار. بالاضافة الى استخدام بيانات ثانوية الى جانب الاستبيان.

تكمن مشكلة الدراسة في غموض العلاقة بين أبعاد جاهزية ابتكار الخدمات والأداء التنافسي في قطاع التعليم.

استخدمت الدراسة أسلوب المعاينة الشاملة، حيث وُزِّع الاستبيان على جميع أعضاء هيئة التدريس في الكلية. حيث وزع ما مجموعه 37 استبيانًا، شملت جميع أعضاء هيئة التدريس، وقد استُردَّت جميعها واعتُبرت صالحة للتحليل.

أظهرت نتائج الدراسة أن مستوى جاهزية ابتكار الخدمة والأداء التنافسي كان إيجابيًا بشكل عام في العينة. أشارت نتائج الارتباط إلى وجود علاقة قوية وذات دلالة إحصائية بين جاهزية الابتكار في الخدمات والأداء التنافسي على المستوى العام، بالإضافة إلى وجود علاقة ذات دلالة إحصائية بين كل بُعد من أبعاد جاهزية الابتكار في الخدمات والأداء التنافسي. وكشف تحليل الانحدار الخطي البسيط عن تأثير كبير لجاهزية الابتكار في الخدمات على الأداء التنافسي العام. وعلى المستوى الفرعي، أظهرت نماذج الانحدار وجود علاقة ذات دلالة إحصائية بين كل بُعد من أبعاد جاهزية الابتكار في الخدمات والأداء التنافسي، حيث أظهرت خبرة تكنولوجيا المعلومات، والتعاون بين المنظمات، وخبرة الابتكار في الخدمات ميزة واضحة باعتبارها الأبعاد الأكثر تأثيرًا.

الكلمات المفتاحية: الجاهزية لابتكار الخدمات، الأداء التنافسي، الخدمات اللوجستية، التعليم، الجامعة، الكلية، ابتكار الخدمات.

1- Introduction

Lately, the competition among organizations in general, and service organizations in particular, has intensified sharply, prompting many service organizations to seek ways to enhance their competitive position. The education sector is one of the most affected service sectors, leading to a reassessment of its performance and a focus on key areas that strengthen its competitive edge, such as securing funding and grants, establishing partnerships, building academic reputation, and improving the quality of educational services. Most universities strive to enhance their

competitive performance by improving their educational services (Bileviciute et al., 2019).

Searching for robust determinants to enhance competitive performance has become a priority for universities and colleges in the education sector. Among the most important of these determinants is service innovation readiness, which effectively contributes to the renewal of educational services through its key dimensions: strategic investment, risk tolerance, service innovation champions, inter-organizational collaboration, service innovation experience, and information technology experience (Yen et al., 2012).

The introduction includes a detailed presentation of the study problem, which shows the research gap and the most important questions of interest to the study, and a statement of the importance of the study in the Iraqi academic environment, and the identification of the main objectives of the study, as well as building the hypothetical model of the study and formulating the hypotheses that represent the analytical basis on which the study relies in testing the relationships between the dimensions.

1-1- The Study Problem

In a context of intense competition among educational institutions and the desire of academic leaders to enhance their competitive performance, the research problem arose from the need to identify the key factors influencing the performance of educational institutions. A review of the previous literature revealed a lack of discussion on the relationship between service innovation readiness dimensions and competitive performance in the education sector, particularly in relation to educational processes and logistics. Furthermore, interviews conducted with college leaders revealed a limited understanding of these dimensions and their role in the college's competitive performance.

Based on the above, the following questions can help clarify the research problem:

1. What is the level of availability of service innovation readiness dimensions at the college?
2. What is the college's level of competitive performance across these dimensions?
3. Is there a relationship between service innovation readiness dimensions and competitive performance?
4. Which service innovation readiness dimensions have the greatest impact on competitive performance?
5. What practical recommendations can be made for the college?

1-2- The Importance of Study

The significance of this research stems from its contribution to the Iraqi academic environment by examining the relationship between the dimensions of service innovation readiness and competitive performance. It enriches the literature by applying service innovation readiness dimensions to operations and supply chain management within the Iraqi educational environment. In addition, providing an accurate assessment of the service innovation readiness and competitive

performance in the college under study, identifying weaknesses, and offering recommendations for addressing them.

1-3- The Aim of Study

This study aims to determine the correlation and impact between the dimensions of service innovation readiness and competitive performance in the operations and logistics of Oil and Gas Techniques Engineering College, Kirkuk. From this main objective, the study's goals can be outlined as follows:

1- Describing and diagnosing the dimensions of service innovation readiness and competitive performance within the college under study.
2- Identifying the nature of the relationship between service innovation readiness and its dimensions, and their relationship to competitive performance.
3- Developing and testing a Hypothetical Study Model.

1-4- Hypothetical Study Model

The hypothetical study model illustrates the logical relationship between the study variables, as shown in Figure (1).

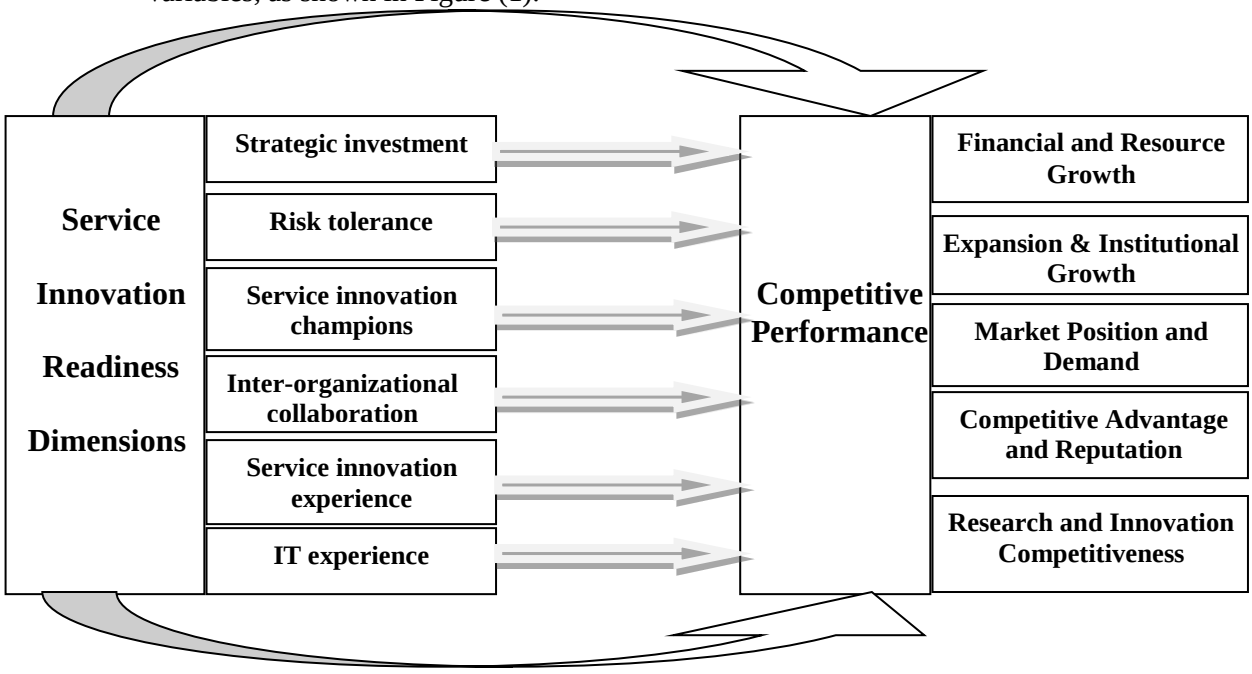

Figure 1. Theoretical relationship between study dimensions
Source: Authors' own

1-5- Study Hypotheses

The study model reveals two main hypotheses:
The first one is:
H1: There is a statistically significant correlation between the dimensions of service innovation readiness combined and competitive performance.

Sub-hypothesis stem from this:
H1a: There is a statistically significant correlation between each dimension of service innovation readiness and competitive performance.
The second one is:
H2: There is a statistically significant effect of the combined service innovation readiness on competitive performance.
Sub-hypothesis stem from this:
H2a: There is a statistically significant effect of each dimension of service innovation readiness on competitive performance.

2- The Study Methodology

This study employs a descriptive-analytical research methodology within a case study framework. It aims to diagnose the current state of service innovation readiness within educational institutions and analyze its impact on competitive performance. This methodology also allows for the examination of the relationship between variables and an understanding of the extent to which service innovation readiness affects the processes and logistics of educational institutions, ultimately impacting their competitive performance. The study methodology includes the study population, Sample, and Justifications for selection; Study boundaries; data collection method; and a questionnaire description.

2-1- Study population, Sample, and Justifications for selection

Regarding the research population and sample, Oil and Gas Techniques Engineering College/ Kirkuk was selected as the study population, which consists of two departments: the Fuel and Energy Techniques Engineering Department and the Renewable Solar Techniques Engineering Department. The research sample consisted of the college's teaching staff, given their greater familiarity with the college's processes and logistics. All teaching staff at the college were chosen as the sample for several reasons, most importantly because they constitute the group most directly involved in the services provided within the college, given their direct interaction with students from registration to graduation. They also possess sufficient knowledge regarding innovation and research. Additionally, they are the key players in implementing and developing educational services. Furthermore, using a comprehensive approach for the study sample ensures a representative sample of the study population, leading to more objective responses to the questionnaire.

2-2- Study boundaries

The study was conducted at the Oil and Gas Engineering Technology College - Kirkuk, from October to February. The study was also supported by administrative data, which includes student numbers and college revenue to aid in interpreting the survey results.

2-3- Data collection method

A questionnaire was used to collect data, based on a five-point Likert scale (1= Strongly Disagree to 5 = Strongly Agree). It included two main variables: Service

Innovation Readiness with its six dimensions (Strategic investment, Risk tolerance, Service Innovation Champions, Inter-organizational collaboration, Service Innovation experience, and Information Technology experience (IT experience)), and Competitive Performance with its five dimensions (Financial and Resource Growth, Expansion and Institutional Growth, Market Position and Demand, Competitive Advantage and Reputation, and Research and Innovation Competitiveness). The researcher used a census approach, distributing the questionnaire to all 37 faculty members of the college. All 37 questionnaires were returned, representing a 100% response rate. Statistical analyses were conducted using descriptive statistics (means, standard deviations, agreement ratios, neutrality, and disagreement ratios) at the indicator and dimension levels, in addition to internal reliability testing using Cronbach's alpha coefficient. In order to test relationships and effects, Pearson correlation coefficients and regression were used to examine the service innovation readiness effect and its dimensions on competitive performance. Additionally, data were collected related to the number of student admissions for three-year programs, both morning and evening study, which were also used, along with relevant research data, to support or refine the questionnaire. To ensure the questionnaire's ability to measure the study variables, a face validity test was conducted on the questionnaire items after their preparation. This was done by presenting them to a group of expert arbitrators to verify the accuracy of the indicators and their suitability for the study hypotheses. All observations were taken into account, and the indicators were modified to align with the study's dimensions.

2-4- Questionnaire Description

This study relied on a structured questionnaire as its primary data collection tool. It was designed to measure two key variables: service innovation readiness and competitive performance at the College of Petroleum and Gas Engineering Technology in Kirkuk. The items were formulated in clear and direct language suitable for educational institutions.

The questionnaire consisted of 55 indicators distributed across two main parts, as shown in the table (1) below.

Table 1: Study Dimensions in Questionnaire

Main Dimensions	Sub- Dimensions	Measurement Indicators	Scale Code	Cronbach Alpha
Service Innovation Readiness	Strategic investment	1-5	X1-X5	0.93
	Risk tolerance	6-10	X6-X10	0.83
	Service Innovation Champions	11-15	X11-X15	0.91
	Inter-organizational collaboration	16-20	X16-X20	0.89
	Service Innovation experience	21-25	X21-X25	0.89
	Information Technology experience	26-30	X26-X30	0.92
Competitive Performance	Financial and Resource Growth	31-35	X31-X35	0.81
	Expansion and Institutional Growth	36-40	X36-X40	0.83
	Market Position and Demand	41-45	X41-X45	0.88
	Competitive Advantage and Reputation	46-50	X46-X50	0.90
	Research and Innovation Competitiveness	51-55	X51-X55	0.92

Source: author's own compilation

3- Theoretical Part

3-1- Operations and Logistics in Educational Institutions

Logistics of educational institutions is the ability to manage the flow of inputs (student, course, assessment), processes (teaching process, learning environment, infrastructure, information systems, and technology), and information that contribute to the efficient and reliable delivery of educational services, similar to the logistics or supply chains of other services and production sectors, but with a focus on the academic environment. Educational logistics in higher education is particularly distinct from other services as it is linked to (information management, research, teaching load planning, planning and scheduling, management of halls or spaces and infrastructure, and related technology) and the management and development of these logistical activities in innovative ways that enhance the competitive performance of the college (Wansavatkul, 2013).

The integration and connection between administrative bodies within the college (academic departments, divisions, units) and all relevant external suppliers and partners is achieved through administrative systems to reduce waste and duplication and improve cost, time, and the quality of outputs (Lau, 2007).

Colleges achieve competitive performance through a combination of considerations including, student recruitment, reputation, funding, partnerships, research and innovation, and sustainability. From a strategic perspective, competitiveness is not merely about operational improvements, but about selection and differentiation that translates into various values, maximizing benefits for beneficiaries and stakeholders (Porter, 1996).

3-2- Service Innovation Readiness Dimensions

Service innovation is a crucial aspect of businesses in today's world, as it allows organizations to provide more value to their customers and stay competitive in the marketplace. According to (Ostrom et al. 2010), Service innovation refers to the practices of “creating value for customers, employees, business owners, alliance partners, and communities through new and/or improved service offerings, service processes, and service business models.

"Service innovation" has become a term for innovations that occur in various areas, whether in services or non-services sectors, such as by manufacturing companies that want to add value-added services to their portfolio. Service innovation aims to introduce new services or the incremental improvement of existing services (Miles, 2008).

Service innovation can be an effective way to create a sustainable competitive advantage for a business. Shifting to or assuming service strategies can help organizations overcome the problem of sustaining growth in saturated markets, as well as the problem caused by commodity circumstances (Reinartz & Ulaga, 2008).

Service innovation also means generating new or improved services in multiple aspects of the organization that better meet the needs and desires of customers. It can also be referred to as creating new and/or improved service offerings, service processes, and service business models (Ostrom et al., 2010).

Another type of service innovation is customer experience innovation, which involves creating new and engaging ways for customers to interact with a business (Ciuchita et al., 2019)

On the other hand, Yen et al. (2012) have presented two main pillars of Service Innovation," which address the strategic orientation for service innovation (SOSI) and the enabling mechanisms for service innovation (EMSI), around which the dimensions of service innovation readiness are centered. They identified six sub-dimensions stemming from the aforementioned pillars to achieve service innovation readiness, which will be the focus of this research in measuring service innovation readiness. These dimensions are:

1. Strategic investment: This means allocating appropriate and sufficient resources to achieve service innovation (Boulding & staelin, 1995; Li & Atuahene-Gima, 2001) and employing them in line with the company's business strategy to compete (Menor & Roth, 2008).

2. Risk tolerance: It refers to the extent to which a company is willing to bear actual or potential losses on its investments during the implementation of service innovation, i.e., the company's willingness to launch a new product without hesitation, even if it reduces sales of its current products. In other words, even if it has to abandon its old products and related investments, even if its profits are high, or what is called (willingness to "cannibalize") (Chandy & Tellis, 1998).

3. Service innovation champions (SI Champions): It refers to individuals who seek out creative ideas within the organization and bring them to fruition by building alliances, sharing knowledge, persuading others, and providing the energy and momentum for implementation by supporting and encouraging innovation (Beath, 1991) (Chakrabarti, 1989) (Markham & Green, 1991). While an innovation champion can be any employee within the organization, senior management is a prominent champion for innovation implementation (Eisenbach et al., 1999). Executive management also plays a crucial role in stimulating idea generation and developing potential proposals toward approval.

4. Inter-organizational collaboration: It means the degree to which an organization collaborates with its partners, such as suppliers and customers, in exchanging information, responding to market change, and planning business development in a way that enhances the organization's performance and thus expands and/or renews its existing resources, and improves its ability to innovate its services (Froehle & Roth, 2007) (Ritter & Gemünden, 2004) (Hunt & Morgan, 1996).

5. Service innovation experience: This refers to the knowledge gained from past experiences that facilitates the acquisition and retention of new knowledge (Cohen, & Daniel, 1990). Prior service innovation experience (SI) should foster organizational learning, which enhances the company's ability to evaluate and utilize newly acquired information in achieving the company's readiness for service innovation.

6. Information technology experience (IT experience): The use of technology and mastery of its skills enhances innovation in the services sector, increases productivity, and promotes economic growth across all sectors (Kashmolah &

Hamoody, 2024) (Alnesh & Jarallah, 2024) (Alkhaffaf, 2024). IT expertise can generate a sustainable advantage by integrating the organization's resources to enhance the organization's learning of information SI and coordinate SI activities across companies and between information activities and processes. IT support facilitates collaborative value creation with partners within the organization and across the entire value creation network (Lusch & Stephen, 2007).

3-3- Competitive Performance and Its Dimensions

The concept of competitive performance is not limited to the profits or activity volume achieved by organizations, but extends to the organization's ability to achieve distinction or relative superiority compared to competitors through excellence in financial performance, market share, organizational reputation, and innovative capabilities (Venkatraman & Ramanujam, 1986).

In the field of education, competition encompasses reputation, financial resources, research funding, talented students, university rankings, and partnerships (Bloch et al., 2024).

The competitive performance criterion depends on several dimensions that represent the most important areas of relative superiority; the most important of these dimensions are:

1- Financial and Resource Growth: A company's ability to optimize its financial and material resources is a key competitive criterion. Resource growth and financial sustainability reflect an organization's capacity to enhance its growth, support innovation, and improve quality. This can be measured by indicators such as improved financial sustainability, diversification of funding sources, the ability to finance new projects, and, in the case of colleges, securing grants or research and other service funding (Bloch et al., 2024) (Teece et al., 1997).

2- Expansion and Institutional Growth: Expanding programs, specializations, and services, such as opening new units or centers and building partnerships, is a fundamental criterion for institutional growth and expansion. In the field of education, expansion is not limited to increasing size but also includes training, new educational programs, consulting, and continuing education, thereby increasing service to different segments of society and enhancing competitiveness, student recruitment, and resource acquisition (Bloch et al., 2024) (Vargo & Lusch, 2004).

3- Market Position and Demand: The concept of Market Position and Demand varies depending on the type of activity an organization engages in. In colleges, it is reflected in the number of applicants, the ability to attract and retain outstanding students, making it their first choice, and the demand for its services such as training, consulting, and laboratories (Szymanski et al., 1993). The student journey from admission to graduation impacts satisfaction and reputation, thus reflecting the college's image. In the increasingly competitive educational environment, a positive student experience and the quality of support services are distinguishing factors no less important than course instruction (Porter, 1996).

4- Competitive Advantage and Reputation: Reputation directly influences student and partner decisions and access to funding. Trust is a key intangible asset

for organizations, playing a prominent role in enhancing competitive advantage and falling under the category of intangible resources in strategic planning, alongside knowledge (Hall, 2009). Organizations can achieve a competitive advantage by integrating their resources and capabilities (Al-Sukaini et al., 2024). A college's reputation can be demonstrated through several aspects, including its ability to attract distinguished faculty, its image among stakeholders, its capacity to provide outstanding community development services and programs, and its ability to increase the satisfaction of beneficiaries and stakeholders (Purevsuren et al., 2025).

5- Research and Innovation Competitiveness: One of the most important pillars of competitive performance in universities is the strength of research output and the ability to secure competitive research funding and translate research ideas into practical applications (Bloch et al., 2024).

4- Practical Part

4-1- Initial Perception of the Study Dimensions

Based on the responses of the participants in the studied sample, the focus is on the items with different dimensions along the axes of the current study, which were specifically included in the questionnaire designed for this purpose. To ensure accurate analysis, the researcher calculated the percentages of the respondents' answers, the arithmetic mean, and the standard deviation. The researcher used six dimensions to measure service innovation readiness: Strategic Investment, Risk Tolerance, Service Innovation Champions, Inter-organizational Collaboration, Service Innovation Experience, and Information Technology Experience. Each dimension was assessed using five questions, with a five-point Likert scale, to determine the respondents' level of awareness regarding service innovation readiness. Competitive performance was measured using five dimensions: Financial and Resource Growth, Expansion and Institutional Growth, Market Position and Demand, Competitive Advantage and Reputation, and Research and Innovation Competitiveness. Each dimension also had five questions. Table 2 describes the study dimensions as perceived by the respondents, including the percentages of responses, frequency distributions, means, and standard deviations for the study sample.

Table 2: percentages of responses, frequency distributions, means, and standard deviations for the study sample**.**

Main dimensions	Sub-dimensions	Mean	Standard Deviation	Agreement Ratio	Disagreement Ratio	Neutrality Ratio
Service Innovation Readiness	Strategic investment	3.5	0.83	61.6	14.1	24.3
	Risk tolerance	3.3	0.82	48.1	22.2	29.7
	Service Innovation Champions	3.6	0.82	61	12.4	26.5
	Inter-organizational collaboration	3.5	0.78	59	15.1	25.9
	Service Innovation experience	3.5	0.79	57.8	17.3	24.9
	Information Technology experience	3.5	0.78	58.9	16.8	24.3

Main dimensions	Sub-dimensions	Mean	Standard Deviation	Agreement Ratio	Disagreement Ratio	Neutrality Ratio
Total Average		3.53	0.74	57.75	16.31	25.95
Competitive Performance	Financial and Resource Growth	3.2	0.63	42.2	17.8	40
	Expansion and Institutional Growth	3.5	0.65	57.3	11.9	30.8
	Market Position and Demand	3.4	0.69	51.9	13	35.1
	Competitive Advantage and Reputation	3.4	0.80	51.4	13.5	35.1
	Research and Innovation Competitiveness	3.4	0.88	49.2	17.3	33.5
Total Average		3.44	0.65	50.38	14.70	34.92

Source: author's own compilation

The data in Table 2 above shows agreement among respondents regarding the dimensions of service innovation readiness (X1-X30). The overall agreement rate was (57.75), while the overall disagreement rate was (16.31), and the neutral response rate was (25.95). This indicates that respondents' responses to this variable were positive. This is further supported by the mean value, which exceeded the neutral value (3) for all dimensions, with an overall mean value of 3.53 and an overall standard deviation of 0.74. However, a closer examination of the results reveals varying degrees of variability in responses, as evidenced by the standard deviation values. Some responses showed moderate standard deviations, while others showed higher standard deviations, indicating differing perceptions among respondents regarding these dimensions. The interpretation is further strengthened by presenting the percentages of agreement, disagreement, and neutrality for each dimension, along with the standard deviation and mean results, to measure the strength of the trend and the degree of agreement.
Regarding the competitive performance dimension (X31-X55), the agreement rate was 50.38%, the disagreement rate was 14.7%, and the neutrality rate was 34.92%. This indicates that the respondents' answers to this variable were positive, a fact reinforced by the mean value, which exceeded the neutral value (3) for all dimensions. The overall mean was 3.44, while the overall standard deviation was 0.65. Some responses to the competitive performance dimensions showed a moderate standard deviation, while others showed a higher standard deviation, indicating varying levels of understanding among respondents regarding these dimensions.

4-2- Testing and Analyzing Correlation Relationships between Study Dimensions

Testing the First Main Hypothesis and its Sub-Hypothesis: This main hypothesis states that there is a statistically significant correlation between the dimensions of service innovation readiness combined and competitive performance. The sub-hypothesis states that there is a statistically significant correlation between each dimension of service innovation readiness and competitive performance. Table 3 shows the correlation relationships related to testing this hypothesis.

Table 3: Results of the Correlation Relationships of Service Innovation Readiness Dimensions Combined and Competitive Performance

Correlations	Dimensions of Service Innovation Readiness	Competitive Performance
Service Innovation Readiness	Strategic investment	0.78
	Risk tolerance	0.78
	Service Innovation Champions	0.80
	Inter-organizational collaboration	0.82
	Service Innovation experience	0.82
	Information Technology Experience	0.85
Total		0.88
N= 37	(P < 0.001)	

Source: author's own compilation

According to the table above, Pearson correlation coefficients revealed strong and significant positive relationships between service innovation readiness and competitive performance, with an overall correlation coefficient of (r=0.88), indicating a strong relationship between the two variables. Based on these findings, the first main hypothesis can be accepted at the college level under study.

Regarding the relationship between each dimension of service innovation readiness and competitive performance, this is illustrated in Table 3 as follows:

4-2-1- The relationship between strategic investment and competitive performance: The results showed a statistically significant positive correlation of 0.78 at a significance level of P < 0.001. This relationship indicates that the more strategic investment increases, the higher its level of competitive performance, and vice versa.

4-2-2- The relationship between risk tolerance and competitive performance: The results showed a statistically significant positive correlation of 0.78 at a significance level of P < 0.001. This relationship indicates that the higher the college's risk tolerance, the higher its level of competitive performance, and vice versa.

4-2-3- The relationship between Service Innovation Champions and competitive performance: The results showed a statistically significant positive correlation of 0.80 at a significance level of P < 0.001. This relationship is explained by the fact that the more effectively Service Innovation Champions lead the college, the higher the level of competitive performance, and vice versa.

4-2-4- The relationship between Inter-organizational collaboration and competitive performance: The results showed a statistically significant positive correlation of 0.82 at a significance level of P < 0.001. This relationship is explained by the fact that the more capable the college is of inter-organizational collaboration, the higher its level of competitive performance, and vice versa.

4-2-5- The relationship between Service Innovation experience and competitive performance: The results showed a statistically significant positive correlation of 0.82 at a significance level of P < 0.001. This relationship is explained by the fact that the more Service Innovation experience a college possesses, the higher its level of competitive performance, and vice versa.

4-2-6- The relationship between (Information Technology experience) and competitive performance: The results showed a significant positive correlation of 0.85 at a significance level of P < 0.001. This relationship is explained by the fact that the more the college possesses Information Technology experience, the higher the level of competitive performance, and vice versa.

Based on above findings, the second sub-hypothesis can be accepted at the college level under study.

4-3- Testing Effect Relationships of Study Dimensions

Testing the Second Main Hypothesis and its Sub-Hypothesis: The main hypothesis states that there is a statistically significant effect of the combined service innovation readiness on competitive performance. The sub-hypothesis states that there is a statistically significant effect of each dimension of service innovation readiness on competitive performance. Table (4) shows the influence relationships related to testing the two hypotheses mentioned.

Table 4: The Effect Results of Service Innovation Readiness Dimensions on Competitive Performance

Service Innovation Readiness Effect on Competitive Performance on overall level				
Dimension	**B (coefficient)**	**SE**	**t**	**R^2**
Service innovation readiness	0.7686	0.0697	11.03	0.7764
Effects of Service Innovation Readiness Dimensions on Competitive Performance for each dimension				
IT Experience	0.702	0.073	9.60	0.725
Inter-organizational Collaboration	0.678	0.079	8.53	0.675
Service Innovation Experience	0.669	0.079	8.48	0.673
Service Innovation Champions	0.633	0.079	7.99	0.646
Strategic Investment	0.611	0.081	7.51	0.617
Risk Tolerance	0.615	0.083	7.43	0.612
P < .001***	N= 37			

Source: author's own compilation

Based on the table above, we observe that the overall regression result has a positive and significant effect of service innovation readiness on competitive performance (B = 0.769, p < 0.001). This means that a one-point increase in service innovation readiness leads to a 0.77-point increase in competitive performance. The R^2 value of 0.776 indicates that service innovation readiness can explain 77.6% of the competitive performance in the college under study. According to mentioned results, the second main hypothesis is accepted**.**

To clarify the relationship at the sub-level, the analysis results in Table 4 show a statistically significant effect of each dimension of service innovation readiness on

competitive performance. However, the strongest explanatory dimension is IT Experience, followed by Inter-organizational Collaboration, and then Service Innovation Experience. This indicates that competitive performance in the university's operations and logistics environment is enhanced to a greater extent when service innovation readiness is expressed as actual operational capabilities based on institutional integration driven by digitalization and cumulative learning from past innovation experiences**.** In light of these findings, the second sub-hypothesis is accepted.

4-4- Supporting Evidence

To strengthen and enhance the survey results, secondary data were obtained from the Finance Division and the Studies, Planning, and Statistics Division at the College of Oil and Gas Engineering Techniques-Kirkuk. This data represents objective evidence of competitive performance and is based on two indicators related to two key dimensions of competitive performance: 1**- Financial and Resource Growth** 2**- Market Position and Demand** and **3- Expansion & Institutional Growth**. These indicators are used to support the perceived results with realistic indicators as illustrated in table (5) and table (6).

4-4-1- Data Supporting Financial and Resource Growth

The table (5) below shows secondary data supporting competitive Performance (Revenue of Evening study 2023-2025), indicating a clear and rapid growth in total revenues, as it increased from (73.000.000) IQD in 2023 to (379.700.000) IQD in 2025. This indicates a remarkable development in the financial performance of the college under study, thus enhancing its competitive position. These indicators support the results of the survey, which showed positive levels for the items of financial performance, thus enabling institutional growth and supporting new projects or activities.

Improving financial performance stems from higher student demand for the college's services, a result of improvements in its educational programs and logistical services.

Table 5: the final revenue statement for the evening study for the years (2023, 2024, and 2025) of Oil and Gas Techniques Engineering College / Kirkuk

Year	Total Revenue (IQD)
2023	73.000.000
2024	179.400.000
2025	379.700.000

Source: Author’s own based on collected data

4-4-2- Data Supporting Market Position & Demand, and Expansion & Institutional Growth

Data on student enrollment for the academic years 2023–2024, 2024–2025, and 2025–2026 have shown significant growth in the total student numbers, increasing from 108 students in 2023–2024 to 645 in 2025–2026. There was also a notable increase in morning enrollment from 53 in 2023–2024 to 486 in 2025–2026, and in evening enrollment from 55 in 2023–2024 to 159 in 2025–2026.

The results support two key dimensions: Market Position and Demand, and Expansion & Institutional Growth. These results reflect an increase in attractiveness and a higher number of applicants to the college's programs, as well as its growing capacity. This demonstrates the college's logistical capabilities and efficient operational organization, which in turn enhances its readiness to provide services effectively and strengthens its competitive position compared to previous years.

Table 6: shows the number of students registered at Oil and Gas Techniques Engineering College -Kirkuk for the academic years (2023-2024, 2024-2025, and 2025-2026).

Academic years	Number of students for morning study	Number of students for evening study	Total
2023-2024	53	55	108
2024-2025	172	62	234
2025-2026	486	159	645

Source: Author's own based on collected data

5- Conclusions and Recommendations

Based on the study's findings, the following conclusions can be made:

1- The results showed a higher-than-neutral perception of both service innovation readiness and competitive performance, indicating that the college possesses a positive readiness profile and a high competitive position within the institution.

2- The results demonstrated strong, statistically significant positive correlations between the study's dimensions. The findings also indicated a strong positive effect of service innovation readiness on competitive performance by simple regression analysis, supporting the idea that competitive performance can be enhanced through the dimensions of service innovation readiness.

3- Based on simple regression analyses at the sub-dimension level of readiness, all dimensions of service innovation readiness contribute positively and significantly to explaining competitive performance when each dimension was examined separately in relation to competitive performance.

The results also showed that IT Experience was the most significant factor influencing competitive performance, followed by Inter-organizational Collaboration and then Service Innovation Experience. These results suggest that service innovation readiness in operations and logistics at educational institutions is significantly enhanced when translated into actual operational capabilities through digital empowerment of coordination between units and partners, and the accumulation of practical experience in achieving readiness, rather than relying solely on strategic investment or leadership support.

Meanwhile, secondary data provided positive support for the survey results, particularly regarding Financial and Resource Growth, Market Position and Demand, and Expansion & Institutional Growth.

In light of the research findings, several recommendations can be included, as follows:

1. Adopting a unified digital platform for educational services, consolidating registration, scheduling, exams, applications, complaints, and documents into a single system.
2. Sharing information between units, divisions, and departments.
3. Creating a unified registry of innovative initiatives, identifying innovative individuals, and allocating appropriate budgets to them to translate leadership support into tangible implementation.

Regarding the research scope, it is suggested to expand the study sample to include at least five colleges within the university and to integrate more objective supporting data with the questionnaire.

In conclusion, enhancing competitive performance requires translating readiness into operational practices, coupled with sustained leadership support, strategic investment, and a capacity for change. The study's findings help decision-makers in higher education institutions in prioritizing the development of educational services through operations and logistics, thereby enhancing competitive performance.

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