



Research Article

The Impact of Information Communication Technology and Intellectual Capital on Public Sector Performance: The Mediating Roles of Innovation and Corporate Entrepreneurship.

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Abstract

The public sector services are essential for fulfilling the basic needs of the citizens. However, evidence of poor public service delivery continues to raise concerns. The main aim of this research is to recommend enhancements for public service performance. This research is quantitative in nature, with a sample of 250 employees who use Information and Communication Technology selected for the study with their responses analyzed through the Structural Equation Modeling method (SEM). The key findings are, intellectual capital significantly influences organizational performance; ICT Use significantly influences innovation and corporate entrepreneurship; and innovation significantly influences corporate entrepreneurship. It is mentioned to incorporate ICT use and intellectual capital in future frameworks related to public sector performance under theoretical implications. The practical implications are the development of intellectual capital in public organizations and integration of ICT in office environment to promote ICT use. The policy implications highlight the necessity for authorities to formulate policies to develop intellectual capital and encourage ICT use in public sector settings.

Introduction

The citizens are disappointed about the time and effort applied on obtaining their essential services such as National Identity Cards, Passports and Driving Licenses through public sector institutions in Sri Lanka (Fernando et al., 2024). These services are very crucial for human lives and very important to discover the individuality of the people during various day today transactions. Hence this study focuses on performance of public sector institutions which essential services are delivered.

The public sector plays a vital role in the development of the country. One of the definitions highlights public service as a “composite of activities needed by the general public but cannot be availed in the open market unless through resource allocation provided by the government” (Jackson,2020). Most of the decisions made by the government are implemented through public sector institutions which involve ministries and

departments. A few services handled by the public sector are education, health care, forces in Sri Lanka (Santos, 2023). These public services are supportive of the development of the nation and encourage welfare and justice in society. Quality is one of the most important considerations in public sector services and it decides the satisfaction of the people and trust in the government (Pareek & Sole,2022). However, it has been highlighted that developing countries face difficulties of provide an effective public service for the citizens including Sri Lanka (Fernando et al., 2024). The people who are waiting to obtain their National identity Card (NIC) should go through a painful process (DRP, 2016). The process involves filling in several documents, getting the approval from the authorities and visiting the departments to hand over documents. This may waste money, time and effort of the citizens while making them unhappy. According to one of the references, Sri Lanka public

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sector efficiency rate is indicated as 25% (Malinga, 2025). The public sector impairment occurred due to various reasons such as the availability of improper systems, lack of skills and many strikes. The high-performance service delivery system helps people to maintain quality life while increasing livelihoods of citizens (Masuku & Jili, 2019). Therefore, the people will not be fed up and may think of staying in the country avoiding migrations. The future investments coming to the country will be increased as most of the approval services should be received from public institutions.

This study aims to examine the impact of public service performance with the support of ICT use, intellectual capital, corporate entrepreneurship and innovation. ICT use and intellectual capital are used as independent variables while corporate entrepreneurship and innovation are playing the role of mediation. Organizational performance acts as the dependent variable in the study.

Information and Communication Technology (ICT) can be considered as an influencer to improving public service delivery. ICT refers to the technology on retrieval, storage, manipulation and transmission of digital data (Kamar et al., 2022). ICT is applied in many business operations in the world for making them effective. Booking taxis, reserving hotel rooms, interacting with banks and purchasing products are some of the famous examples of where ICT is being used by people today. The lives of the citizens are more comfortable due to the application of ICT for daily operations. One of the cases in Bangladesh highlighted that use of ICT makes public service delivery is accountable, transparent and effective (Karim & Hosen, 2023). This further reveals that ICT is an important factor for making public service delivery effective for the citizens. In addition to that one of the studies was conducted in Sri Lanka to receive the contribution of Information and Communication Technology (ICT) on improving of public service delivery (Alahakoon & Jehan, 2020).

In addition to ICT use, contribution made by variables innovation, corporate entrepreneurship and intellectual capital towards public sector performance is evaluated. Innovation can be defined as “company’s predisposition to enable creativity and experimentation and to introduce new products/services by seeking technological leadership in novel processes” (Garrido-Moreno et al., 2024). This definition reveals that new products and services are introduced because of innovation. These new products and services may add value to the organization, and it may cause to increase organization performance. According to the definition presented by Urbano et al. (2022), corporate entrepreneurship is “initiatives that take place within companies and that aim at creating and adding new business, or at fostering innovation, change and renewal” (Urbano et al., 2022). The definition points out that corporate entrepreneurship encourages innovation in the organization. Hence corporate entrepreneurship contributes to influencing organization performance. Intellectual capital can be introduced as intangible assets and knowledge-based resources which is essential for an organization to face competition through value creation (Weerasinghe & Thilakasiri, 2024). It can be stated that Intellectual capital may increase the performance of the organization due to value creation.

This study sets five objectives, and those are listed as below.

- To identify the relationship between ICT use and innovation on the one hand and organization performance on the other hand.

- To identify the relationship between corporate entrepreneurship and organization performance.
- To discover the role of mediation played by innovation in the relationship between ICT use and organization performance.
- To discover the mediation role played by corporate entrepreneurship in the relationship between ICT use and innovation with organization performance.
- To determine intellectual capital necessary for organizational performance.

This research study is different compared to past studies carried out due to various factors such as not limiting the study on specific public sector institutions, combination of multiple variables for influencing public sector performance, measurement of intellectual capital variable with quantitative approach and use of quantitative approach for testing public sector performance.

According to the findings of the research, the government can act on increasing ICT use in the public sector. In addition to that some precautions can be taken to develop a more effective management plan for making changes in the public sector services to use ICT. In addition to that this study concerns innovation and corporate entrepreneurship. Therefore, government should have some initiatives for promoting innovation and encourage entrepreneurial activities. Meanwhile, this study concerns intellectual capital which can be used to bring higher performance for the organization.

The next section of the research study focuses on reviewing the literature related to previous research studies published. The third section is methodology, and it explains methods used in the study. The fourth section is data analysis, and it highlights the way of analyzing collected data. The final section is the conclusion, and it is mainly focused on discussing achievement of objectives, implications and limitations of the current study.

Literature Review

This section presents the theory used for the current study, contributions made by researchers and the research gap addressed.

Resource-Based View Theory

It is vital to decide an appropriate theory for the research study to lay a strong foundation and derive the findings necessary to solve the problem. It is selected resource-based view (RBT) theory for the current research study. This theory is found by Birger Wernerfelt in the early 1990s and it highlights that the competitive advantage of the firm is based on resources that exist in the firm (Vasudevan, 2021). This theory is well suited to the current study as theory speaks on competitive advantage which can be referred in terms of service performance in the public sector settings.

The theory, Resource-based view concerns only resources which competitive advantage can be gained. ICT technologies such as Enterprise Resource Planning (ERP), Information Management Systems (IMS), Cloud Computing, Artificial Intelligence (AI) are considered as enabling technologies (ET) as they are less widely used and advanced. These enabling technologies can be introduced as strategic resources due to the attributes such as valuable, rare, inimitable, and non-substitutable (Karim et al., 2022).

Organization Performance (Service)

There are various definitions provided by authors for service performance which are considered as the focus in this research study. Authors Cronin & Taylor (1994) stated that “Service Performance (service performance) is the performance of the service received by consumers themselves and assess the quality of service who felt” (Sutjahjanti et al.,2021). The definition provided by Parasuraman, Zeithaml and Berry highlighted that “service performance is measured by the customer's feelings when receiving service quality” (Sutjahjanti et al.,2021). According to both definitions mentioned, service performance is a concern regarding what customers felt about service quality. It is difficult to measure the quality of a service compared to a product due to intangibility. The product has features and a specification for evaluating quality. Therefore, it is easy to evaluate the quality. The feelings of the customer through experience are important to evaluate the quality of the service. The service delivery organization should be careful to provide better experience for the customers to generate good feelings on services which people receive. This better experience may include higher speed, accurate output, less revisits, less touch points and less extra cost. If these attributes exist in the services, people's perception may be positive on the service and performance may be higher.

Information and Communication Technology (ICT) Use and Organizational Performance

There are various studies carried out on finding impact of ICT for public service delivery. It is found a recent study conducted in India aiming at public service delivery efficiency with the adoption of artificial intelligence (Kulal et al., 2024). However artificial intelligence is considered as one of the latest technologies coming under ICT. The findings of the study highlighted that artificial intelligence (AI) adoption has made significant improvements in citizen centric services and municipal processes. Therefore, it is important to use ICT for delivering services required by the people. It mainly includes ICT applications which facilitate to deliver services. But these ICT applications can be executed with the support of several tools and technologies.

Corporate Entrepreneurship and Organization Performance

According to the facts mentioned, it has been identified that corporate entrepreneurship plays an important contribution on bringing competitive advantages in organizations (Baena-Luna et al., 2024). Hence it should be considered corporate entrepreneurship as an essential component for receiving higher performance from the organizations. There are several definitions to introduce corporate entrepreneurship. It is picked one of the frequent definitions which is highlighted in few past studies (Girma Aragaw et al.,2024), (Stefano Angelo et al.,2024).According to the studies mentioned, Robert Burgelman defined corporate entrepreneurship as “the process whereby firms engage in diversification through internal development”. This definition highlighted that it is required to use new resources by the organization to complete operations withing the business domain. It further explains the requirement of having internal venture activities in the organizations using existing competencies. These activities may improve the current performance levels of the organizations.

Innovation for Organizational Performance and Corporate Entrepreneurship

Innovation is another key variable of the current research study which focuses on organizations' performance. Innovation has been identified as a most efficient strategy to gain competitive advantage through self-efficacy and self-turning business modeling in the competitive environment (Malodia et al., 2023). This factor confirms that performance of the organizations can be enhanced through integration of innovation for organization operations. It is important to study the concept of innovation referred to in past studies. There were many researchers searching for the concept of innovation and one of the researchers called Joseph Schumpeter presented his view on innovation (Silva & Di Serio, 2021). According to his definition innovation is “the introduction of something new or improved, by way of a process of creative destruction, and with an economic result”. The definition highlighted that innovation should add value to the company, market, industry or the world through bringing something new or better than existing. Therefore, it is no doubt that innovation helps to make enhancements on organization performance through new ways of delivering services. In addition to that it has been revealed the contribution made by innovation on entrepreneurship in organizations (Kreiterling,2023). Innovation contributes to growing Gross Domestic Product (GDP), enhancing business performance and increasing competitiveness (Kreiterling,2023). These enhancements may create an environment to perform entrepreneurship activities in the organization. Therefore, it can be stated that innovation plays an important role in promoting corporate entrepreneurship.

ICT and Innovation

It has been identified the role played by ICT for influencing innovation in organizations (Alam et al., 2022). According to Alam et al. (2022), Internal and external communication has been improved due to the involvement of ICT including broadband internet. The improvement of communication is very supportive to connect with necessary resources for discovering innovations. These resources may include databases, experts and documents. However, these innovations can contribute to better way of delivering services with higher performance.

ICT and Corporate Entrepreneurship

Not only innovation, but it is also revealed that ICT has a capability on influencing entrepreneurship in the organizations (Afawubo & Noglo, 2021). The existence of ICT highlights the importance of opportunities in an economy for receiving information and knowledge. In addition, information and communication technology infrastructure are very helpful to conduct entrepreneurship activities and business. Not only that but also the internet, smart phones and ICT devices facilitate people to engage in online businesses. The fact mentioned by Afawubo & Noglo (2021) highlighted that China exceeded 10 million in number of businesses which rely on online transaction platforms in 2015.It further emphasizes positive impact made by ICT use on corporate entrepreneurship. The organizations which provide rich ICT environment may promote entrepreneurship culture inside and it may be helpful to develop new ways of doing operations such as effective service delivery while enhancing performance.

Intellectual Capital and Organizational Performance

Intellectual capital is identified as a key player which impacts on organization performance. There are definitions that exist for introducing intellectual capital. According to Kaplan and Norton, intellectual capital is defined as “intangible assets of a firm, responsible for fostering the performance of an organization toward attaining high profits” (Mukaro et al., 2023). The definition given by Hamadamin and Atan stated that “Intellectual capital is the collection of abilities, knowledge, and skills essential to execute work that provides economic value for the organization” (Hamadamin & Atan, 2019). According to the points highlighted by the definitions, performance level of an organization can be enhanced through better management of intellectual capital such as knowledge, abilities and skills. When intellectual capital is further explored, it was able to identify the categories of intellectual capital (Falcó et al.,2022). Human capital, organization capital and relational capital are the three main ways of categorizing intellectual capital. Human capital is critical out of three categories, and it can be introduced as collective intellect of the professionals in the organizations engaging in cognitive activities (Spaho, 2024). The organization’s capital is residual knowledge and system which employees leave at the end of the working day (Beltramino et al.,2020). Finally, relational capital highlights the value received through the relationships maintained by the organization withing the scope (Szudrowicz, 2020). The relational capital covers connections maintained with stakeholders such as customers, suppliers, distributed channels and partners.

Literature Gap

This section focuses on identifying the gap addressed by the current study. Firstly, the current research work is addressed on essential services delivered by public sector institutions in Sri Lanka such as department of registration of persons, passport office, water board, divisional secretariat. Hence this study is not limited to a specific sector but open to all public sectors which deliver services. Secondly, this study integrates several variables into one framework to see the influence made on organization performance. These variables are ICT use, innovation, intellectual capital and corporate entrepreneurship. Thirdly, intellectual capital is measured though qualitative approach in most of the studied which cover Sri Lanka government organizations. But quantitative approach is used in the current study. Finally, empirical evidence remains limited due to the application of qualitative approach. But this research study relies on quantitative approach to test the affection of factors such as ICT use and intellectual capital on organization performance with real data collection from public institutions.

Conceptualization

This section focuses on presenting the developed conceptual model based on the evidence mentioned in literature review conducted in the previous section. Figure 1 visualizes the proposed conceptual framework of the current study. Hypothesis are listed from H1 to H10 aligned with the conceptual framework.

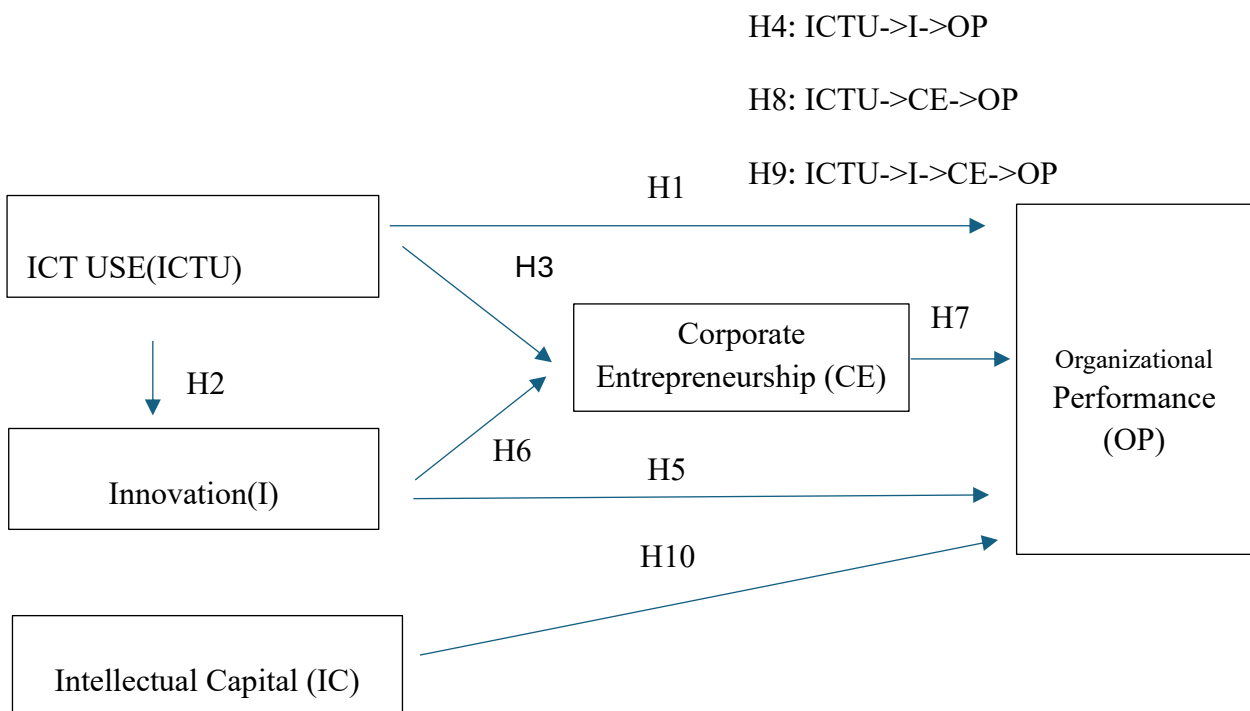


Figure 1 Conceptual framework

Source: Own Elaboration

H₁: There is a relationship between ICT use and organizational performance.

H₂: There is a relationship between ICT use and innovation.

H₃: There is a relationship between ICT use and corporate entrepreneurship.

H₄: Innovation mediates the relationship between ICT use and organizational performance.

H₅: There is a relationship between innovation and organizational performance.

H₆: There is a relationship between innovation and corporate entrepreneurship.

H₇: There is a relationship between corporate entrepreneurship and organizational performance.

H₈: The corporate entrepreneurship mediates the relationship between ICT Use and organizational performance.

H₉: Corporate entrepreneurship and innovation have a double mediation effect on the relationship between ICT Use and organizational performance.

H₁₀: There is a relationship between intellectual capital and organizational performance.

The conceptual framework presented all the variables, and the relationships created among variables. ICT USE refers to the use of a set of tools and resources to communicate and to create, spread, store and manage information. There are six items adapted from past studies to represent the variable, ICT Use (Yunis et al., 2017), (Davis et al., 1989), (Rogers, 1995), (Agarwal and Prasad, 1998). The construct, Innovation represents the process used to increase organization value through novelty. The number of six items are adapted from previous studies to measure innovation (Yunis et al., 2017), (Gatignon, 2002). Corporate Entrepreneurship is used to refer attitudes and actions that are required to seize opportunities, take risks and innovation. Four items are adapted from previous studies that measure Corporate Entrepreneurship (Yunis et al., 2017), (Zahra, 1996). The variable, Intellectual Capital expresses a collection of knowledge, experience, and practical talents that organizations can use to generate value covering human capital, structural capital, and relational capital. It is adapted 12 items to measure Intellectual Capital (Ahmed et al., 2019), (Kusi-Sarpong et al., 2021), (Thanh et al., 2023), (Huynh et al., 2024). Finally construct, Organization Performance is set to refer sales growth, market share, profitability and overall performance. It consists of 6 items adapted which are adapted from the previous studies to measure it (Yunis et al., 2017), (McDougall et al., 1994).

Methodology

This study is grounded in positivism. Therefore, it was proposed that a conceptual framework comprising of variables and the relationships identified through the literature review are aligned with research objectives. The hypotheses were built based on the conceptual framework presented. A quantitative research design was used in this study, and the research questions were developed to receive statistical answers.

The population of the study consisted of employees who deliver essential services in public sector institutions using information and communication technology in the context of entrepreneurship and innovation. There are some public sector institutions which information and communication are applied for essential service delivery. The Department of Immigration and Emigration, Department for Registration of Persons, Department of Motor Traffic and Divisional Secretariats are some of the institutions among ICT based public organizations in Sri Lanka. Convenience sampling was employed due to the absence of a clearly defined sampling frame. The sample size

was decided as 250 for deriving better findings through data analysis.

The questionnaire was adapted from past studies, and it consisted of questions for measuring variables such as Use of ICT, Innovation, Corporate Entrepreneurship, Employee Performance and Organization Performance (Yunis et al., 2017). The 5-point Likert scale was used to collect the responses for the items in the questionnaire.

The drafted questionnaire was pre-tested with 15 selected public sector employees and enhanced further based on the responses received from the pre-test before real data collection. The respondents were given proper instructions about the survey and enough time to complete it without disturbing the routine office work.

The data analysis was performed using the software tool Smart PLS 4. The Structure Equation Model (SEM) was conducted to test relationships mentioned in this research study.

Data Analysis

This study employed SMARTPLS 4 as a tool for the data analysis process and it supports data analysis regardless of data normality and sample size (Chatterjee et al., 2023).

Demographics and Descriptive Statistics

According to the demographic statistics presented in Table 1, majority of the employees are females, and it is 55.6%. The male employees are the minority in public sector services, and it represents 44.4% of the total employees. It can be stated that female employees are 10% higher than male employees in the public sector and female employees are more interested to join for public sector.

When it considers age of the employees, majority of the employees are in the range between 31 - 40 years old (38.8%) while the minority of them is between 21 - 30 years old (11.2%). In addition to that 32.0% of employees are between 41 - 50 years old and 18.0% of the total are between 51 - 60 years old. According to these figures most of them are mature energetic employees and they can be directed to receive higher performance in the public sector.

In academic qualifications, most of the employees completed diplomas and it is 30.0%. The lowest of the employees completed the PhD and it is calculated as 8%. In addition to that, employees completed Bachelor, Certificate, Masters and AL. The percentages are 28.8%, 9.2%, 16.8% and 7.2%. According to these data, public sector lacks highly qualified employees. Most of the working force do not obtain a degree. This can be a challenge for the public sector to increase their current performance.

When it considers experience, The highest number of employees have experience of 11- 15 years (34%) while the lowest are having below 5 years (12%) of experience. In addition to that there are employees who have 16 - 20 years of experience, 5 - 10 years of experience and over 20 years of experience. The experience between 16 - 20 years represents 15.2% and experience between 5 - 10 years represents 13.2%. The employees who have over 20 years of experience represent 25.6% of the total. These statistics indicate that majority of the public sector employees have more than five years of experience and it is a plus point for enhancing performance of the institutions.

Table 1: Descriptive Statistics of Study Variables

Variable	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Std. Error	Kurtosis	Std. Error
ICTU	250	1.00	5.00	3.5833	.74134	-.508	.154	.758	.307
INN	250	1.33	5.00	3.4520	.75037	-.345	.154	.104	.307
CE	250	1.00	5.00	3.3150	.80693	.016	.154	.062	.307
IC	250	1.75	5.00	3.5683	.67127	-.225	.154	.068	.307
OP	250	1.67	5.00	3.6220	.67408	-.197	.154	-.307	.307
Valid N	250								

Source: Survey Data

Note: ICTU = ICT Use, INN = Innovation, CE = Creative Engagement, IC = Intellectual Capital, OP = Organizational Performance.

Measurement Model

Reliability calculation is essential under data analysis as it indicates how the items in the questionnaire provide stable results in repeated scenarios. Reliability, which is measured by coefficient alpha between 0.70 to below 0.80 are considered as having a good reliability (Edelsbrunner et al., 2025). Table 2 presents the Cronbach's Alpha values generated for each

variable and it states that reliability of the variables is very good. In addition to Cronbach's Alpha, composite reliability (CR) is used to assess internal reliability of structural equation modeling (SEM). The CR value should be greater than 0.7 to define it as good reliability (Cheung et al., 2023). The CR value for each variable mentioned in table 2 is greater than 0.7 and proves that internal consistency is supportive.

Table 2: Reliability and Validity of Constructs

Variable	Cronbach's Alpha	Composite Reliability (rho_a)	Composite Reliability (rho_c)	Average Variance Extracted (AVE)
Corporate Entrepreneurship (CE)	0.876	0.888	0.915	0.730
Intellectual Capital (IC)	0.932	0.935	0.942	0.574
ICT Use (ICTU)	0.836	0.844	0.879	0.549
Innovation (INN)	0.925	0.933	0.941	0.728
Organizational Performance (OP)	0.876	0.878	0.910	0.668

Source: Survey Data

The validity focuses on evaluating the instrument of the study and it evaluates the appropriateness of the instrument for measuring what it aims to measure. Fornell and Larker criterion is used to measure the discriminant validity of the constructs in the current research (Panzeri et al., 2024). Similarly Average Variance Extracted (AVE) is calculated to receive convergent validity for the constructs. According to table 3, AVE values for all constructs are greater than 0.5 value and it states that

convergent validity is established (Cheung et al., 2023). When assessing Fornell and Larker criterion, square root of AVE (diagonal values) should be higher than off diagonal values to confirm discriminant validity (Lim, 2024). According to table 3, all the constructs confirm discriminant validity.

Table 3: Correlation Matrix of Variables

Variable	CE	IC	ICTU	INN	OP
CE	0.855				
IC	0.584	0.758			
ICTU	0.468	0.514	0.741		
INN	0.499	0.637	0.618	0.853	
OP	0.453	0.754	0.419	0.449	0.818

Source: Survey Data

The variance Inflation Factor (VIF) is used to highlight the multicollinearity among variables referred to in the current study. The VIF values should be 5 or below according to the recommendations (Subhaktiyasa, 2024). Table 4 has listed VIF

values of the constructs which are used in the current research study. According to the figures, it can be stated that multicollinearity level is acceptable as it presents less than 3 value.

Table 4: Variance inflation factors of constructs

Constructs	VIF
CE -> OP	1.631
IC -> OP	2.029
ICTU -> CE	1.619
ICTU -> INN	1.000
ICTU -> OP	1.737
INN -> CE	1.619
INN -> OP	2.114

Source: Survey Data

The model presented by figure 2 is evaluated to derive the relationships between variables of the proposed model. The hypothesized paths of Intellectual Capital towards Organization Performance, ICT Use towards Innovation, ICT Use towards Corporate Entrepreneurship and Innovation towards Corporate Entrepreneurship are evaluated. According to the evaluation, it is found that Intellectual Capital ($p < 0.01$, $t > 1.96$) significantly influences Organization Performance while ICT Use ($p < 0.01$, $t > 1.96$) significantly influences innovation and Corporate Entrepreneurship. Furthermore, it indicates that Innovation ($p < 0.01$, $t > 1.96$) significantly influences Corporate Entrepreneurship (Yendra et al., 2024).

Table 5 presents the statistics generated during SMARTPLS execution.

The evaluation is further extended to investigate mediation effect between variables in the defined model. According to the model, Innovation mediates ICT Use and Organization Performance, Corporate Entrepreneurship mediates ICT Use and Organization Performance. Furthermore, Corporate Entrepreneurship and Innovation have a double mediation effect on the relationship between ICT Use and Organizational Performance. But evaluation was unable to discover mediation effects due to higher P-values generated. Table 6 indicates the statistics generated during SMARTPLS execution.

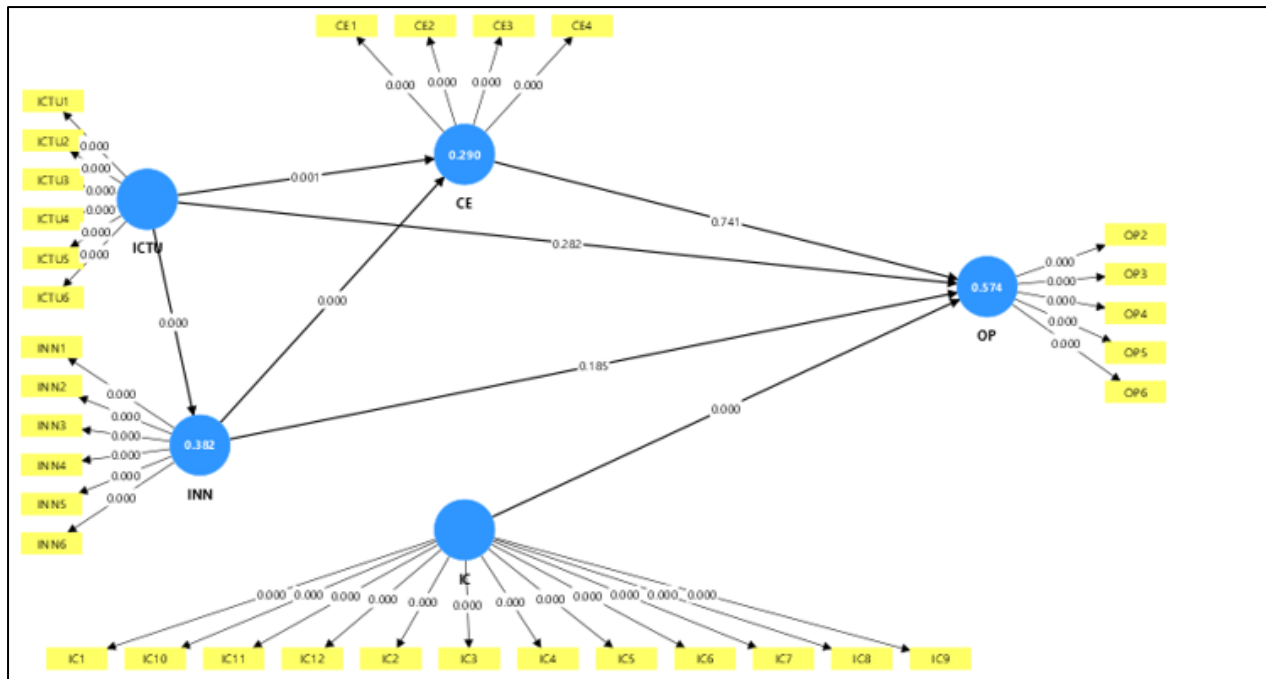


Figure 2 Inner model
Source: Own Elaboration

Table 5: Path Coefficients and Significance Levels

Hypothesis	Path	Original Sample (O)	Sample Mean (M)	Std. Deviation (STDEV)	T Statistics	P Values	Result
H7	Corporate Entrepreneurship → Organization Performance	0.020	0.019	0.060	0.331	0.741	Not Supported
H10	Intellectual Capital → Organization Performance	0.765	0.766	0.059	12.991	0.000	Supported
H3	ICT Use → Corporate Entrepreneurship	0.258	0.257	0.078	3.317	0.001	Supported
H2	ICT Use → Innovation	0.618	0.621	0.048	12.947	0.000	Supported
H1	ICT Use → Organization Performance	0.075	0.076	0.070	1.077	0.282	Not Supported
H6	Innovation → Corporate Entrepreneurship	0.340	0.342	0.087	3.919	0.000	Supported
H5	Innovation → Organization Performance	-0.096	-0.094	0.073	1.326	0.185	Not Supported

Source: Own Elaboration

Table 6: Mediating effects on the structural model

Hypothesis	Path	Original Sample (O)	Sample Mean (M)	Std. Deviation (STDEV)	T Statistics	P Values	Result
H4	ICT Use→ Innovation→ Organization Performance	-0.060	-0.058	0.045	1.313	0.189	Not Supported
H8	ICT Use→ Corporate Entrepreneurship→ Organization Performance	0.005	0.005	0.016	0.310	0.757	Not Supported
H9	ICT Use→ Innovation→ Corporate Entrepreneurship→ Organization Performance	0.004	0.003	0.013	0.316	0.752	Not Supported

Source: Own Elaboration

Discussion

The research study was designed to find the impact of ICT use and intellectual capital for the public sector essential service performance. This research is very important for everyone as the lives of the citizens are affected by the public services. Resource-based view (RBT) theory is applied as the foundation for this research. This research study presented ten hypotheses based on the conceptual framework to measure the direct effect and mediation effect. The evaluation of each hypothesis is discussed below.

ICT use influences organization performance (H1)

The relationship between ICT use and organizational performance is not discovered in the current study. It interprets that use of ICT does not provide appropriate influence for enhancing organization performance in public institutions. The reasons behind this non-influence can be generated because of employees’ attitudes on ICT use, poor ICT skills of the employees and non-alignment ICT with organization strategy. However, this finding is not aligned with one of the studies conducted in past because the study mentioned that ICT is supportive for organization performance (Kulal et al., 2024).

ICT use influences innovation (H2)

It is noted that ICT use and innovation is supported in the current study. This underlines that more innovations can be taken out through facilitation of ICT use for the employees in public sector. Because information and resources are more accessible through the availability of internet for employees to study and work for innovations. This outcome is further confirmed by the findings mentioned in one of the previous studies (Alam et al., 2022).

ICT use influences corporate entrepreneurship (H3)

The relationship between ICT use and corporate entrepreneurship is supported in the study. According to this, corporate entrepreneurship culture can be rooted in public institutions by setting appropriate ICT facilities for employees to use. This is possible as ICT allows people to access internet-based information, make online connections among people, and use tools for doing experiments. However, a past study also confirmed the statement expressed by H3 (Afawubo & Noglo, 2021).

Innovation does not mediate the relationship between ICT use and organizational performance (H4)

Unfortunately, this research study does not support mediation relationship played by innovation between ICT use and organization performance. It emphasizes that organization performance cannot be enhanced through innovation which is influenced by use of ICT in the public sector. But it is already found that ICT Use influences innovation in this study. However, mediation may not be supported due to poor innovations which fail to receive higher organization performance in the public sector. The research study conducted by Al-Omouh et al. (2020), specifies that innovation mediates the relationship between ICT use and organizational performance.

Innovation does not influence organizational performance (H5)

The current study is unable to find the relationship between innovation and organization performance. This indicates that public sector performance cannot be increased by boosting innovations. This may occur as current innovations done in the public sector are not adequate to fulfill the requirements necessary for organizational performance. Despite this finding,

one of the past studies revealed that innovations are supportive for increasing organization performance (Kreiterling,2023).

Innovation influences corporate entrepreneurship (H6)

It is clearly revealed that innovation is supportive for corporate entrepreneurship in public institutions. According to that, it is necessary to invest more in activities which are related to innovations in the public sector to receive higher returns from corporate entrepreneurship. This happens as innovation supports building creativity, taking risks, identifying opportunities and working on experiments which are necessary for corporate entrepreneurship. One of the studies conducted also highlighted the necessity of innovation for developing corporate entrepreneurship (Kreiterling,2023).

Corporate entrepreneurship does not influence organization performance (H7)

This research work does not find the relationship between corporate entrepreneurship and organization performance. This indicates that current corporate entrepreneurship works are not effective in public institutions to enhance organization performance. The reasons for this ineffectiveness may be due to less incentives given for corporate entrepreneurship, less focus on profit and bureaucratic constraints.–But one of the previous studies proved the existence of the relationship between corporate entrepreneurship and organization performance (Baena-Luna et al., 2024).

Corporate entrepreneurship does not mediate the relationship between ICT Use and organizational performance(H8)

It is revealed that corporate entrepreneurship does not play the mediation role on ICT use and organization performance. According to this outcome, it is unable to improve organization performance through corporate entrepreneurship which is influenced by use of ICT. But it is already discovered that use of ICT impacts on corporate entrepreneurship. Even though use of ICT is supportive of corporate entrepreneurship, outputs created by corporate entrepreneurship are not sufficient to enhance organization performance due to reasons such as less incentive set for corporate entrepreneurship, less focus on profit and bureaucratic constraints. One of the past studies highlighted mediation role played by corporate entrepreneurship between ICT and organizational performance (Rehman et al., 2020).

Corporate Entrepreneurship and Innovation do not have a double mediation effect on the relationship between ICT Use and Organizational Performance(H9)

This research is unable to find the mediation effect of corporate entrepreneurship and innovation between ICT use and organizational performance. It interprets that organizational performance cannot be increased through corporate entrepreneurship and innovation which are influenced by use of ICT. One of the reasons for this nature may be ineffective outcomes created by current corporate entrepreneurship activities to receive desired outcomes for innovation and less effective innovations which fail to achieve higher organizational performance. But this double mediation is supported in one of the past studies conducted (Yunis et al., 2018).

Intellectual capital influence organizational performance (H10)

It is shown that intellectual capital supports the performance of public sector organizations in this research study. It emphasizes that higher performance can be received through intellectual capital such as human capital, structural capital and relational capital. Examples of intellectual capital can be listed as knowledge, skills, processes, systems, customer trust and relationships with stock holders. One of the studies also highlighted the support receive from intellectual capital on improving organizational performance (Mukaro et al., 2023).

Conclusion

This section covers the findings, implications and limitations of the study.

Findings

This research presents key findings aligned with the research objectives whilst testing the hypothesis. The first key finding is that ICT use has an impact on innovation in public service settings while emphasizing innovation should be promoted through ICT initiatives. However, the results reveal that ICT and innovation do not directly enhance organizational performance. This is aligned with the first objective which is to identify the relationship between ICT use and innovation on the one hand and organization performance on the other hand. Secondly it is found that ICT use has a relationship with corporate entrepreneurship. This finding reveals that involvement of ICT is important to increase corporate entrepreneurship in public sector. But it is noted that corporate entrepreneurship does not show support on increasing organization performance. This expresses the achievement of second objective which is to identify the relationship between corporate entrepreneurship and organization performance. Thirdly it is found that innovation does not play a mediation role between ICT use and organization performance. Therefore, it satisfied the third objective which is to discover the role of mediation played by innovation in the relationship between ICT use and organization performance.

Fourth, this study confirms a relationship between innovation and corporate entrepreneurship, and it encourages public organizations to promote innovation for receiving better outcomes from corporate entrepreneurship. In addition to that it is discovered that corporate entrepreneurship and innovation do not play a mediation role between ICT use and organizational performance. This highlights that testing of fourth objective which is to discover the mediation role played by corporate entrepreneurship in the relationship between ICT use and innovation with organization performance. Finally, the research found that there is a relationship between intellectual capital and organizational performance. Hence contribution of intellectual capital is a key for reaching higher performance in public institutions. Accordingly, the fifth objective is to determine intellectual capital necessary for organizational performance.

Implications

It is essential to focus on the implications of this research study as theoretical, practical and policy. Firstly, theoretical implications are discussed. The key findings are aligned with the foundation provided by Resource based view (RBV) theory directly and indirectly. This theory emphasizes that organizations receive competitive advantage through effective management of strategic resources. Intellectual capital provides valuable resources such as knowledge, skills, relationships to gain competitive advantages aligned with base

of the theory directly. In addition to that, ICT is considered a valuable resource which enables innovation and corporate entrepreneurship in public institutions. Therefore, the key findings, ICT use influences innovation and ICT use influences corporate entrepreneurship are aligned with resource-based view theory indirectly as ICT use supporting organizations to gain higher performance through innovation and corporate entrepreneurship. Therefore, it is required to integrate intellectual capital and ICT use in future frameworks in relation to public sector performance.

The discussion on practical implications is important for enhancing current performance levels in public institutions by the authorities. According to the findings, public sector management should give greater emphasis to intellectual capital and ICT use. Intellectual capital supports to boost organization performance and ICT use promotes innovation and corporate entrepreneurship in the institutions. The public sector management should take actions to develop knowledge, skills and relationships in the organizations. Designing and conducting necessary employee training programs is highly important periodically, along with establishing appropriate evaluation mechanisms to assess training effectiveness. In parallel management of public sector institutions should draft a plan to spread ICT usage in the organizations for incorporating innovative and corporate entrepreneurship culture. The plan should include a way of introducing strong internet connectivity and several ICT-based applications. In addition, it is required several awareness sessions for employees to make them aware of new ICT technologies.

The policy implications are also important to implement required enhancements for public service performance. The first set of policies are required for developing intellectual capital in public organizations. These policies should address the recruitment plan for getting competent staff, retention plan to keep recruited well-trained staff and development plan for developing staff competence to achieve organizational performance. The second set of policies should focus on promoting ICT use in organizations. These policies should address investments in ICT tools and technologies, access to ICT applications by employees, maintenance of ICT environment, IT training and security concerns.

Limitations

This study is subject to several limitations, which provide directions for future research. This research study is limited to quantitative research approach. Therefore, it is suggested to apply a qualitative approach in the future to understand how current findings behave with qualitative inputs. In addition, it is better to study the impact of ICT use and intellectual capital on public sector performance with moderating variables such as gender and qualifications of the employees.

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Appendix 1

Table 1: Variable Definitions, Measurement Scales, and Items

Variable	Working Definition	Measurement Scale	Items
Information Communication Technology (ICT) Use	Use of set of tools and resources to communicate and to create, spread, store and manage information.	Likert 5-point	<ol style="list-style-type: none"> 1. Frequent user of organization's ICT and IS. 2. ICT integration in work processes. 3. Use ICT and IS capabilities. 4. Experiment with new IT. 5. First to use new IT. 6. Receptive to new IT.
Innovation	Process used to increase organization value through novelty.	Likert 5-point	<ol style="list-style-type: none"> 1. Pursuit of novel knowledge. 2. Search for the latest technology. 3. Investigation in various directions. 4. Exploration of new areas. 5. Discovery. 6. Breakthrough improvements.
Corporate Entrepreneurship	Attitudes and actions that are required to seize opportunities, take risks, and innovate.	Likert 5-point	<ol style="list-style-type: none"> 1. Dramatic changes in products and service mix over the past three years. 2. Emphasis on major innovations in products and services over the past three years. 3. Tendency for high-risk projects over the past three years. 4. Introduced new products and services over the past three years.
Organization Performance	This includes sales growth, market share, profitability and overall performance.	Likert 5-point	<ol style="list-style-type: none"> 1. High efficiency levels in operations. 2. Productivity is high. 3. Performance better than rivals. 4. Organization's market constantly growing. 5. Customers are satisfied. 6. Overall, company performance is high and improving.
Intellectual Capital	Collection of knowledge, experience, and practical talents that organizations can use to generate value. This covers human capital, structural capital, and relational capital.	Likert 5-point	<p>Human:</p> <ol style="list-style-type: none"> 1. Employees of our enterprise have excellent professional skills in their jobs and functions. 2. The enterprise provides well-designed training programs. 3. Employees are creative in our enterprise. 4. Employees hold suitable work experience for accomplishing their job successfully in our enterprise. <p>Structural:</p> <ol style="list-style-type: none"> 5. Our enterprise responds to changes very quickly. 6. Our enterprise emphasizes new market development. 7. Our enterprise's culture and atmosphere are flexible and comfortable. 8. The overall operations procedure of our enterprise is very efficient. <p>Relational:</p> <ol style="list-style-type: none"> 9. Our enterprise maintains appropriate interactions with its stakeholders. 10. Our enterprise maintains long-term relationships with customers. 11. Our enterprise has stable and good relationships with strategic partners. 12. Our enterprise solves problems through effective collaboration.

