Quest Journal of Management and Social Sciences
Volume 7 Issue 2: 239-261
ISSN Print: 2705-4527
ISSN Online: 2705-4535
Web: https://www.quest.edu.np

Adoption of Information and Communication Technology in Nepalese Small and Medium Enterprises

Sarita Timalsina[1], Ramesh Kunwar[1] & Devi Kumari Poudel[1]*

[1]Quest International College, Pokhara University, Lalitpur Nepal
*Corresponding Author: ramesh@quest.edu.np

Received: 26 July 2025
Revised: 10 Sept 2025
Accepted: 02 Nov 2025
Published: 30 Dec 2025

How to cite this paper:
Timalsina, S., Kunwar, R., & Poudel, D. K. (2025). Adoption of Information and Communication Technology in Nepalese Small and Medium Enterprises. *Quest Journal of Management and Social Sciences, 7*(2), 239-261. https://doi.org/10.3126/qjmss.v7i2.87787

Abstract

Background: Information and Communication Technology (ICT) has become essential for improving efficiency, communication, and competitiveness in modern businesses. However, many SMEs in Nepal still face challenges in adopting digital tools due to limited infrastructure, skills, and resources.

Purpose: The purpose of the study is to identify the overall situation of ICT adoption in Small and Medium Enterprises in Nepal.

Design/methodology/approach: This study is based on the Technological Acceptance Model. This model posits that perceived usefulness and perceived ease of use are two key factors that influence people's acceptance and use of technology. Using a structured questionnaire, data were collected from a primary source. In this study, convenience sampling techniques were employed, with 408 respondents included in the study. Data collection is conducted using the KOBO Toolbox. Structural Equation Modeling is used to examine the overall situation of ICT adoption through descriptive and inferential analysis. The research is based on an explanatory research design.

Findings: The study tested twelve hypotheses related to firm size, resources, perceived usefulness, ease of use, attitude towards using, and actual use behavior. In my research, H1, H4, H11, and H12 do not support the test, and the remaining hypotheses have a significant relationship. The majority of the respondents face the challenge of a lack of knowledge about information communication.

Conclusion: The findings of the study indicate that employees of the SEMs have a positive behavioral intention, influenced by firm size and available resources. The organization should prioritize enhancing technological literacy and ensuring that its human resources are adequately skilled. There should be proper data security and government support. For the better adoption of ICT by SMEs

Keywords: Information communication technology, small and medium enterprise, behavior intention, actual use behavior, attitude and ease of use.

1. Introduction

Information technology (IT) and its broader subset, ICT, have become integral drivers of productivity, innovation, and competitiveness across modern economies. ICT encompasses a range of digital tools and systems that enable the collection, storage, transfer, and manipulation of information for decision-making and communication (Onn & Sorooshian, 2013). It encompasses internet-based technologies, mobile devices, wireless networks, and other digital platforms that have transformed the way individuals and organizations interact and conduct business (Ratheeswari, 2018). From cloud computing and e-commerce to artificial intelligence and data analytics, ICT applications have transformed how institutions operate and connect with global markets. This technological revolution has blurred geographic boundaries, redefined customer relationships, and created new pathways for efficiency and growth across industries.

The diffusion of ICT has been particularly transformative for small and medium-sized enterprises (SMEs), which constitute the backbone of most economies. In a globalized and digitally connected world, the adoption of ICT enables SMEs to enhance operational efficiency, improve communication, and access broader markets. The strategic use of ICT can help firms streamline production processes, optimize supply chains, strengthen customer relationship management, and foster innovation (Iacurci, 2021). While large enterprises often lead in technological investment, SMEs increasingly rely on digital tools to sustain competitiveness and respond to changing consumer demands. The scale and sophistication of adoption, however, vary according to firm size, financial capacity, and managerial capabilities. Micro and small enterprises often depend on basic technologies, such as accounting software, internet connectivity, and social media marketing. In contrast, medium-sized firms adopt more complex systems, including enterprise resource planning (ERP), customer relationship management (CRM), and cloud computing (Siqueira et al., 2022). Regardless of firm scale, ICT adoption has emerged as a critical determinant of SME performance, survival, and long-term growth.

Empirical studies across various contexts have underscored that ICT adoption is not uniform, but rather shaped by organizational characteristics, technological readiness, and external environments. Lavicza et al. (2021) observed that firm size, access to financial resources, and perceived usefulness of technology significantly determine the level of adoption among SMEs. Cassetta et al. (2020) found that ICT adoption depends on the availability of infrastructure, skilled human capital, and supportive policy frameworks that encourage digital transformation. Similarly, Chege and Wang (2020) highlighted that ICT adoption influences business performance both directly through cost reduction and efficiency and indirectly, by promoting sustainable practices and innovation. The interaction of technological, organizational, and environmental dimensions determines how successfully firms integrate ICT into their operations. Nonetheless, despite growing scholarly attention, gaps remain in understanding the linkages between ICT adoption, innovation, and sustainable development, particularly in developing and transitional economies.

In Nepal, ICT has emerged as a catalyst for both economic and social transformation. The increasing penetration of the internet and mobile technologies has expanded opportunities for business growth, service delivery, and governance reform. For SMEs, ICT offers an opportunity to enhance efficiency, promote collaboration, and expand market reach. Lama et al. (2020a) demonstrated that e-commerce platforms have enabled Nepalese SMEs to overcome geographical limitations, enhancing revenue and productivity. Similarly, Kshetri (2007) noted that automation has reduced redundancies and improved decision-making, while Dawadi et al. (2020) emphasized the contribution of ICT to transparency, governance, and innovation. However, the digital transformation journey of Nepalese SMEs remains uneven. Many firms, especially those in rural or resource-constrained settings, face severe challenges, including inadequate infrastructure, weak internet connectivity, limited digital literacy, and high costs associated with technology adoption. These structural barriers limit the ability of SMEs to integrate ICT effectively, thereby reducing their competitiveness in both domestic and global markets.

Evidence from international and regional literature further contextualizes these challenges. Cassetta et al. (2020) identified firm size, age, productivity, and workforce skills as key determinants of ICT adoption, while Adam et al. (2020) found that ICT affects customer relationship management performance, mediated by perceived value. Wendt et al. (2022) emphasized that organizational, technological, and environmental factors interact to shape adoption outcomes. In developing regions, Torres (2021) reported high ICT penetration among Latin American SMEs, whereas Sadiq et al. (2022) revealed that weak government policies impede digital integration in Nigeria. Polas et al. (2022) and Belyaeva et al. (2020) highlighted the influence of competition, regulation, and sustainability pressures on the digital strategies of European SMEs. Studies from Asia, such as those by Nair et al. (2019) and Gamage et al. (2020), have demonstrated that ICT facilitates globalization and marketing innovation. Agyekum et al. (2022) have linked ICT penetration to financial inclusion in Southeast Asia. Within South Asia, Dhakal and Lim (2020) examined ICT indicators in SAARC nations, with a focus on mobile adoption, whereas Ssenyonga (2021) demonstrated how digital divides hindered ICT integration in Indonesia during the COVID-19 pandemic. In Nepal, Dawadi et al. (2020) and Lama et al. (2020) identified both the promise and challenges of ICT adoption, citing infrastructural deficits, digital skill shortages, and weak institutional support as key impediments. Collectively, these studies affirm that firm-specific attributes, government policy environments, and broader socio-economic conditions influence ICT adoption among SMEs. Yet, empirical work focusing on Nepal remains limited, particularly in terms of how SMEs navigate technological and organizational barriers to achieve sustainable digital transformation.

The existing literature thus reveals a clear research gap. Although ICT adoption has been widely studied in other regions, there is a lack of systematic evidence explaining how Nepalese SMEs perceive, adopt, and utilize digital technologies within their unique economic and infrastructural contexts. Prior studies in Nepal have primarily emphasized general ICT growth and governance, but few have investigated the determinants of adoption, perceived benefits, and challenges specific to SMEs. Given Nepal's growing emphasis on entrepreneurship, digital transformation, and integration into the regional digital economy, understanding ICT adoption among SMEs is of both academic and policy relevance.

Against this backdrop, the present study seeks to examine the level, determinants, and challenges of ICT adoption among small and medium-sized enterprises in Nepal. It aims to identify the key drivers influencing adoption, explore the barriers limiting effective implementation, and assess how technological integration contributes to firm competitiveness and sustainable growth. The study contributes to the expanding literature on ICT and SME development by offering empirical insights from a developing economy perspective, where institutional capacity, infrastructure, and human resources remain constrained. The findings are expected to inform policymakers, development agencies, and business associations in formulating evidence-based strategies to promote inclusive and sustainable digitalization. By enhancing the readiness and capability of SMEs to adopt ICT, Nepal can strengthen its entrepreneurial ecosystem, improve productivity, and accelerate its transition toward a knowledge-driven economy.

2. Literature Review

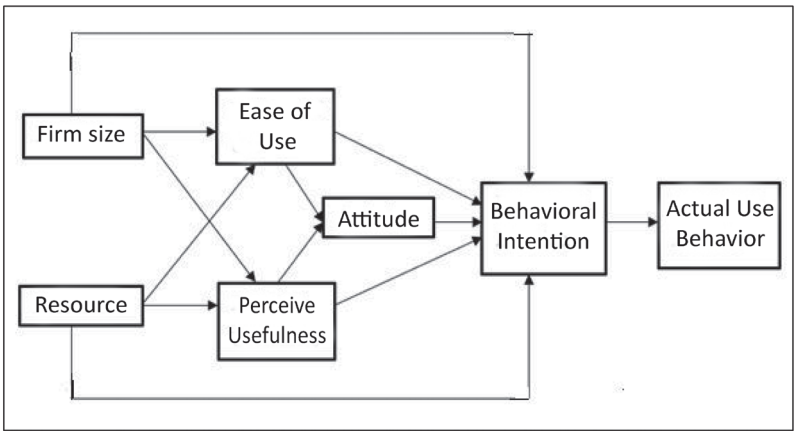
Theoretical Framework and Hypothesis Formulation

This study reviews five major theories related to ICT adoption in Nepalese SMEs: the Technology Acceptance Model (TAM), the Theory of Reasoned Action (TRA), the Theory of Planned Behavior (TPB), the Diffusion of Innovation (DOI), and the Unified Theory of Acceptance and Use of Technology (UTAUT). Among them, TAM is the primary guiding theory, as the study focuses on the adoption of ICT in SMEs. TAM explains adoption through perceived usefulness and perceived ease of use, which shape user attitudes and usage behavior; external factors may also indirectly influence adoption (Sani et al., 2020). TAM has been widely applied in information systems, e-commerce, healthcare, and education (Nazir & Khan, 2022). TRA highlights how attitudes and subjective norms shape behavioral intentions, but is criticized for oversimplifying decision-making; later models, such as TPB, address these gaps (Asvinigita et al., 2022). TPB adds perceived behavioral control and is commonly used to predict behavior

in health, environmental, and consumer studies (Singh et al., 2018; Tommasetti et al., 2018). DOI explains how innovations spread through stages based on perceived benefits, ease of use, and social influence (Shahadat et al., 2023). UTAUT integrates factors such as performance expectancy, effort expectancy, social influence, and facilitating conditions, along with moderating variables like age and experience (Aleke et al., 2011). Overall, TAM is the most suitable model for this study, as it emphasizes perceived usefulness and ease of use, key determinants of ICT adoption, and has been refined repeatedly since its introduction by Davis in 1989.

Integration models are developed by adopting, developing, and adapting ICT adoption models in conjunction with the Technology Acceptance Model. ICT adoption variables consist of Resource (R) and Firm Size (FS), and TAM variables include Perceived Usefulness (PU), Perceived Ease of Use (EOU), Attitude Toward Using (A), and Behavioral Intention to Use (BI). The output is the actual use behavior (AUB). Some previous research has produced positive results regarding the effect of adopting information technology on SMEs, providing a deeper understanding of the importance of technology in business operations and its impact on the company's progress, as well as the acceptance model of technology (TAM). This model analyzes the type of organization and social dimensions of current information system studies, including efficiency, satisfaction, and readiness.

Figure 1: Conceptual Framework



Source: Adopted from Sani's TAM (Sani et al., 2020)

Firm Size

Firm size refers to the scale of a business, measured by the number of employees, revenue, or assets, and is a key indicator of its market position and resource capacity (Kshetri, 2007; Alam et al., 2022). Larger firms often possess greater resources and expertise, which enhances innovation and the perceived usefulness of technologies, although they may face rigidity due to their complex structures (Sani et al., 2020). Conversely, smaller firms, despite limited resources, can exhibit higher agility, adaptability, and user-centered approaches, allowing them to respond swiftly to market and technological changes (Aleke et al., 2011). The relationship between firm size and ease of use is not linear, as usability depends more on design quality, implementation, and support systems than on firm scale (Lama et al., 2020a; De Giovanni & Esposito Vinzi, 2012). Similarly, behavioral intention and technology adoption are shaped not only by firm size but also by organizational culture, leadership, and employee attitudes, with larger firms' resources supporting adoption while smaller ones leverage flexibility (Cassetta et al., 2020; Shahadat et al., 2023b). So, the hypotheses are formulated as follows:

H1: Firm Size has a significant impact on Behavioral Intention (BI)
H2: Firm size has a significant impact on ease of usefulness
H3: Firm size has a significant impact on Perceived Usefulness (PU)

Resource

In the Technology Acceptance Model (TAM), resources refer to the infrastructure, technical support, training, funding, and human capital that facilitate effective technology use (M. P. Singh et al., 2018). Adequate resources reduce barriers, enhance usability, and positively shape users' attitudes and behavioral intentions toward technology adoption (Ioannidis et al., 2014). The availability of infrastructure, guidance, and financial means simplifies user interaction, improving perceived ease of use and overall experience. Moreover, resources strengthen the perceived usefulness of technology by enabling its efficient utilization and maximizing its performance benefits (Simmou et al., 2023). Consequently, sufficient resources increase users' confidence, perceived ease of use, and behavioral intention to effectively adopt and apply technology.

To do so, the study hypothesizes that:

H4: Resource has a significant impact on Behavioral intention (BI)

H5: Resource has a significant impact on ease of usefulness

H6: Resource has a significant impact on Perceived Usefulness (PU)

Attitude (a)

Attitude (A) represents users' emotional and cognitive evaluation of a product or service. At the same time, behavioral intention (BI) reflects their subjective likelihood or willingness to engage in a specific behavior(Fishbein & Ajzen, 1974). Attitude encompasses emotional responses, cognitive evaluations, and overall satisfaction, while behavioral intention is influenced by attitude, perceived usefulness, and perceived ease of use. Positive attitudes are more likely to result in higher behavioral intentions. Designers and marketers strive to create positive attitudes by delivering a satisfying user experience, addressing user needs, and effectively communicating the benefits and value of their products or services. This, in turn, increases users' intentions to engage in desired behaviors.

H7: Attitude has a significant relationship with Behavioral Intention

Behavior intention (bi)

Behavioral intention (BI) refers to an individual's subjective likelihood or willingness to engage in a specific behavior. In contrast, actual use behavior (AUB) represents the real-life actions and engagement exhibited by individuals (Sani et al., 2020). The interconnection between BI and AUB is important for understanding users' intentions and their actual behavior. Ideally, BI and AUB align, indicating that users follow through with their intentions. However, discrepancies can occur due to barriers or changing circumstances. AUB provides feedback that can influence future behavioral intentions. Positive experiences reinforce intentions, while negative experiences may lead to a reevaluation. Understanding the interplay between BI and AUB helps optimize products/services, improve user satisfaction, and drive adoption and retention(Sani et al., 2020).

H8: There is a significant relationship between Behavioral Intentions and actual used behavior.

Ease of use (eou)

Ease of Use (EOU) and attitude are closely linked elements shaping user experience. EOU refers to the simplicity, intuitiveness, and accessibility of a product or service, while attitude encompasses users' emotional and cognitive responses such as satisfaction, enjoyment, trust, and perceived usefulness (Sani et al., 2020). A positive relationship exists between the two products, as they are generally easy to use, which fosters favorable attitudes and higher user satisfaction. In contrast, difficult or frustrating interfaces lead to negative perceptions. EOU also influences behavioral intention (BI), as users are more likely to adopt, continue using, or recommend technologies that are effortless and beneficial (Moons & De Pelsmacker, 2015). Moreover, perceived usefulness reinforces this relationship, since a positive attitude and belief in a product's utility enhance both its acceptance and the practical impact of its outcomes or research findings.

H9: ease of use (EOU) has a significant relation with attitude (A)

H10: Ease of use (EOU) impact on the behavior intention (BI)

H11: There is a relationship between Perceived Usefulness (POU) and Attitude(A)

H12: Perceived Usefulness (POU) has a relationship with Behavioral Intention (BI)

Variable Table and Its Definition

Table 1: Variables and their Definitions

Construct	Indicators	Variables	Details
Perceived usefulness(u) instruments	PU1	Quickness	Using ICT at organizational work would enable me to accomplish tasks more quickly(Ali Abbasi et al., 2022)
	PU2	Work Performance	Using ICT would improve organizational work performance (Sani et al., 2020).
	PU3	Productivity and Efficiency	Using ICT in organizational work would increase my productivity and efficiency(Sani et al., 2020)
	PU4	Decision Making	Using ICT improved decision-making abilities when doing the task (Ali Abbasi et al., 2022)
	PU5	Problem-Solving Behavior	Using ICT enhanced Managers' problem-solving behavior for the task (Ali Abbasi et al., 2022)
	PU6	Understand the task	ICT allowed people to understand the task problem more quickly (Ali Abbasi et al., 2022)
Perceived ease of use (EOU) instruments	EOU1	Easiness	Learning to use ICT would be easy (Iacurci, 2021).
	EOU2	purposive	ICT helps to make more powerful (Iacurci, 2021).
	EOU3	Clearness	ICT provides more clarity of information (Iacurci, 2021).
	EOU4	Believe Ness	Overall, People believe ICT is easy to use (Iacurci, 2021).
	EOU5	Skillful	It would be easy for people to become skillful at using ICT(S, 2021)
	EOU6	Flexible	People would find ICT to be flexible to interact (Iacurci, 2021)
Attitude (A) instruments	A1	Beneficial	ICT is beneficial for the organizations (Iacurci, 2021)
	A2	Positive Behavior	ICT is positive for the business organization (Basyal & Seo, 2017)
	A3	Idea	Using ICT is a wise idea for the Business firm (Basyal & Seo, 2017)
	A4	Worthy	ICT is worth using for business company(Basyal & Seo, 2017)
	A5	Pleasant	Using ICT within the company is pleasant (Basyal & Seo, 2017)
Behavioral intention (BI) instruments	BI1	Access to ICT	Given that People have access to ICT, they plan to use it in the organization(Iacurci, 2021)
	BI2	ICT Use	It is worth using the ICT form from Firm (Iacurci, 2021).
	BI3	Goal	People will use ICT in the future (Iacurci, 2021)
	BI4	Continuous Use	People intend to continue using ICT (Basyal & Seo, 2017)
	BI5	Company Activity	Managers intend to utilize ICT for my company's activities (Basyal & Seo, 2017).

Actual use behavior instruments	AUB1	HRM Use	ICTs are used extensively in the company's human resources department (Iacurci, 2021)
	AUB2	Sales and Marketing Use	ICTs are used extensively in the company's sales and marketing department (Iacurci, 2021)
	AUB3	R&D Use	ICTs are used extensively in the company's research and development (R&D) department (Iacurci, 2021)
	AUB4	Finance Department	ICTs are used extensively in the company's financial department (Iacurci, 2021)
	AUB5	Product department	ICTs are used extensively in the company's production department (Iacurci, 2021)
	AUB6	Communication Development	ICTs are used extensively in the company's communications department (Iacurci, 2021)

3. Research Methods

This study is guided by the research onion framework (Saunders et al., 2019). It adopts a post-positivist philosophy, which recognizes that while an objective reality exists independently, it can only be partially understood through systematic empirical investigation. A deductive approach is employed, moving from established theoretical propositions to hypothesis testing in order to examine causal relationships. The research employs an explanatory design to investigate the cause-and-effect relationships between independent and dependent variables, aiming to explain why specific phenomena occur and to identify relationships that warrant further exploration (Horel et al., 2014; Asad et al., 2018). A mono-method quantitative strategy is applied, with primary data collected through a structured survey using a standardized questionnaire, ensuring consistency, reliability, and validity across respondents. Following data collection, both descriptive and inferential statistical analyses are conducted to test hypotheses and evaluate the proposed causal relationships. This approach allows the study to integrate theoretical expectations with empirical evidence, providing a rigorous assessment of variable interactions. By establishing a clear framework for data collection, measurement, and analysis, the research design ensures methodological rigor, reliability, and generalizability of findings (Lavicza et al., 2021). Overall, this structured design provides a systematic blueprint for understanding the mechanisms underlying the phenomenon under study and for drawing empirically supported conclusions.

This research primarily focuses on Nepal's Bagmati Province, particularly the Kathmandu Valley, which comprises the country's three major cities: Kathmandu, Lalitpur, and Bhaktapur (Lawaju et al., 2023). The Valley serves as the economic and industrial hub of Nepal, hosting a high concentration of business organizations and industrial estates that provide an ideal setting for studying ICT adoption and business practices. Its large number of enterprises ensures a representative and sufficiently diverse sample for measuring organizational performance and technological engagement. Moreover, the Kathmandu Valley's central geographic location makes it easily accessible to researchers, facilitating interaction with various sectors. The region's diversity in workforce composition, organizational structures, and industrial activities further strengthens its suitability as a studyf area. Given the limited 28-day data collection period, focusing on the Kathmandu Valley allows for efficient data gathering while still capturing insights reflective of the broader national context.

The sample size is calculated by using Cochran's formula, $n=(z^2\times p\times q)/e^2$ (Maharjan et al., 2022; Naing, 2003) where n = sample size for study, tabulated value for 5% level of significance (z)=1.96. Prevalence of customers using the brand social media page (p)= 50%=0.5 q = 1-p, =0.5. Allowable error that can be tolerated (e) = 5%. Thus, the sample size for the study is (384.16 + 19.20) = 403.36 (≈ 403).

The pilot survey was conducted to ensure that the techniques, tools, and approaches used in the study were appropriate before collecting the full dataset. Pilot testing helps identify potential issues, improve the reliability of the instruments, and refine the research design. In this study, a pilot survey was conducted on April 26, 2023, with 15 respondents using the KOBO Toolbox to assess the feasibility and effectiveness

of the methodology. The main research instrument consisted of a structured questionnaire developed by reviewing relevant literature and adapting established constructs and variables. Both open-ended and closed-ended questions were included to gather comprehensive information through a combination of questionnaires and participant interviews. Data analysis involved both descriptive statistics, such as mean and median, and inferential analysis using structural equation modeling to identify patterns, estimate parameters, and test hypotheses (Rajbhandari et al., 2022). Tools such as KOBO Toolbox, Microsoft Excel, and PLS-SEM were used for data entry, tabulation, and statistical analysis, with results presented in tables and graphs.

4. Results

Socio-Demographic Information

This section includes the personal and socio-demographic details of the sample that was surveyed. A total of 408 respondents were interviewed in various districts of Nepal, where the majority of respondents were from Kathmandu, Lalitpur, and Bhaktapur.

Table 2**:** Social Demographic Results

Variables	Category	Number	Percentage (%)
Gender	Male	293	71.81
	Female	115	28.19
Age	16-19 Years	3	0.74
	20-29 Years	147	36.3
	30-39 Years	171	41.91
	40-49 Years	80	19.61
	50 years and above	7	1.72
Education level	Illiterate	1	0.25
	Primary level	11	2.7
	Secondary level	139	34.07
	Graduate	194	47.55
	Postgraduate	62	15.2
	Others	1	0.25
Marital status	Married	293	71.81
	Unmarried	114	27.94
	Others	1	0.25
The sector of business associated with	Residential and real estate	3	0.74
	Wholesale and Retail	41	10.05
	Manufacturing	83	20.34
	Construction	21	5.15
	Service	177	43.38
	Others	14	3.43
Location of industry	Kathmandu	148	36.27
	Lalitpur	162	39.71
	Bhaktapur	27	6.62
	Others	71	17.4
Position held in the company	Top-level manager	102	25
	Middle level	144	35.29
	Operational level	133	32.6
	Others	29	7.11
Monthly income (in average)	Below 20,000	32	7.84
	20,000 to 40,000	162	39.71
	40,000 to 60,000	109	26.72
	60,000 to 80,000	48	11.76
	80,000 to 100,000	24	5.88
	100,000 above	33	8.09

No of employee working with	Less than 20	229	56.13
	20 to 40	64	15.69
	40 to 60	20	4.9
	60 and above	95	23.28

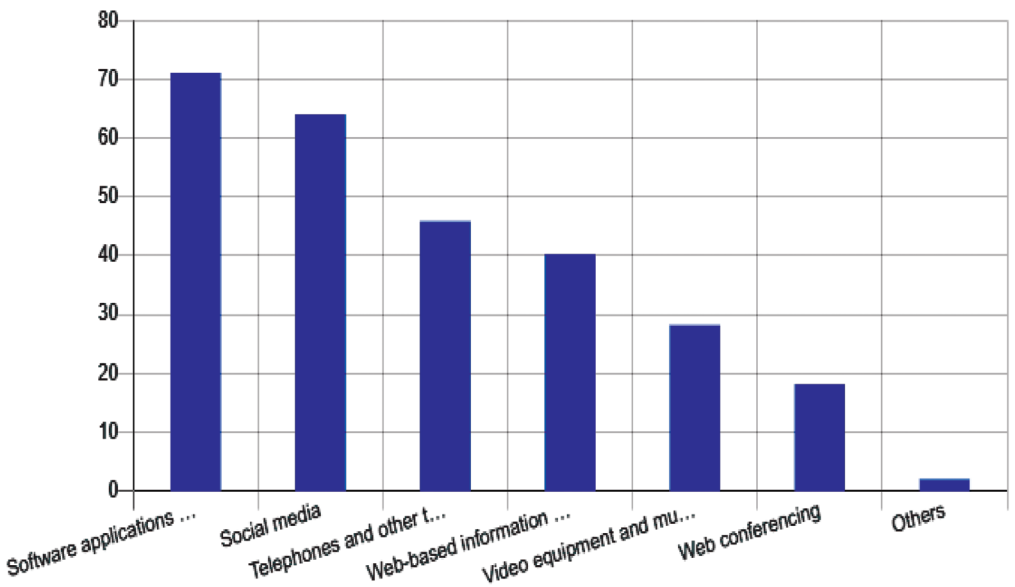
Source: Field Study, 2023

The study analyzed the demographic characteristics of employees in small and medium enterprises (SMEs) and found that the majority were male (71.81%). In comparison, females constituted 28.19%, indicating a notable gender imbalance that may affect diversity and inclusivity within the sector. Most respondents were aged 30–39 years (41.91%) and married (71.81%), suggesting a workforce in its mid-career stage seeking professional growth and stability. Nearly half of the participants (47.55%) were graduates, with many holding master's degrees, underscoring the growing importance of education and its contribution to innovation, technological adoption, and organizational competitiveness. In terms of enterprise classification, 56.13% of employees worked in firms with fewer than 20 employees, highlighting the predominance of small enterprises. Sector-wise, the service industry accounted for the largest share (43.38%), followed by manufacturing, trading, and retail, reflecting that service-oriented SMEs in Nepal are leading in ICT adoption and digital transformation compared to other sectors.

General Understanding of Information Communication Technology

Most employees appear to be familiar with information and communication technology, with a good understanding (97.79%) in the workplace. This means that employees are aware of information and communication technology and may be willing to engage in efforts to improve it. Thus, this section serves as a demonstration of the general level of knowledge regarding information and communication technology in Nepal. The results of the study on information and communication technology show that most employees have multiple views of ICT. Most of them said that it is software applications (71.08%), social media (63.97%), telephones and other telecommunications products (44.83%), web-based information and applications (40.2%), video equipment and multimedia products (28.19%), web conferencing (18.14%), and others (1.96%. In the case of social media, most people use Facebook as a communication technology.

Figure 2: General Understanding of Information Communication Technology.

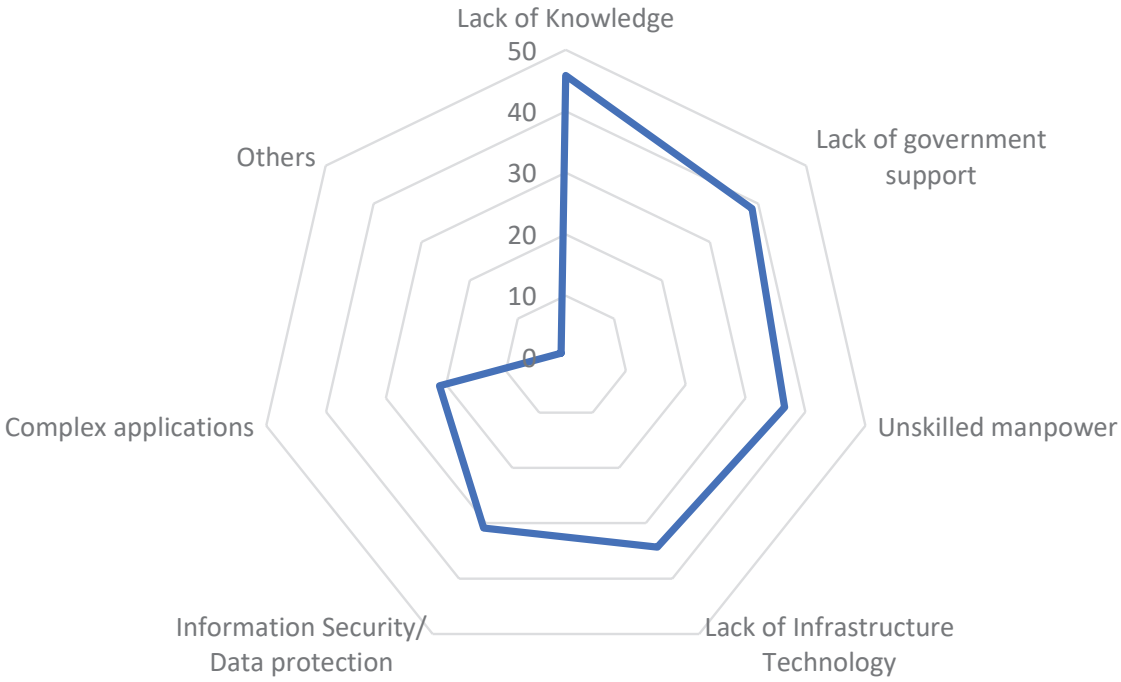


Source: Field Study, 2023

Challenges and Managerial Solutions

This section offers valuable insights into ICT adoption-related challenges faced by employees in SMEs in Nepal. During data collection, the researcher asked the respondents if they faced any challenges in adopting ICT. The majority responded positively (84.07%), and 13.24% responded negatively.

Figure 3: Challenges of Information Communication Technology Adoption



Source: Field Study, 2023

Several challenges can have a negative impact on ICT adoption. Lack of knowlease (45.83%), lack of government support (38.73%), unskilled manpower (36.52%), lack of infrastructure technology (34.31%), information security and data protection (30.88%), complex applications (21.08%), low level of data backup and server issues along with potential hacking and stealing of data (0.25), and misuse of information (0.25)

According to the collected data, technological literacy (49.75%) is one of the most effective solutions for providing brief knowledge about the utilization and operation of technology. Government support (44.61%), skilled human resources (36.76%), proper infrastructure development (33.58%), information security (27.21%), and usable applications (21.08%) suggest that digitization has started in many businesses. Still, employees themselves are not fully aware of technology. The policy level is weak in many instances in supporting data security and cybersecurity. These measures can serve as a managerial solution for the better adoption of information and communication technology in small and medium enterprises in Nepal.

Inferential Analysis

Due to its suitability for non-normal distributions frequently encountered in survey research, partial least squares (PLS) modeling is conducted using SmartPLS 4.0 as the statistical tool (Ringle et al., 2015). To test a hypothesis, estimate parameters, infer associations with caution, and generalize about a population based on sample data, inferential analysis is utilized. Since there is only one source of data, we initially examined common method bias by assessing collinearity, as suggested by Shuck et al. (2011).

Common Method Bias

The systematic error that happens when using self-reported data in research is referred to as the "common method bias." Due to the shared measurement approach used in this study, the correlation between two or more variables is inflated, which is the opposite of what their true relationship would suggest (Kock, 2015). Every VIF in the outer model is less than 5, hence it complies with the condition of being less than 5 (J. Hair et al., 2017; Lawaju et al., 2024). Therefore, the model is unaffected by the standard technique.

Table 3: VIF Table for Common Method Biased

	R	A	AUB	BI	EOU	FS	PU
VIF	2.21	2.112	2.187	2.837	3.747	1.057	2.992

Source: Field Study, 2023

Measurement Model Assessment Result

The measurement of the outer model is examined by assessing internal consistency using composite reliability, despite Cronbach's alpha evaluations having become a standard process in research (J. F. Hair et al., 2014). A non-significant influence of this construct on Autonomy was found after rerunning the PLS analysis and switching the resource sharing assessment method from formative to reflective (Coltman et al., 2008).

This research aimed to assess a created model in two stages: first, a measurement model test was conducted to evaluate reliability and validity based on recommendations, followed by a structural model test to evaluate the hypotheses proposed by J. F. Hair et al. (2020). The researcher achieved AVE and CR values, establishing suitable loadings for each study goal. According to Khan and Yu (2020), the loadings value should be 0.5, the AVE should be 0.5, and the CR should be 0.7. When all the constructs have AVE values greater than 0.5, convergent validity is determined using AVE (Asadi et al., 2020; Dhakal et al., 2023). Since 0.70 is sufficiently close to 0.708, it is typically considered acceptable. AVE values should be greater than 0.5, signifying that at least 50% of the variance of the indicator should be considered. However, an AVE of less than 0.50 implies that the notion cannot fully account for the items' correctness (J. F. Hair et al., 2014).

Table 4: Construct Reliability Assessment Results

Variables	Items	Loading	Cronbach's alpha	CR	AVE
Attitude	a1	0.677	0.861	0.9	0.642
	a2	0.723			
	a3	0.801			
	a4	0.846			
	a5	0.826			
Actual Use Behavior	aub2	0.811	0.82	0.881	0.649
	aub3	0.736			
	aub5	0.795			
	aub6	0.706			
	aub7	0.752			

Behavioral Intention	bi1	0.651	0.839	0.884	0.604
	bi2	0.746			
	bi3	0.746			
	bi4	0.794			
	bi5	0.819			
Ease of Use	eou1	0.691	0.818	0.873	0.579
	eou2	0.736			
	eou3	0.791			
	eou4	0.791			
	eou5	0.811			
	eou6	0.796			
Firm Size	fs1	0.788	0.809	0.867	0.568
	fs2	0.803			
	fs3	0.86			
	fs4	0.769			
	fs5	0.784			
Perceive Usefulness	pu1	0.711	0.862	0.897	0.594
	pu2	0.769			
	pu3	0.821			
	pu4	0.83			
	pu5	0.793			
	pu6	0.755			
Resource	r1	0.802	0.871	0.903	0.61
	r2	0.813			
	r3	0.811			
	r4	0.796			

Note: AVE = Average Variance Extracted, CR = Composite Reliability (rho_c),

The composite reliability and average variance inflator are above the required levels, i.e., 0.5 and 0.7, respectively; factor loading is reliable (J. F. Hair et al., 2014). This is further demonstrated in Table 3. Additionally, the average variance extracted (AVE), which measures the degree to which the components of the concept are related to one another, is used to assess the model's convergent validity. According to Fornell and Larcker (1981), an AVE value greater than 0.5 is a trustworthy indicator of convergent validity. All results exceeded the recommended level, and all scores were higher than 0.5. A few of the items' structures were removed to meet the AVE's minimal acceptability threshold, as stated in the table.

To assess discriminant validity, a measure of how dissimilar one component of the model is from the other construct, the Fornell-Larcker criterion can be utilized (Fornell & Larcker, 1981). According to Henseler et al. (2015), Fornell and Lacker alone are insufficient to confirm discriminant validity, and that the cross-loading approach and the Heterotrait-Monotrait (HTMT) ratio scale are supplementary measures to evaluate discriminant validity.

The Fornell and Lacker criterion is satisfied because the AVE square roots were larger than the corresponding correlations (Hair et al., 2020).

Table 5: Discriminant Validity- Fornell and Larcker Criterion

	FS	R	A	AUB	BI	EOU	PU
FS	**0.801**						
R	0.719	**0.805**					
A	0.556	0.566	**0.777**				
AUB	0.695	0.66	0.628	**0.761**			
BI	0.654	0.636	0.688	0.682	**0.754**		
EOU	0.76	0.725	0.704	0.727	0.736	**0.77**	
PU	-0.768	-0.713	-0.637	-0.677	-0.71	-0.804	**0.781**

Source: Field Survey, 2023

The core of HTMT is the estimation of the correlation between the components. Discriminant validity is shown to be based on the HTMT ratio (Muangmee et al., 2021). The HTMT threshold, however, is a topic of debate in the literature. Henseler et al. (2015) advocated for a liberal criterion of 0.90 or less, whereas Kline (2018) favored a more restrictive threshold of 0.85 or less. From the results, all variable values are less than 0.85 compared to their own values.

Table 6: Heterotrait -Monotrait Ratio (HTMT)

	FS	R	A	AUB	BI	EOU	PU
FS							
R	0.849						
A	0.611	0.653					
AUB	0.82	0.803	0.731				
BI	0.765	0.772	0.808	0.829			
EOU	0.881	0.859	0.791	0.86	0.864		
PU	0.885	0.841	0.709	0.799	0.832	0.928	

Source: Field Survey, 2023

Because the ratio between the two constructs is smaller than 0.90, the evaluations of HTMT values also demonstrated discriminant validity (Henseler et al., 2015; Wen et al., 2022). Table 6 demonstrates the discriminant validity of the study by showing that all HTMT ratios are below the threshold value of 0.9.

Cross-loadings were applied to support the validity of the discriminant. Cross-loading occurs when an item has a strong effect on its own parent construct rather than on the other construct under investigation (Henseler et al., 2015). Each item has stronger factor loadings on the underlying constructs to which it belongs than on any other construct, according to Table 6 (Iddagoda et al., 2023). There is also no cross-loading issue because the item's cross-loading values with other constructions are less than 0.7 (Hair et al., 2020).

Table 7: Discriminant Validity – Cross Loadings

	A	aub	bi	Eou	FS	Pu	R
a1	0.677	0.312	0.421	0.375	0.23	-0.318	0.283
a2	0.723	0.377	0.437	0.375	0.248	-0.329	0.313
a3	0.801	0.507	0.515	0.548	0.451	-0.465	0.432
a4	0.846	0.579	0.613	0.657	0.548	-0.616	0.53
a5	0.826	0.583	0.632	0.678	0.561	-0.637	0.554
aub2	0.52	0.811	0.545	0.598	0.559	-0.553	0.546
aub3	0.448	0.736	0.505	0.524	0.502	-0.497	0.477
aub5	0.462	0.795	0.533	0.583	0.594	-0.516	0.52
aub6	0.453	0.706	0.456	0.422	0.426	-0.447	0.439
aub7	0.503	0.752	0.547	0.617	0.546	-0.553	0.519
bi1	0.45	0.44	0.651	0.393	0.374	-0.427	0.39
bi2	0.516	0.484	0.746	0.519	0.476	-0.534	0.489
bi3	0.468	0.475	0.746	0.5	0.425	-0.455	0.433
bi4	0.488	0.527	0.794	0.587	0.517	-0.566	0.474
bi5	0.641	0.617	0.819	0.719	0.627	-0.653	0.583
eou1	0.454	0.503	0.501	0.691	0.512	-0.537	0.524
eou2	0.488	0.567	0.533	0.736	0.58	-0.614	0.543
eou3	0.569	0.556	0.593	0.791	0.602	-0.61	0.584
eou4	0.56	0.578	0.558	0.791	0.62	-0.652	0.565
eou5	0.58	0.581	0.619	0.811	0.579	-0.665	0.582
eou6	0.589	0.574	0.593	0.796	0.617	-0.634	0.554
fs1	0.491	0.547	0.578	0.625	0.788	-0.628	0.627
fs2	0.473	0.607	0.592	0.606	0.803	-0.634	0.612
fs3	0.472	0.611	0.53	0.657	0.86	-0.665	0.59
fs4	0.374	0.487	0.439	0.546	0.769	-0.564	0.527
fs5	0.404	0.519	0.464	0.606	0.784	-0.576	0.513
pu1	-0.485	-0.48	-0.509	-0.578	-0.549	0.711	-0.548
pu2	-0.505	-0.497	-0.536	-0.608	-0.589	0.769	-0.545
pu3	-0.512	-0.548	-0.601	-0.672	-0.595	0.821	-0.588
pu4	-0.547	-0.591	-0.633	-0.664	-0.64	0.83	-0.575
pu5	-0.469	-0.53	-0.557	-0.615	-0.623	0.793	-0.529
pu6	-0.463	-0.52	-0.477	-0.629	-0.598	0.755	-0.554
r1	0.423	0.531	0.491	0.516	0.55	-0.516	0.802
r2	0.475	0.516	0.542	0.55	0.566	-0.545	0.813
r3	0.449	0.547	0.522	0.667	0.674	-0.642	0.811
r4	0.474	0.528	0.492	0.591	0.516	-0.584	0.796

Source: Field Survey, 2023

To achieve a reasonable fit between the model and the data, the SRMR value should be less than 0.1 or 0.08 (Johnson et al., 2019), and the NFI value should range from 0 to 1 (Gerbing & Anderson, 1992; J. Hair et al., 2017). As indicated in the table, the SRMR value is 0.067, and the NFI value is 0.785, both of which fall below the necessary threshold values, indicating a good enough goodness of fit (GOF) between the model and the data.

Table 8: Goodness of Fit Assessment Result

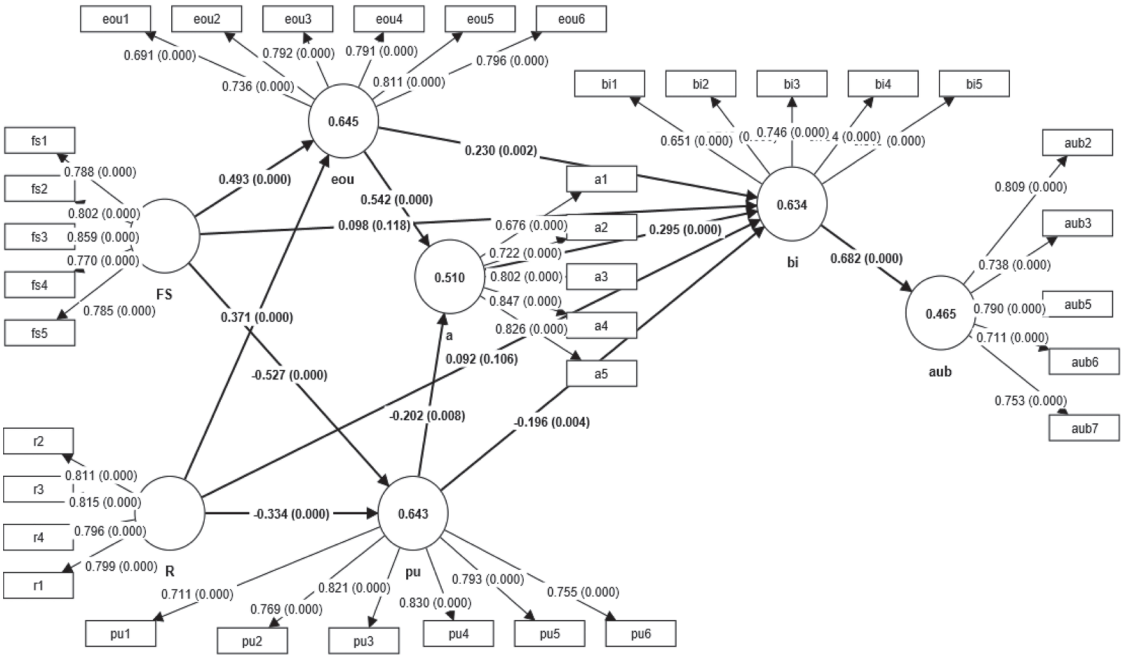
	Saturated model	Estimated model
SRMR	0.067	0.073
d_ULS	2.968	3.533
d_G	0.831	0.89
Chi-square	1988.228	2044.536
NFI	0.785	0.778

Source: Field Survey, 2023

Structural Model Assessment Result

To use PLS-SEM before using a structural equation model (SEM), it is advised to test for multivariate normality (Polas et al., 2022). This study evaluated multivariate skewness and kurtosis as recommended. In addition, if the p-value is less than 0.05 in a 0.05 significance level p-value test of a hypothesis, the hypothesis is accepted; otherwise, it is rejected (Kock, 2015). Similarly, this study does a confidence interval test; the hypothesis is accepted if the value zero does not fall within the upper and lower boundaries. Prior research has shown that even when the p-value is small, the hypothesis is still accepted if the value of zero does not fall within the upper and lower bounds of the confidence interval (Hair et al., 2020; Henseler, 2017). The hypothesis is tested using structural equation modeling with partial least squares (PLS), which examines the probability value and t-statistics. To check for normality and determine whether our data is normal, we use Web Power to assess the multivariate skewness and kurtosis. When both skewness and kurtosis are close to 0, the answers to the pattern are considered to have a normal distribution (Hair et al., 2014; Kock, 2015). In bootstrapping, subsamples are generated from the original dataset using randomly chosen observations (with replacement). After that, the subsample of 10,000 is used to estimate the route analysis process model (Hair et al., 2020)confirmatory composite analysis (CCA. We then presented the path coefficients, standard errors, t-values, and p-values for the structural model using a 10,000-sample re-sample bootstrapping approach.

Figure 4: Structural Model



Source: Author's calculation 2023

The R2 value in a structural model, which represents the predictive capacity of the model as the amount of variation explained by the model constructs, is shown together with the coefficient (Hair et al., 2017). As stated, the structural model is employed in PLS-SEM to estimate path coefficients, test hypotheses regarding the relationships between latent variables, and assess the model's overall data fit. Greater explanatory power is shown by higher R2 values, which range from 0 to 1. According to Wang et al. (2020), the temperature value of pixels with R2 less than the fractile-fractile threshold is set to zero to enhance the contrast between defect and non-defect pixels. In a prior test, the study revealed that the fractile thresholds of 65 percent, 75 percent, and 85 percent for the remaining R2 set have the best performance. The model explains 46.50 percent of the variance in actual use behavior (AUB).

The results of the inner structural model are evaluated to test the study's hypothesis by assessing the t-values, p-values, and confidence intervals for all structural path coefficients (Polas et al., 2022). The empirical t-value must be greater than the critical value for the coefficient to be deemed statistically significant at a certain error probability. In addition, if the p-value is less than 0.05 in a 0.05 significance level p-value test of a hypothesis, the hypothesis is accepted; otherwise, it is rejected (Kock, 2015).

Table 9: Hypothesis Testing Assessment Result

Hypothesis	Path	Beta Value	T-Value	95% Confidence Interval		P values	Results
				LL	UL		
H1	FS -> BI	0.098	1.562	-0.028	0.216	0.118	Rejected
H2	FS -> EOU	0.493	10.909	0.405	0.584	0	Accepted
H3	FS -> PU	-0.527	9.202	-0.637	-0.411	0	Accepted
H4	R -> BI	0.092	1.618	-0.022	0.201	0.106	Rejected
H5	R -> EOU	0.371	7.771	0.275	0.462	0	Accepted
H6	R -> PU	-0.334	5.764	-0.45	-0.221	0	Accepted
H7	A -> BI	0.295	5.114	0.185	0.412	0	Accepted
H8	BI -> AUB	0.682	22.639	0.614	0.734	0	Accepted
H9	EOU -> A	0.542	7.144	0.384	0.683	0	Accepted
H10	EOU -> BI	0.23	3.169	0.092	0.378	0.002	Accepted
H11	PU -> A	-0.202	2.653	-0.352	-0.054	0.008	Rejected
H12	PU -> BI	-0.196	2.873	-0.332	-0.064	0.004	Rejected

5. Discussion

ICTs, or Information and Communication Technologies, encompass a diverse array of computerized tools and systems. These technologies encompass devices such as desktop computers, laptops, and handheld devices. They also include both wired and wireless intranet connections, as well as various software applications for business productivity, such as text editors and spreadsheets. Additionally, enterprise software, data storage solutions, and network security measures are integral parts of ICTs. In essence, ICTs comprise a comprehensive range of computer-based technologies that facilitate information processing, communication, and storage across different domains and industries.

The purpose of this study is to understand how the adoption of information and communication technology (ICT) in small and medium-sized enterprises (SMEs) affects their operational procedures. Although this topic is underdocumented in prior research, there is a gap in the literature regarding the evaluation of a particular industry, especially SMEs, and considering factors such as available resources and business size.

When it comes to using ICT, SMEs confront particular difficulties and opportunities. Understanding how people overcome these obstacles and utilize the available resources can provide valuable insights into effective adoption strategies. The adoption process in SMEs can be significantly impacted by factors such as financial limitations, a lack of IT knowledge, and the need to integrate technology with business objectives.

The study can delve deeper into the unique issues and requirements that SMEs in that area confront by focusing on a particular industry. ICT adoption may be influenced by distinct contextual circumstances and varying technological requirements that are specific to different sectors. To offer personalized advice and solutions for ICT adoption within SMEs operating in a specific sector, it is therefore helpful to study that sector.

Additionally, taking aspects like business size and available resources into account will provide a thorough investigation of how these elements affect the adoption process. The adoption of ICT can be influenced by the availability of resources, including financial, technological, and human resources. The organizational structure, decision-making procedures, and capacity to invest in and deploy ICT solutions may also be influenced by the corporate size.

The purpose of this study is to assess the comprehension of information and communication technology (ICT) adoption among small and medium enterprises (SMEs). By examining the general understanding of ICT adoption in this context, the study aims to gain insights into the level of knowledge and awareness among SMEs regarding the benefits, challenges, and strategies associated with adopting ICT. This assessment provides a foundation for identifying gaps and areas of improvement in SMEs' understanding of ICT adoption, which can guide future interventions and support mechanisms to enhance their utilization of technology for business growth and development.

The goal of this study is to identify the critical variables that significantly influence the adoption of information and communication technology (ICT). The study aims to identify the primary drivers and impediments that influence organizations' decisions regarding the adoption of ICT by examining various variables and circumstances. Financial resources, technology infrastructure, corporate culture, management support, employee skills, public regulations, market competitiveness, and perceived risks and benefits are a few examples of these variables. Businesses and governments may create successful strategies and actions to promote and encourage the adoption of ICT in various contexts by having a thorough understanding of the key factors influencing ICT adoption.

The primary objective of this study is to identify and understand the primary obstacles that small and medium-sized enterprises (SMEs) encounter when implementing information and communication technology (ICT). The study aims to provide insight into obstacles such as constrained financial resources,

a lack of technical competence, opposition to change, compatibility problems, cybersecurity concerns, and inadequate infrastructure by examining the specific challenges encountered during the ICT adoption process. The ability to pinpoint these issues will help policymakers, industry professionals, and SME owners develop targeted strategies and support systems to overcome these obstacles and promote successful ICT adoption within the SME sector. Determining these issues will provide insightful information about the specific challenges faced by SMEs in adopting ICT.

We can consider several managerial strategies to address the issues related to the adoption of ICT in enterprises. The first step is to create a clear ICT adoption strategy and roadmap. This entails performing a thorough analysis of the organization's present capabilities and requirements, identifying achievable targets, and outlining a step-by-step implementation strategy. To improve employees' technological abilities and ensure a seamless adoption, training and assistance are crucial. Third, financial restrictions can be eased by assigning adequate financial resources and considering cost-effective alternatives. Fourth, fostering a culture of innovation and openness to change can help overcome opposition to the use of ICT. Effective change management techniques can also be used. Finally, collaborating with other specialists and leveraging government backing and initiatives can help increase resources and direction.

This study examines the actual use of information and communication technology (ICT) in small and medium-sized enterprises (SMEs) in Nepal. It makes a valuable contribution to the existing literature on ICT adoption by providing an in-depth analysis of the Nepalese context. The research holds both theoretical and practical significance. Theoretically, it expands the theoretical understanding of ICT adoption by exploring its usage patterns and factors influencing adoption in a specific geographical and cultural setting.

Practically, the study offers practical implications for SME owners in Nepal who are considering the adoption of ICT. The findings can guide them in understanding the benefits, challenges, and best practices associated with ICT implementation. Moreover, it provides insights into the experiences and perspectives of SMEs in Nepal, serving as a reference for further research on the same topic in similar contexts.

The study is also beneficial for those who utilize ICT for business purposes, as it provides insight into how SMEs currently employ ICT. When choosing ICT goods and services, they can use this information to make educated judgments. The study is useful for businesses that provide ICT-related goods and services, as it provides information about the Nepali market and potential clientele.

The study is important for future researchers who wish to explore related subjects. It lays the groundwork for further research by indicating areas that require additional inquiry and possible directions for study. By investigating ICT usage in Nepalese SMEs, this study adds to the body of knowledge on ICT adoption. It provides market data for ICT enterprises, insights for ICT consumers, practical implications for SME owners, and a foundation for further study. The results of this study have the potential to contribute to the expansion and development of the ICT industry in Nepal, enabling stakeholders to make informed decisions.

6. Conclusion

This study has four key objectives. Firstly, to examine the general understanding of ICT adoption among SME. Secondly, to identify the major factors affecting ICT adoption. Thirdly, to identify the major challenges of ICT adoption for SMEs and, finally, to provide managerial solutions to mitigate challenges related to ICT adoption. The Study on ICT adoption in SMEs in Nepal aims to investigate the trends, obstacles, and effects of ICT adoption in the context of Nepalese small and medium businesses. The goal of this study is to advance knowledge of the factors influencing ICT adoption in Nepal and to provide insights into the current state of ICT adoption. The study suggests implementing focused training programs, establishing support systems, increasing awareness, and enacting supportive legislation to encourage ICT adoption among SMEs in Nepal. In conclusion, the Study on ICT adoption in SMEs in Nepal emphasizes

the significance of technology adoption for corporate growth. It highlights issues and offers suggestions to improve ICT literacy, overcome budgetary constraints, and foster an environment that encourages SMEs to adopt and utilize ICT for success and competitiveness.

The study recommends that promoting digital inclusion in Nepal requires strengthening both education and ICT infrastructure to ensure equitable access across socioeconomic and geographic divides. Efforts should prioritize affordability, accessibility, and digital literacy, while expanding reliable internet connectivity, particularly in rural areas. Skilled labor is identified as essential for effective ICT implementation, emphasizing the need for professionals trained in programming, cybersecurity, data analysis, and software development to foster innovation and adaptability amid rapid technological change. Information security is also highlighted as a critical concern, necessitating robust measures such as encryption, access control, regular updates, and compliance with data protection laws to safeguard sensitive data and ICT networks. Additionally, the study highlights the need for further research on ICT adoption in Nepalese SMEs, particularly its impact on operations, marketing, and innovation, as well as the challenges faced by rural enterprises. It suggests expanding future studies to include a larger and more diverse sample, covering all enterprise types, to provide a more comprehensive understanding of ICT dynamics and guide effective digital transformation policies in Nepal.

References

Adam, I. O., Alhassan, M. D., & Afriyie, Y. (2020). What drives global B2C E-commerce? An analysis of the effect of ICT access, human resource development and regulatory environment. *Technology Analysis and Strategic Management*, *32*(7), 835–850. https://doi.org/10.1080/09537325.2020.1714579

Agyekum, F. K., Reddy, K., Wallace, D., & Wellalage, N. H. (2022). Does technological inclusion promote financial inclusion among SMEs? Evidence from South-East Asian (SEA) countries. *Global Finance Journal*, *53*(February), 100618. https://doi.org/10.1016/j.gfj.2021.100618

Alam, K., Ali, M. A., Erdiaw-Kwasie, M., Shahiduzzaman, M., Velayutham, E., Murray, P. A., & Wiesner, R. (2022). Impact of ICTs on Innovation and Performance of Firms: Do Start-ups, Regional Proximity and Skills Matter? *Sustainability (Switzerland)*, *14*(10), 1–18. https://doi.org/10.3390/su14105801

Aleke, B., Ojiako, U., & Wainwright, D. W. (2011). ICT adoption in developing countries: Perspectives from small-scale agribusinesses. *Journal of Enterprise Information Management, 24*(1), 68–84. https://doi.org/10.1108/17410391111097438

Aleke, B., Ojiako, U., & Wainwright, D. W. (2011). ICT adoption in developing countries: Perspectives from small-scale agribusinesses. *Journal of Enterprise Information Management*, *24*(1), 68–84. https://doi.org/10.1108/1741039111109743

Ali Abbasi, G., Abdul Rahim, N. F., Wu, H., Iranmanesh, M., & Keong, B. N. C. (2022). Determinants of SME'S's Social Media Marketing Adoption: Competitive Industry as a Moderator. *SAGE Open*, *12*(1). https://doi.org/10.1177/21582440211067220

Amrhein, V., Greenland, S., & McShane, B. (2019). Scientists rise up against statistical significance. *Nature*, *567*(7748), 305–307. https://doi.org/doi.org/10.1038/d41586-019-00857-9

Asvinigita, L. R. M., Piartrini, P. S., Suprapti, N. W. S., & K, I. G. N. J. A. W. (2022). Application of Theory of Reasoned Action (TRA) to Explain Continued Intention to Adopt (CIA) MHealth Services. *Webology, 19*(1), 4952–4966. https://doi.org/10.14704/web/v19i1/web19332

Basyal, D. K., & Seo, J.-W. (2017). Employees' Resistance to Change and Technology Acceptance in Nepal. *South Asian Studies*, *32*(2), 349–362. http://journals.pu.edu.pk/journals/index.php/IJSAS/article/view/3114

Belyaeva, Z., Rudawska, E. D., & Lopatkova, Y. (2020). Sustainable business model in food and beverage industry – a case of Western and Central and Eastern European countries. *British Food Journal*, *122*(5), 1573–1592. https://doi.org/10.1108/BFJ-08-

Cassetta, E., Monarca, U., Dileo, I., Di Berardino, C., & Pini, M. (2020). The relationship between digital technologies and internationalisation. Evidence from Italian SMEs. *Industry and Innovation*, *27*(4), 311–339. https://doi.org/10.1080/13662716.2019.1696182

Chege, S. M., & Wang, D. (2020). The influence of technology innovation on SME's performance through environmental sustainability practices in Kenya. *Technology in Society*, *60*(September 2019), 101210. https://doi.org/10.1016/j.techsoc.2019.101210

Davis, F. D. (1985). A technology acceptance model for empirically testing new end-user information systems: Theory and results. *Management*, *Ph.D.*(May), 291. https://doi.org/oclc/56932490

Dawadi, B. R., Rawat, D. B., Joshi, S. R., & Keitsch, M. M. (2020). Towards energy efficiency and green network infrastructure deployment in Nepal using software defined IPv6 network paradigm. *Electronic Journal of Information Systems in Developing Countries*, *86*(1), 1–24. https://doi.org/10.1002/isd2.12114

De Giovanni, P., & Esposito Vinzi, V. (2012). Covariance versus component-based estimations of performance in green supply chain management. *International Journal of Production Economics*, *135*(2), 907–916. https://doi.org/10.1016/j.ijpe.2011.11.001

Dhakal, K., Baczar, P., Devkota, N., Paudel, U. R., & Szabó, S. (2023). Institutional perception of E-recruitment adoption in Nepal: Evidence from structural equation modeling. *Economics & Sociology*, *16*(3), 227-248.

Dhakal, T., & Lim, D. E. (2020). Understanding ICT adoption in SAARC member countries. *Letters in Spatial and Resource Sciences*, *13*(1), 67–80. https://doi.org/10.1007/s12076-020-00245-2

Fishbein, M., & Ajzen, I. (1974). Attitudes towards objects as predictors of single and multiple behavioral criteria. *Psychological Review*, *81*(1), 59–74. https://doi.org/10.1037/h0035872

Gamage, S. K. N., Ekanayake, E. M. S., Abeyrathne, G. A. K. N. J., Prasanna, R. P. I. R., Jayasundara, J. M. S. B., & Rajapakshe, P. S. K. (2020). A review of global challenges and survival strategies of small and medium enterprises (SME's). *Economies*, *8*(4). https://doi.org/10.3390/ECONOMIES8040079

Giovanni, P. De. (2012). Do internal and external environmental management contribute to the triple bottom line? *International Journal of Operations & Production Management*, *32*(3), 265–290. https://doi.org/10.1108/01443571211212574

Hair, J. F., Howard, M. C., & Nitzl, C. (2020). Assessing measurement model quality in PLS-SEM using confirmatory composite analysis. *Journal of Business Research*, *109*(1), 101–110. https://doi.org/10.1016/j.jbusres.2019.11.069

Hair, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *European Business Review*, *26*(2), 106–121. https://doi.org/10.1108/EBR-10-2013-0128

Hariyati, H., Nuswantara, D. A., Hidayat, R. A., & Putikadea, I. (2022). Management accounting information system and intellectual capital: a way to increase SME'S's business performance. *Jurnal Siasat Bisnis*, *27*(1), 61–75. https://doi.org/10.20885/jsb.vol27.iss1.art5

Horel, T., Ioannidis, S., & Muthukrishnan, S. (2014). Budget feasible mechanisms for experimental design. *Lecture Notes in Computer Science (Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, *8392 LNCS*, 719–730. https://doi.org/10.1007/978-3-642-54423-1_62

Iacurci, L. (2021). A Study of the Technology Acceptance Model for Social Media Adoption in Small & Medium Enterprises. *Honors Projects in Marketing*, *April*. https://digitalcommons.bryant.edu/honors_marketing/37

Ioannidis, J. P. A., Greenland, S., Hlatky, M. A., Khoury, M. J., Macleod, M. R., Moher, D., Schulz, K. F., & Tibshirani, R. (2014). Increasing value and reducing waste in research design, conduct, and analysis. *The Lancet*, *383*(9912), 166–175. https://doi.org/10.1016/S0140-6736(13)62227-8

Kothari, C. R. (2015). *Research Methodology Methods and Techniques* (Second Rev). NEW AGE INTERNATIONAL (P) LIMITED.

Kshetri, N. (2007). Barriers to e-commerce and competitive business models in developing countries: A case study. *Electronic Commerce Research and Applications*, *6*(4), 443–452. https://doi.org/10.1016/j.elerap.2007.02.004

Lama, S., Pradhan, S., & Shrestha, A. (2020a). Exploration and implication of factors affecting e-tourism adoption in developing countries: a case of Nepal. *Information Technology and Tourism*, *22*(1), 5–32. https://doi.org/10.1007/s40558-019-00163-0

Lavicza, Z., Fenyvesi, K., Lieban, D., Park, H., Hohenwarter, M., Mantecon, J. D., & Prodromou, T. (2021). This is a self-archived version of an original article. This version may differ from the original in pagination and typographic details. *Business and Society*, *60*(2), 420–453.

Lawaju, P., & KC A, D. N. (2024). Exploring post-COVID-19 travel intentions of foreign tourists in Nepal: An empirical study using structural equation modeling. *Smart Tourism*, *5*(2), 2779.

Lawaju, P., Awale, P., Basyal, D. K., Thakur, A., Bhandari, A., & Paudel, U. R. (2023). Investigating Policyholders' Perception Towards Insurance: Evidence From Structural Equation Modeling. *Nepalese Journal of Insurance and Social Security*, *6*(1), 71-81.

Maharjan, P., Devkota, N., Mahapatra, S., Haq Padda, I. U., Dhakal, K., Mahato, S., ... & Bhattarai, U. (2022). FinTech Adoption among Online Grocery Buyers during COVID-19 Lockdowns in Nepal. *Journal of Private Enterprise*, *37*(2).

Moons, I., & De Pelsmacker, P. (2015). An extended decomposed theory of planned behaviour to predict the usage intention of the electric car: A multi-group comparison. *Sustainability (Switzerland)*, *7*(5), 6212–6245. https://doi.org/10.3390/su7056212

Muangmee, C., Dacko-Pikiewicz, Z., Meekaewkunchorn, N., Kassakorn, N., & Khalid, B. (2021). Green entrepreneurial orientation and green innovation in small and medium-sized enterprises (SMEs). *Social Sciences*, *10*(4), 1–15. https://doi.org/10.3390/socsci10040136

Naing, N. N. (2003). Determination of sample size. *The Malaysian Journal of Medical Sciences: MJMS*, *10*(2), 84–86. https://doi.org/10.5005/jp/books/11799_10

Nair, J., Chellasamy, A., & Singh, B. N. B. (2019). Readiness factors for information technology adoption in SMEs: testing an exploratory model in an Indian context. *Journal of Asia Business Studies*, *13*(4), 694–718. https://doi.org/10.1108/JABS-09-2018-0254

Nazir, M. A., & Khan, R. S. (2022). *Perspective from Pakistan. 9*(1), 20–46.

Onn, C., & Sorooshian, S. (2013). Mini Literature Analysis on Information Technology Definition. *Information & Knowlease …*, *3*(2), 139–141.

Perron, B. E., Taylor, H. O., Glass, J., & Margerum-Leys, J. (2010). Information and Communication Technologies in Social Work. *Advances in Social Work*, *11*(1), 67–81. https://doi.org/10.18060/241

Polas, M. R. H., Kabir, A. I., Sohel-uz-zaman, A. S., Karim, R., & Tabash, M. I. (2022). Blockchain Technology as a Game Changer for Green Innovation : Green Entrepreneurship as a Roadmap to Green Economic Sustainability in Peru. *J. Open Innov. Technol. Mark. Complex*, *8*(1), 1–19. https://doi.org/10.3390/ joitmc8020062

Pradhan, J. (2002). Information Technology in Nepal: What Role for the Government? *The Electronic Journal of Information Systems in Developing Countries*, *8*(1), 1–13. https://doi.org/10.1002/j.1681-4835.2002.tb00047.x

Rajbhandari, S., Devkota, N., Khanal, G., Mahato, S., & Paudel, U. R. (2022). Assessing the industrial readiness for adoption of industry 4.0 in Nepal: A structural equation model analysis. *Heliyon*, *8*(2).

Ratheeswari, K. (2018). Information Communication Technology in Education. *Journal of Applied and Advanced Research*, *3*, S45–S47. https://doi.org/10.21839/jaar.2018.v3is1.169

Sadiq, O., Hack-Polay, D., Fuller, T., & Rahman, M. (2022). Barriers to the Effective Integration of Developed ICT for SMEs in Rural NIGERIA. *Businesses*, *2*(4), 501–526. https://doi.org/10.3390/ businesses2040032

Sani, A., Nawaninatyas, P. N., Rizal, Khristiana, Y., Udin Zailani, A., & Husain, T. (2020). E-Business Adoption Models in Organizational Contexts on the TAM Extended Model: A Preliminary Assessment. *2020 8th International Conference on Cyber and IT Service Management, CITSM 2020*, 6–10. https://doi.org/10.1109/CITSM50537.2020.9268869

Shahadat, M. M. H., Nekmahmud, M., Ebrahimi, P., & Fekete-Farkas, M. (2023). Digital Technology Adoption in SMEs: What Technological, Environmental and Organizational Factors Influence SME's ICT Adoption in Emerging Countries? *Global Business Review, January.* https://doi.org/10.1177/09721509221137199

Shahadat, M. M. H., Nekmahmud, M., Ebrahimi, P., & Fekete-Farkas, M. (2023b). Digital Technology Adoption in SMEs: What Technological, Environmental and Organizational Factors Influence SME's ICT Adoption in Emerging Countries? *Global Business Review*, *January*. https://doi.org/10.1177/09721509221137199

Simmou, W., Govindan, K., Sameer, I., Hussainey, K., & Simmou, S. (2023). Doing good to be green and live clean ! - Linking corporate social responsibility strategy, green innovation, and environmental performance : Evidence from Maldivian and Moroccan small and medium-sized enterprises. *Journal of Cleaner Production*, *384*(1), 1–11. https://doi.org/10.1016/j.jclepro.2022.135265

Singh, M. P., Chakraborty, A., & Roy, M. (2018). Developing an extended theory of planned behavior model to explore circular economy readiness in manufacturing MSMEs, India. Resources, *Conservation and Recycling, 135,* 313–322. https://doi.org/10.1016/j.resconrec.2017.07.015

Singh, M. P., Chakraborty, A., & Roy, M. (2018). Developing an extended theory of planned behavior model to explore circular economy readiness in manufacturing SME's, India. *Resources, Conservation and Recycling*, *135*, 313–322. https://doi.org/10.1016/j.resconrec.2017.07.015

Siqueira, M. S. S., Nascimento, P. O., & Freire, A. P. (2022). Reporting Behaviour of People with Disabilities in relation to the Lack of Accessibility on Government Websites: Analysis in the light of the Theory of Planned Behaviour. *Disability, CBR and Inclusive Development*, *33*(1), 52–68. https://doi.org/10.47985/dcidj.475

Ssenyonga, M. (2021). Imperatives for post-COVID-19 recovery of Indonesia's education, labor, and SME's sectors. *Cogent Economics and Finance*, *9*(1). https://doi.org/10.1080/23322039.2021.1911439

Tommasetti, A., Singer, P., Troisi, O., & Maione, G. (2018). Extended Theory of Planned Behavior (ETPB): Investigating Customers' Perception of Restaurants' Sustainability by Testing a Structural Equation Model. *Sustainability, 10(*7), 1–21. https://doi.org/10.3390/su10072580

Torres, C. C. (2021). Adaptation and Validation of Technostress Creators and Technostress Inhibitors Inventories in a Spanish-Speaking Latin American Country. *Technology in Society*, *66*(June), 101660. https://doi.org/10.1016/j.techsoc.2021.101660

Tsai, M. T., Chen, K. S., & Chien, J. L. (2012). The factors impact of knowledge sharing intentions: The theory of reasoned action perspective. *Quality and Quantity*, *46*(5), 1479–1491. https://doi.org/10.1007/s11135-011-9462-9

Wang, B., Liu, Y., & Parker, S. K. (2020). How Does the Use of Information Communication Technology Affect Individuals? *Academy of Management Annals*.

Wendt, C., Adam, M., Benlian, A., & Kraus, S. (2022). Let's Connect to Keep the Distance: How SME's Leverage Information and Communication Technologies to Address the COVID-19 Crisis. *Information Systems Frontiers*, *24*(4), 1061–1079. https://doi.org/10.1007/s10796-021-10210-z

White, K., Habib, R., & Hardisty, D. J. (2019). How to SHIFT consumer behaviors to be more sustainable: A literature review and guiding framework. *Journal of Marketing*, *83*(3), 22–49. https://doi.org/10.1177/0022242919825649

Wilkinson, D., & Birmingham, P. (2003). *Using research instruments: A guide for researchers* (5th edition). Psychology Press.