Can ICT be Driving Force behind the Acceleration of Small and Medium Enterprise Profitability: Evidence from Nepal

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Abstract

Background: SMEs are critical to a country's economic development; researchers are increasingly focusing on their adoption and use of information and communication technology. Previous research has revealed that the contribution of ICT to SMEs performance and profitability is not clear or certain.

Objective: This study examines the adoption among SMEs in terms of the advanced stage from technology adoption to post-adoption. The mediating impact of performance on profitability is also being investigated.

Method: The exploratory research design was chosen as the primary study model in order to find reality. To examine the data quantitatively, descriptive and inferential statistics were used. A convenience sampling with a sample size of 201 SMEs were chosen for the study based on practical experience and adequate ICT knowledge.

Result: The study found that ICT usage and profit have a significant link. However, the performance of SMEs does not play a role in moderating the relationship between ICT usage and profitability because our study finds degree of utilization ICT usage doesn't play any significant role in performance.

Conclusion: ICT is still a new concept in SMEs that deserves to be given more attention. Employees and organizations must use ICT, technology system integration, and finally implementation across all functional areas to increase the profitability of SMEs. This study recommends that government should initiate ICT awareness programs in SMEs, provide subsidies and grants for ICT adaptation and use, education sectors should focus on technology skill manpower, and ICT should be used and integrated across all functional areas of SMEs to increase profit.

Paper Type: Research Paper

Key words: ICT, Small Medium Enterprise, Profitability, Performance

JEL Classification: M41, M15, C88, D91, N95, C38

Introduction

Today, information and communication technology (ICT) has become an integral part of human life. The introduction of various ICT devices, in particular, has helped businesses increase productivity and manage inter-organizational affairs. Customers may also use technology to perform more versatile and reliable personal communications, business transactions, and banking operations (Kraus et al., 2018). Firms that fail to embrace digital transformation to enable major business improvements such as improving customer experience and engagement, streamlining operations, and developing new business models will be destroyed by competitors who succeed (Fitzgerald et al., 2014).

The use of ICT has been explored in recent years by industries all over the world (Chen, 2021). Business enterprises' investment in ICT has also risen sharply: raising the legitimate question of whether increased ICT spending leads to enhanced organizational efficiency (Zhu and Kraemer, 2005; Tiwana, 2017). ICT has revolutionized business operations by enabling retailers to provide an infinite array of products and services to customers worldwide at any given time (Devkota et al., 2021). The effective use of information and communication technology is critical to an organization's long-term viability. Integrating ICT with front-office functionalities and back-end databases can result in unique ICT capabilities that are difficult to duplicate. The use of ICT (e-commerce) improves organizational efficiency (Bharadwaj & S, 2000; Zhu & Kraemer, 2002; Zhu et al., 2006; Yakasai, 2017). Another factor of ICT use that can be linked to firm success is 'ICT utilization' or whether the technology is used efficiently and effectively (Azam, 2014). Moreover, the growing popularity of the ICT as a tool for job searches has become advantageous for all job seekers (Maharjan et al., 2020). This ICT usage trend is particularly noticeable in developing countries. Many information systems in developing countries are underutilized, and as a result, they do not significantly improve the efficiency of the organizations that use them (Anandarajan, Igbaria, & Anakwe 2002; Azam, 2013). Proper ICT implementation can boost business efficiency, and integration can do the same (Forster & Cornford, 1992; Odedra, Lawrie, Bennett, & Goodman, 1993; Azam, 2014).

There is still a significant digital divide between developed and developing countries, and theories developed in the developed world might not be sufficient for addressing this. Developed countries have become ICT-dependent to perform various functions such as government, industry, education, and services (for individuals and organizations) through their high Internet penetration (Athapaththu & Nishantha, 2018). Developing countries grow significantly faster than developed countries in terms of Internet use between 2000 and 2013. This could pave the way for a more diverse use and utilization of ICT in developing countries (Ghimire et al., 2011). Country's technical infrastructure, government telecommunication policy, and the availability and pace of the Internet can all affect organizational ICT use. Facilitating conditions can play a significant role in ICT usage behavior (Zhu et al., 2004; Zhu, Kraemer, & Xu, 2006; Zhu et al., 2006; Pan, Yuan, et al., 2021). According to Molla & Licker (2005) aside from that, previous research studies have tended to favor the viewpoint that organizations implement technology that is useful and provides them with some economic benefit, whereas non-economic factors such as cultural and environmental factors, while significant, have been ignored (Thatcher et al., 2006).

In today's market-based global competitive climate, SMEs are crucial to a country's economic growth (Maharjan et al., 2024). Despite their economic importance, SMEs in developed countries have continued to contribute significantly to their country's development, while those in developing countries have not performed as well (Azam, 2007). The rapid expansion of information technology and its implementation in almost every field of economic operation has ignited a process enabling SMEs to use emerging technologies in the most cost-effective way possible in manufacturing, marketing, and networking (Azam, 2014). Online businesses have increased as a result of ICT advancements (Karki et al., 2021). As a result, it is thought to be worthwhile to study how SMEs can be tapped into

new opportunities and deliver improved results in economic growth (Kharel et al., 2022). Taking into account the notion of ICT's performance consequences, recent high ICT consumption growths in the developed world, and the economic value of SMEs, this study has chosen to investigate how ICT affects economic development in developing countries through improved of organizational performance and profitability. Thus, proper analysis is required to measure the contribution of ICT on SMEs business profitability. Therefore, this study aims to understand Contribution of ICT on SMEs performance and business profitability in Kathmandu valley.

This study adopts Diffusion of Innovation Theory, developed by E. M. Rogers in 1962, in order to measure the impact of ICT use on the profitability of SMEs through the lens of performance mediation. The results revealed that the impact of ICT integration on organizational performance was expected to be significant, as there is strong significant relationship between ICT integration, ICT usage along with firm's performance and profitability. Thus, it is expected that ICT usage would have a significant impact on organizational profitability, which support the theory. Despite its profitability, almost all (97%) Nepal's SMEs who use ICT based application, used across different functional areas, face several challenges – particularly, internet speed, connectivity, expert and resource availability, compatible legal and financial framework, and institutional support. Further part of this study includes: section 2 includes literature review followed by research method in section 3. Section 4 reveals findings of the study and section 5 concludes the study with recommendations.

Research Method

Theoretical Framework

Based on their focus, scope, and structures, the theoretical frameworks that address ICT diffusion can be divided into three groups. The DOI theory (Rogers, 1983), the TRA (Theory of reasoned action) (Fishbein & Ajzen, 1975), the TPB (Theory of planned behavior) (Ajzen, 1985), the TAM (Technology Acceptance Model) (Davis, 1986), and the (Unified Theory of Acceptance and Use of Technology) UTAUT (Venkatesh et al., 2003) are all based on prospective users' behavioral intention to adopt an innovation. These theories assume a positive relationship between users' perceptions of the innovation's characteristics and their intention to act. Perceived innovation characteristics in DOI theory (Rogers, 1983); attitude in TRA (Fishbein & Ajzen, 1975) and TPB (Ajzen, 1985); perceived utility and perceived ease of use in TAM (Davis, 1986); and perceived success expectancy and perceived effort expectancy in the UTAUT (Venkatesh et al., 2003) model reflect adopters' expectations about the innovation's characteristics. According to Rogers (1983), user intention is established during the persuasion stage of the diffusion process, where perceived innovation characteristics are important in explaining the intention. In general, innovation characteristics account for 49–87 percent of the variance in an innovation's acceptance. Rogers (1983) also claimed that the diffusion process begins at the awareness level, when adopters are introduced to an invention. Adopter demographics, risk-taking behavior, and inventiveness all play a role in an innovation's early adoption.

In comparison to the DOI theory, the TRA, TPB, TTF, SGM, TAM, and UTAUT demonstrate a similar systemic relationship between different internal and external influences, behavioral intention, and actual actions. The only antecedent of actual usage behavior, according to all four theoretical frameworks, is a behavioral intention. User expectations of an invention affect behavioral intention, which in turn explains real consumption (Azam, 2009). In the TRA and TPB frameworks, for example, the impact of attitude on actual behavior is mediated by behavioral intention. Similarly, the TAM and UTAUT models are intended to investigate the effects of perceived ease of use and usefulness (TAM) as well as performance and effort expectancy (UTAUT) on actual usage behavior as mediated by behavioral intention (Amatya et al., 2023 & Azam, 2007). Subjective norms and perceived behavioral control—the ability to perform a specific behavior—are included in the TPB. Subjective norms and facilitating

conditions—the availability of the necessary technological and human resources to implement a technological innovation—are combined with perceived performance expectancy, effort expectancy, and social influence in the UTAUT (Azam, 2013).

TOE system shows that there is a positive relationship between external and internal variables and organizational technology use conduct (Tornatzky & Fleischer, 1990; Cruz-Jesus et al., 2019). All external and internal antecedent factors are divided into three categories – technological context, organizational context, and environmental context. Technological context advocates that existing and emerging technologies that are important to the firm. Organizational context indicates the descriptive measures about the organization such as size and the number of slack resources available internally. Similarly, environmental context is the process by which an organization chooses, adopts, implements, and uses a technological innovation, as well as how it conducts business, responds to its industry, customers, and competitors, and interacts with government. According to DiMaggio & Powell (2000), TOE framework takes into accounts the organizational and technological contexts as well as environmental factors, but it is silent on the impact of perceived innovation characteristics. The effects of environmental factors on the process by which an organization adopts, uses, and implements an innovation are explained by institutional theory. However, they do not explain how these factors affect the formation of intention or entrepreneurs' perceptions.

A driving force behind incorporating organizational performance into technology diffusion studies is the belief that a satisfied user will return and become a loyal user. Users who are pleased with a product can also refer others who are interested in trying it out. The end result of innovation adoption, which is increased organizational performance in terms of profitability, has become a major focus of current IT research. The RBV argues that for a company, ICT usage is valuable, rare, imperfectly imitable, and imperfectly substitutable resources can generate long-term competitive advantages. Combining resources with organizational processes may make it unimpeachably imitable and substitutable. As a result, the use and extent of ICT in SMEs play a critical role in improving firm performance and profitability (Barney, 1991).

Conceptual Framework

The diffusion of ICT begins with SMEs desire to embrace the technology. As Rogers et al. (1983), "adoption of an innovation is a decision process in which an innovation moves through various states of adoption before being eventually adopted or having its use verified." That means adoption begins with the awareness stage, in which the adopter is first introduced to an innovation, and progresses through persuasion, decision, and confirmation phases. In the various stages of innovation acceptance, a number of variables play different roles. Rogers (1983) asserted that an adopter's personal characteristics, such as demographics, income, risk-taking behavior, and innovativeness, have a significant impact on the information level, which is critical for early adopters. A significant aspect that affects behavioral intention is 'cognitive assessment' of an innovation. The effect of cognitive assessment on behavioral intention is explained by the theory of reasoned action (TRA) (Fishbein & Ajzen, 1975) and the theory of expected behavior (TPB) (Ajzen, 1991). The TRA (Fishbein & Ajzen, 1975) and TPB (Ajzen, 1985) explain these forces as subjective norms, with a number of subsequent theoretical structures supporting this (such as UTAUT, Venkatesh et al., 2003). The role of family, peers, and peer groups becomes important in these theories since they focus on the individual adoption process. Similar variables that emerge from the presence of close associates of the companies, partners, and peer organizational groups often influence organizational adoption behavior (DiMaggio & Powell 1983; Kuan & Chau 2001; Teo et al., 2003), and they have a direct impact on organizational adoption intentions (Maiti & Bidinger, 1981)

Venkatesh and Bala (2008) established behavioral intention as a key factor in the diffusion of innovation. They made a distinction between purpose and expectation, arguing that intention is a reflection of the

adopter's internal schema of beliefs and therefore cannot anticipate circumstances that are not under the adopter's full volitional control. In contrast to intention, behavioral expectation is expected to be a better predictor of actual behavior, since it will take into account the effects of external socio-cultural variables. Behavioral expectation plays a significant role in predicting ICT use. Two aspects of ICT usage behavior are included in the model. The depth of ICT use is defined as the frequency or strength of use, while the breadth of ICT use is defined as strategic uses of ICT. The scope of ICT usage is further divided into two strategic variables: integration and utilization. Integration refers to how well ICT is integrated into different functional areas, while utilization refers to how efficiently ICT is used in the organization. The effect of ICT use, integration, and degree of utilization on organizational success and profitability is explained by the impact of ICT use, integration, and degree of utilization. SMEs performance plays a mediation role in ICT usage and profitability.

Hypothesis Formation

As per the conceptual framework, we have developed several hypotheses. They are discussed with their construct, items and researchers' argument on those issues.

Facilitating condition and Behavioral Expectation, ICT Usage: The technological context is concerned with existing and new technologies relevant to the firm, whereas the organizational context is concerned with descriptive measures of the organization such as its scope, size, and internal slack resources (Azam, 2007). These factors are especially important for the diffusion of information systems (IS) at the organizational level, as ICT requires some resources, such as technological and human resources, to operate. The presence of such resources may make technology adoption and use easier (Venkatesh et al., 2003). As a result of the foregoing discussion, it is hypothesized that:

> H_{01a}: *Facilitating condition has a significant influence on ICT usage*
>
> H_{01b}: *Facilitating condition has a significant influence on Behavioral Expectation*

Behavioral Expectation and ICT usage: Intention was found to be a strong predictor of actual usage behavior in the majority of innovation diffusion theories (Fishbein & Ajzen, 1975; Ajzen, 1985, 2020; Davis, 1986; Rogers, 1983; Venkatesh et al., 2003). Behavioral intention can explain the effects of various internal or external factors in predicting actual behavior as an immediate antecedent of actual innovation usage behavior.

There were no differences between intention and expectation in the field study. Furthermore, it demonstrated that a SMEs owner's desire to adopt a new technology was not merely a pipe dream, nor was it unattainable. The intention was formed by justifying the feeling by considering a variety of business and resource considerations. This study hypothesized that behavioral expectation is a possible predictor of actual ICT use based on previous literature (Venkatesh et al., 2008) and field study results. Thus,

> H_{02}: *Behavioral Expectation has a significant influence on ICT usage*
>
> H_{03}: *Behavioral Intention has a significant influence on ICT usage*

Owner innovativeness and Behavioral Intention, ICT usage: Adoption of a new product is a process that progresses through various stages over time. Furthermore, diffusion is defined as the process by which an innovation is communicated to members of a social system over time through specific channels (Kendall et al., 2001). The diffusion of innovation (DOI) theory (Rogers, 1983, 1995, 2003) states that the diffusion process begins with knowledge of the innovation's existence, and then progresses through persuasion, decision, implementation, and confirmation stages. According to Rogers (1995), the characteristics of the decision-maker, such as socio-economic characteristics, personality variables, and communication behaviors, play a critical role during the knowledge stage, which also serves as the foundation for intention formation. Although it is formed during the persuasion stage, an individual's innovativeness has a significant impact on the formation of adoption intention

for an innovation (Rogers, 2003). Rogers (1995) classified five types of adopters based on when they were born: innovators, early adopters, early majority, late majority, and laggards (Weber & Kauffman, 2011). As a result of the preceding discussion, it is hypothesized that:

H_{04a}: *Owner innovativeness has a significant influence on ICT usage*

H_{04b}: *Owner innovativeness has a significant influence on Behavioral Intention*

ICT usage and Degree of utilization, Integration, SMEs performance, SMEs profitability: Most theoretical frameworks involving IT innovation diffusion behavior include ICT use as the final dependent variable (Davis, 1986; Taylor & Todd, 1995; Venkatesh et al., 2003, 2008). ICT use has been used as the final dependent variable in previous studies with the assumption that ICT use would lead to improved performance. Different aspects of IS use, such as duration of use, frequency of use, and intensity of use, have been used by researchers to assess actual behavior in relation to any IT usage (Venkatesh et al., 2008). Despite the fact that a number of ICT innovation diffusion studies have focused on ICT use in recent years, ICT's impact on performance growth has become a critical issue in recent years. There is a direct and positive relationship between SMEs IT use and firm performance, according to the literature (Zhu et al., 2006; Zhu & Kraemer, 2005). According to Zhu et al. (2005), ICT integration has a positive and effective impact on organizational performance. As a result, the motivation for organizational ICT adoption or use is to integrate or properly utilize technology in order to improve performance and profitability. Based on the above discussion, it is hypothesized that:

H_{05a}: *ICT usage has a significant influence on Degree of utilization*

H_{05b}: *ICT usage has a significant influence on Integration*

H_{05c}: *ICT usage has a significant influence on SMEs Performance*

H_{05d}: *ICT usage has a significant influence on SMEs Profitability*

Integration and SMEs performance: The resource-based view (RBV), Barney (1991) emphasizes the importance of combining ICT resources to create unique IT capabilities that will improve organizational performance. How ICT is integrated and used across different functional areas determines IT capabilities. Integration (of the front-end functionalities of e-business) helps firms provide real-time product information to customers, provides customization capability, and facilitates self-service via online account management, according to Zhu and Kraemer (2002, 2005, and 2008). This improves transactional efficiencies and expands existing channels: ICT integration (back-end integration) also enables information sharing within the firm and along the value chain (Azam, 2008). Based on past studies,

H_{06}: *Integration has a significant influence on SMEs Performance*

Degree of Utilization and SMEs performance: Appropriate ICT usage, like ICT integration, can help organizations improve their ICT capabilities. As a result, according to the RBV, organizational performance is logically linked to ICT use. Many information systems in least developed countries (LDCs) are underutilized, according to previous studies, and thus do not contribute significantly to improving the performance of the organizations that use them (Forster & Cornford, 1992; Odedra et al., 1993). Based on the above discussion, it is thus hypothesized that:

H_{07}: *Degree of Utilization has a significant influence on SMEs Performance*

SMEs Performance and SMEs Profitability: The findings of Kumar & Gulati (2010) revealed that companies with higher technical efficiency were not always the most profitable. Any differences among industries (Bain, 1956; Porter,1985), firms (Penrose, 1959; Barney, 1991; Rumelt, 1991; Grant, 2002; Newbert, 2008), or strategic groups (Caves and Porter, 1977) can result in efficiency and profitability heterogeneity, which can be strategic beneficial with a positive effect on firm performance.

H_{08}: *SMEs Performance has a significant influence on SMEs Profitability*

SMEs Performance mediates the relationship between ICT usages and SMEs Profitability: Computers, scanners, printers, e-commerce software, and other ICT tools are used by organizations to gain a competitive advantage and improve organizational performance (Ainuddin et al., 2007). The number of ICTs has a big impact on how well people communicate (Bayo-Moriones, Billon, and Lera-Lopez, 2013). The authors also discovered that improved communication caused by ICT adoption leads to improved business performance, implying that communication and performance are intertwined.

H_{09}: SMEs Performance mediates the relationship between ICT usages and SMEs Profitability

In order to assess mentioned hypothesis, necessary variables (as presented in table 1) are chosen based on the study's objectives.

Table1: Variables and their definitions

Construct	Items	Observed Variables	Description
SMEs Profitability	PR1	Productivity	Overall Productivity is increased
	PR2	Net profit	Net Profit of the company has been increased
	PR3	Sales	Sales of the company have been increased
	PR4	Cost	Reduce the operation/ production cost of organization
Behavioral Intention	BI1	ICT useful	Find ICT useful in organization
	BI2	Accomplish task quickly	Technology enables to accomplish task more quickly
	BI3	Organization growth & development	Technology will increase chance of growing or development of the organization
SMEs Performance	PF1	Area/location	Sales area has been widened
	PF2	Interaction	Interaction with customers has been increased
	PF3	Competitive Position	Competitive position has been improved
	PF4	Transparent	The internal operation of the organization has become transparent and accuracy
Facilitating condition	FC3	ICT Resources	Necessary resources to used technology
	FC4	ICT Training and development	Appropriate training/development for employee to use ICT
	FC5	Continuous power supply	Continue power supply to effectively useICT
ICT Integration	IN3	Website	Website support information, product catalogue, customer customization and account management

Construct	Items	Observed Variables	Description
	IN4	Web application	Web application are electronically integrated with back-office system and data base
	IN5	Data base	Company data base are electronically integrated with suppliers and Partners
Behavioral expectation/ Plans	BE3	Online order receiving & processing	Interactive homepage which supports product catalog and order processing
	BE4	E-commerce	Interactive homepage which supports online transaction
	BE5	ERP/ Digitalization	Complete digital transaction within and outside of organization
Degree of Utilization	DU5	CRM Function	ICT Properly utilized to CRM function
	DU6	Suppliers Relationship Function	ICT Properly utilized to Suppliers Relationship Function
	DU7	SCM function	ICT Properly utilized to SCM function
Owner Innovativeness	OI3	Innovate New Things	Love to innovate new thing
	OI4	Adopt Modern Technology	Want to adopt modern technology
	OI5	Flexible with change	Flexible with changing environment
ICT Use	ICT3	E-commerce	Online order receiving and processing
	ICT4	E-Business	Interactive homepage which supports online transaction and accountant management
	ICT5	ERP	Complete digital transaction within and outside of organization

Notes: Some of the items including PR5, PR6 and PR7 from construct 1; BI4, BI5, BI6 and BI7 from construct 2; PF5 and PF6 from construct 3; FC1, FC2 and FC6 from construct 4; IN1 and IN2 from construct 5; BE1 and BE2 from construct 6; DU1, DU2, DU3, DU4 and DU8 from construct 7; OI1 and OI2 from construct 8 and ICT1 and ICT2 from construct 9 were dropped after performing confirmatory and Explanatory factor analysis as these items value remains below 0.5.

Study Area, Population, and Data

To find the causal effect relation in the study explanatory research design was used. Kathmandu valley is the study area chosen for the research which is located in province 3 of Nepal. The study area is the central part of the country as well as the capital city of Nepal with the population of around 1 million people. Being the capital city of Nepal and one of the regions which accumulates highest concentration

of population and center for different major industries, conducting research on contribution of ICT on SMEs business performance and profitability in Kathmandu valley would give better and more factual results (Sharma et al., 2020). Convenience sampling for the research was used as they are frequently and easily available. The data for this study was collected from small and medium-sized businesses, and the sample size was 201. The sample size was determined from the formula; n= z2pq/l2 (Singh & Masuku, 2014, Bhandari et al., 2021, Devkota et al., 2022). The researcher calculated a sample size of 280, but due to Covid-19 cases and the lockdown in Kathmandu Valley, he was unable to collect all 280 samples. As a result, the researcher will be able to collect 201 samples.

A structured questionnaire has been developed and devised to conduct survey on contribution of ICT on SMEs business performance and profitability in Kathmandu valley for data collection. Interview was conducted among the managers of Kathmandu valley and Quantitative data was extracted through interview. Primary data from questionnaire survey have been collected. The researchers have linked questionnaire in order to meet the various objectives mentioned above in the study. The formulated structured questionnaires are maintained in kobo toolbox for data collection then data collection permission was taken from the Administration of Patan Industrial Estate where a letter was signed from the authority as well as Kathmandu valley. Data was collected from the month of April 2021 to July 2021.

To analyze the data, both descriptive and inferential analysis were performed. In descriptive analysis, the objective wise answers according to the respondents are presented. And in inferential analysis, the analysis is done by using the SEM. We applied SPSS (version 21) and SPSS AMOS (version 23) to perform measurement values of the data. We also perform Gaskination's StatWiki for validation of our result, and SOBEL test calculator for the mediation analysis. Only the final and robust dataset are performed and presented in data analysis.

Data Analysis and Results

Socio-Demographic Characteristics

For this study, data was collected from 201 SMEs within Kathmandu valley. In this study, majority of the respondents (73%) are male whereas a minority of the respondents (27%) is female (See table 2), which is similar to the Razzaque et al. (2020) who observed 69 percent males and 31 percent females among 374 respondents. This demonstrates that males use ICT technology in greater numbers than females. Males are more drawn to developing confidence with ICT than females, who develop anxiety, low interest, and negative attitudes toward ICT issues (Choo & Teh, 2019). Age is significant because of its linkage with individual and personal accumulated knowledge. Age of the employee shows that it is associated with attitudinal and behavioral differences. Our findings show that only 24% respondents are over the age of 50. Choo & Teh (2019) also found that the younger generation, aged 45 and under, is more interested in adopting ICT than the older generation. Dapp (2014) discovered that over 55 million people over the age of 14 go online on a regular basis, and that this number includes people of all ages. According to Micu (2016), more than a quarter of people aged 25 to 34 uses ICT. It is indicative from our respondent group as well.

Table 2: Socio-demographic status

	Number	In Percentage
Gender		
Male	146	73%
Female	55	27%

	Number	In Percentage
Age (in years)		
Below 30	30	14.9%
31-40	64	31.8%
41-50	58	28.8%
Above 50	49	24.4%
Education Level		
Below Secondary	2	0.01%
Secondary	25	12.4%
Higher Secondary	25	12.4%
Bachelor's Degree	115	57.2%
Master's & above	34	16.9%
Business Classification		
Small	145	72%
Medium	56	28%

Considering the educational background, all the respondents are educated, and majority (57.21%) had earned a bachelor's degree. Nyamwanza (2014) also observed that 60% of their respondents have completed bachelor degree who are using ICT like Accounting Software, financial software etc. Education level of the employees plays a significant role in execution and implementation of ICT on SMEs in an organization. The study also found that majority of SMEs respondents (67%) are business owners, while the minority of SMEs respondents (33%) is SMEs employees – such as Management team members (16.67%), Quality Managers (4.55%), Supervisors (19.70%), Employees (7.85%), Accountants (25.76%), and General Managers (25.76%). In terms of their scale of business, the majority (72%) fall into the medium scale business category.

General Awareness about Information Communication Technology

The Government of Nepal has classified industries into seven categories like Agriculture and forest-based Construction, Manufacturing, and Mining, Services, Tourism, Information Transmission and Communication and others. Manufacturing, Agriculture and Forestry, Construction, Trading, and Service were the only industries in our study area. In our study area, there were 109 manufacturing, 4 agriculture and forest-based, 11 construction, 39 services, 36 trading, and 2 other industries. Result shows that 62.2% respondents opined that business competition positions are favorable. Competition and competitiveness are phrases that are widely used in both business and public discourse to describe economic units, their environments, and their capacity to perform in accordance with strategic or policy goals drawn from corporate, economic, or social objectives (Listra, 2015).

Figure 1: Sales, revenue and profit for last 5 years
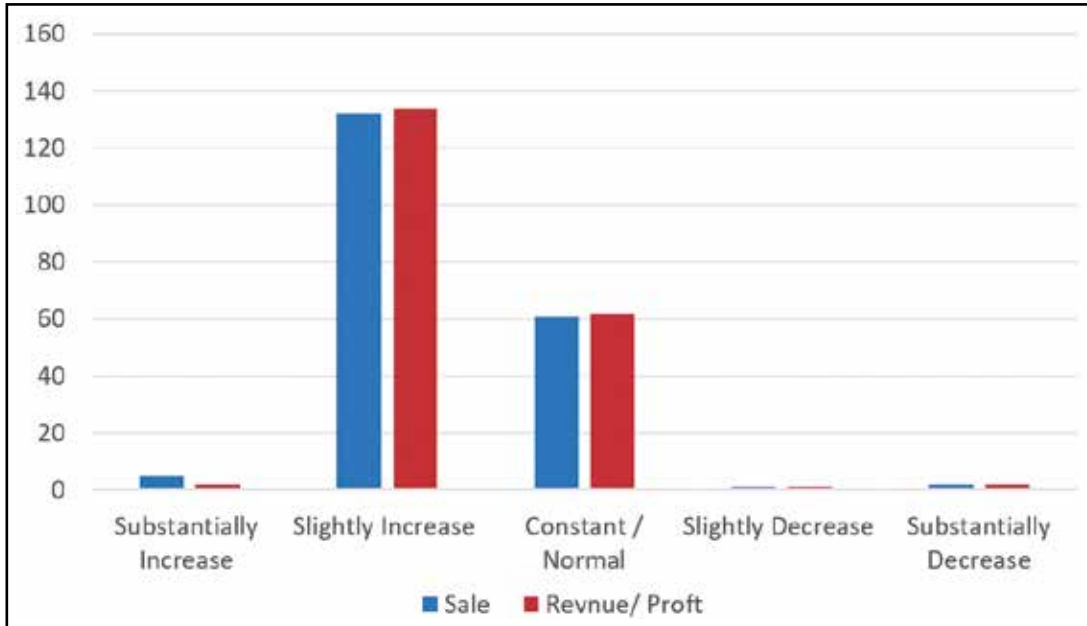
The figure 1 indicates that both sales and revenues/ profit has slightly increased by 65.7% and 66.67% respectively in last 5 years. While, rest 30% mentioned that their sales and revenue have normal increase in the period. Both the statistical estimation indicates increment in sales as well as profit of the SMEs. It is also found that the majority of the respondents (59%) receive government privileges/ benefits as SMEs. Such privileges received are subsidies (75.42%), Soft loan (14.41%), liberal policy (9.32%) and Tax discount (0.85%). We pose question to the respondents that whether they received such privilege/ benefits for development of ICT for their business. 79% respondents deny the fact, only 21% agreed upon it. Even among those 21% respondents, 62% of SMEs received such grants only once, 17% received grants/subsidies annually, 9% received semi-annually, 7% received quarterly, and 5 percent received such grants/subsidies monthly.

Respondents were asking to indicate the level of ICT they are currently using in their organization. Result indicates that 100% respondents have basic computer skilled, followed by internet with own static home page (94%). Also, above half (57.7%) of the respondents do online order received and processing, and 45.2% perform e-business. Despite of this indication, only 9.4% SMEs have ERP/ digitalization. Result also found that all of the SMEs uses varieties of software packages. 90.5% SMEs have used finance/accounting, while E-commerce, SCM Software, Inventory Management Software, CRM software are used by 63.9%, 24.4%, and 5.9% respectively. The result indicates that the ICTs in SMEs are still underutilized or not fully utilized.

Challenges and Managerial Solution

The study shows that out of 201 samples, the majority of the SMEs respondents i.e. (97 percentage) say that there is a challenge of adopting ICT whereas 3% of minority of the SMEs respondents state that there is no such challenges. Among the respondents, 97% opined that there are challenges for adopting ICT on SMEs where the challenges are unskilled manpower (96%), lack of ICT infrastructure (88.1%), resistance of technology (75.6%), lack of awareness (60.2%), lack of knowledge (45.8%), lack of money/capital (41.8%), and lack of government support (41.3%). Whereas minority respondent (i.e., 8.5%) mentioned that information security/data protection are the challenges. According to a study

conducted by Rahman et al. (2015) of South Asian firms, a lack of infrastructure and environment is a major barrier. Respondents were further asked, from whom such challenges are created? They opined that most of the challenges are created by management/owner (41%) and employee/staff (43%), government (14%) and other factors (2%).

Respondents were also asked whether the challenges of adopting ICT managerial? 96% of them agree that the ICT challenge can be handled. They suggest several ideas (as shown in figure 2) that can be done for the betterment of easy adoption of ICT in business sectors. It is observed that government and organization should focus on ICT awareness program for the betterment of and easy adaptation of ICT on Small medium enterprises.

Figure 2: Managerial solution for ICT adoptation
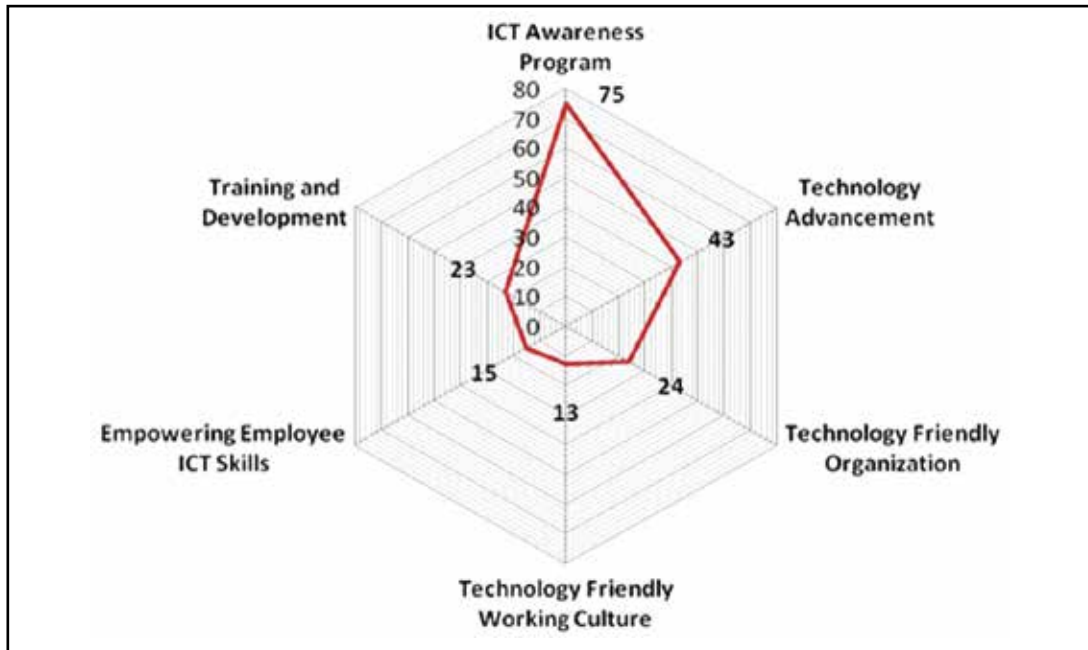
Source: Field Study

Inferential Analysis

Summary Statistics: The observation was collected from 201 respondent from the Kathmandu valley with no missing of observation. From the collected information, Mean, Standard Deviation, Skewness and Kurtosis are observed for the nine-construct undertaken for this study. As Karla (2019) the range of Skewness and Kurtosis should lie in between -3 to +3, and -10 to +10 respectively in order to have normality of data. Our result indicates that this range meets the condition of our dataset. Hence, the data is Normandy distributed.

Confirmatory factor analysis (CFA): Confirmatory factor analysis (CFA) is used to test how well the measured variables represent the number of construct (Costa & Sarmento, 2019). For the goodness of fit of dataset, the obtained value of CMN/DF, RMR, RMSEA, GFI, IFT, TLI and CFI should measure with the model value of; < 5, <0.08, >0.80, >0.90, >0.90, >0.90, <0.08 respectively (See table 3). The obtained values of the measures are fit within the model value, means, the model is perfectly fit the goodness model in SEM.

Table 3: Statistics of goodness of fit used in SEM

Fit indicates	Critical Value	Obtained Value	Decision for model fit
(CMIN/DF)	<3 excellent (<5 permissible)	2.202	Excellent
RMR	<0.08	0.030	Excellent
GFI	>0.90 (>0.80)	0.808	Excellent
CFI	>0.95 (>0.90)	0.924	Excellent
TLI	>0.95 (>0.90)	0.910	Excellent
IFI	>0.95 (>0.90)	0.925	Excellent
RMSEA	<0.08	0.078	Acceptable

Note: critical values in parenthesis are acceptable value.

Exploratory Factor Analysis (EFA): EFA's is performed to discover the number of common variables influencing a series of measures as well as the strength of the relationship between each factor and each observed measure (Marjorie et al., 2003). In this study, EFA is performed in order to identify reliability of the dataset. Reliability of the dataset must perform in order to estimate the errors in measurement. The value of KMO and Bartlett's test were performed to see the adequacy of the correlation. As our result indicates the KMO Value is 0.716. It means that the data are correlated and shows the good relationship of the data. We also perform common method bias test. We perform Harman's single factor test to find the biases formed on the data, and found 17.43%. As (Fuller et al., 2016) the cumulative percentage of single factor must be less than 50% to avoid biasness, this issue is no more in our dataset. Hence, we do not need to have concern on biasness.

Measurement Model: In the measurement mode, we present factor loading, Cronbach alpha, CR, AVE and MSV. Measurement model works on measure the reliability and validity of the dataset. Studies (Nath & Goel, 2016) suggest to check convergent and discriminatory validity in order to deal with the biases on data. Here, the basis for convergent validity is; AVE>0.5, CR >0.7, the values from the table for each construct are obtained as per the basis (See table 4). Our result shows minimum value of CR is 0.846 and AVE is 0.637 which are greater than the threshold values provided in the literature. Hence, the dataset has no convergent validity issue. Similarly, the basis for discriminatory validity is AVE>MSV and √AVE>R. Here too, result indicates that both conditions fulfilled (see table 5). Besides, we also checked Cronbach Alpha which indicated each construct value is greater than 0.844, which indicates the dataset has no validity concerned. So, we assured that our dataset is reliable and valid.

Table 4: Item loading, composite reliability and average variance explained

Construct	Indicator	Factor Loading	Cronbach Alpha	CR	AVE	MSV
SME's Profitability	PR1	.941	0.892	0.91	0.723	0.067
	PR2	.938				
	PR3	.894				
	PR4	.674				
Behavioral Intention	BI1	.978	0.987	0.987	0.963	0.03
	BI2	.972				
	BI3	.964				

Construct	Indicator	Factor Loading	Cronbach Alpha	CR	AVE	MSV
SME's Performance	PF1	.866	0.872	0.873	0.637	0.054
	PF2	.886				
	PF3	.852				
	PF4	.767				
Facilitation Condition	FC3	.940	0.958	0.958	0.885	0.123
	FC4	.941				
	FC5	.938				
Integration	IN3	.919	0.936	0.936	0.831	0.158
	IN4	.915				
	IN5	.915				
Behavioral Expectation	BE3	.939	0.942	0.944	0.849	0.944
	BE4	.917				
	BE5	.928				
Degree of Utilization	DU5	.857	0.875	0.876	0.702	0.158
	DU6	.866				
	DU7	.823				
Owner Innovation	OI3	.825	0.870	0.876	0.706	0.04
	OI4	.898				
	OI5	.909				
ICT Usage	ICT3	.868	0.844	0.846	0.649	0.067
	ICT4	.873				
	ICT5	.827				

Table 5: Result of discriminant validity (Fornel-larcker method)

	PF	FC	BE	BI	OI	ICT	DU	IN	PR
PF	**0.798**								
FC	0.114	**0.941**							
BE	0.069	-0.15	**0.921**						
BI	-0.03	-0.17	0.069	**0.981**					
OI	0.201	-0.02	0.09	-0.124	**0.84**				
ICT	0.053	0.237	0.111	-0.12	0.004	**0.805**			
DU	0.099	0.35	-0.29	-0.162	0.199	0.125	**0.838**		
IN	0.232	0.092	-0.13	-0.162	0.177	-0.03	0.398	**0.912**	
PR	0.016	-0.07	0.157	-0.138	0.057	0.259	-0.02	0.117	**0.85**

Path Analysis and Test of Hypothesis: Hypothesis is a specific preliminary supposition or assumption used in framing theories or planning experiments proposed to be given a direct experimental test when possible (Nath & Goel, 2016). Dahiru (2008), the p-value must be less than 0.10 to have the significant relationship between the variables. Result shown that H01a, H01b, H04b, H05d, H06 have the significant relationship between the variables and remaining have the insignificant relationship. Those hypotheses having the significant relationship are accepted and remaining others are rejected (see table 6).

Table 6: Result of structural path model of direct effects

S.N.	Hypothesis	P-value ($p<0.10$)	Remarks
H_{01a}	Facilitating condition → ICT usage	0.003	Supported
H_{01b}	Facilitating condition → Behavioral Expectation	0.052	Supported
H_{02}	Behavioral Expectation → ICT usage	0.152	Not-supported
H_{03}	Behavioral Intention → ICT usage	.115	Not-supported
H_{04a}	Owner innovativeness → ICT usage	.962	Not-supported
H_{04b}	Owner innovativeness → Behavioral Intention	0.093	Supported
H_{05a}	ICT usage → Degree of utilization	.123	Not-supported
H_{05b}	ICT usage → Integration	.710	Not-supported
H_{05c}	ICT usage → SMEs Performance	.500	Not-supported
H_{05d}	ICT usage → SMEs Profitability	***	Supported
H_{06}	Integration → SMEs Performance	.003	Supported
H_{07}	Degree of Utilization → SMEs Performance	.210	Not-supported
H_{08}	SMEs Performance → SMEs Profitability	.687	Not-supported

Mediation Analysis: In order to perform mediation analysis, SOBEL test is done to find whether the mediating variables significantly affect two variables i.e., ICT (Information Communication Technology Usage) and PR (Profitability) by PF (Performance) which is mediating variable for the study. Result indicates that Performance doesn't play any mediating role between ICT usages and profitability (a = 0.013, b = 0.0257 and p-value = 0.5168). This indicates that there was no indirect relationship.

Discussion

The estimation revealed a significant relationship between facilitating condition and expectation, which was consistent with previous research studies (Venkatesh et al., 2008; Ajzen, 1985; Taylor & Todd, 1995; Thompson et al., 1991) in the field study. The operationalization of the construct facilitating condition, external resources such as organizational, technological, and human resources were highlighted. The facilitating condition was defined as an individual's belief that an organizational and technical infrastructure existed to support the use of the system. The findings revealed that SMEs with the necessary technical and organizational resources (e.g., hardware and Internet connectivity, ICT-competent employees, compatible procedures, etc.) had high expectations of implementing ICT.

The impact of ICT integration on organizational performance was expected to be significant. A strong significant relationship between ICT integration and firm performance was discovered using structural

model estimation. This result was in line with the findings of the field study and previous research (Zhu & Kraemer, 2002, 2005). It was expected that ICT usage would have a significant impact on organizational profitability. Using structural model estimation, a strong significant relationship between ICT usage and firm profitability was discovered. The findings of the field study and previous research backed up this conclusion (Zhu & Kraemer, 2002, 2005). To evaluate financial performance as manifest variables, higher-order hierarchical analysis was used.

However, the way ICT was used across different functional areas had a significant impact on overall firm profitability. The majority of SMES respondents (97%) say there is a challenge in adopting ICT, while only 3% of the minorities of SMEs respondents say there are no such challenges. Unskilled manpower is the main challenge, according to 96 percent of respondents. Management/owner and employee/ staff are responsible for the majority of the issues. Majority of respondents believe the ICT challenge can be overcome; only 4% disagree. The majority of SMEs (39%) focus on ICT awareness programs as a solution for ICT adoption. Beside this, Nepal's SMEs that use ICT-based applications face a variety of challenges, including a lack of Internet speed, connectivity, expert and resource availability, a compatible legal and financial framework, institutional support, and so on. The government might develop adequate technological, legal, and financial infrastructure, as well as laws and incentives to encourage various stakeholders and SME owners to ensure a well-integrated and appropriately utilized ICT operational environment.

Conclusion and Recommendations

A study in the Kathmandu valley looked at the impact of ICT use on the profitability of small and medium-sized enterprises (SMEs) through the lens of performance mediation. The analysis was based on the assumption that SMEs that use ICT improve their overall performance and profits. According to the findings of the study, lack of funds/capital, lack of awareness and resistance to technology are some of the barriers to ICT adoption in SMEs. Management/owner and employee/staff are responsible for the majority of the issues. Majority of respondents (96%) believe the ICT challenge can be overcome. Our model revealed a link between the use of ICT and the profitability of SMEs. The variable has a significant P-value ($p<0.05$), indicating that ICT use is associated with SMEs' profitability. Similarly, the facilitating condition has a significant impact on ICT use. The facilitating circumstance has a significant impact on behavioral anticipation. The level of creativity possessed by a business owner has a significant impact on behavioral intent. Because there is no mediation relationship between ICT usage and profitability, SME profitability is unaffected by their performance. Despite its advantages, Nepal's SMEs that use ICT-based applications face a variety of challenges, including a lack of Internet speed, connectivity, expert and resource availability, a compatible legal and financial framework, institutional support.

Based on the findings, the researcher suggests the following suggestions as a recipe for effective ICT implementation on SME business profitability. These suggestions are also made to gain a better understanding of ICT usage and SME profitability, as well as SME contribution to economic development in developing countries like Nepal. They are:

- **Provide Subsidy and Grants for ICT Adaptation and Usage:** 79 percent of people do not receive government grants or subsidies for ICT development, implying that ICT is underutilized or inefficient in Nepal. It will not develop unless and until the government fully supports or participates in its use and adoption. As a result, the government should provide subsidies and grants to those who wish to use information and communication technology.

- **Small and Medium Organization should use ICT in all Functional (Department) Area:** ICT usage has a significant impact on SME profitability. As a result, SMEs must incorporate ICT into all aspects of their operations in order to increase profitability, with a higher degree of utilization and integration of all functional areas working in a single platform or system.

- **SMEs must Facilitate ICT:** In other part, facilitating conditions have a significant impact on ICT usage, and organizations should pay special attention to them in order to increase ICT usage. Since ICT usage has significant relationships with SMEs' profitability, SMEs should use it to maximize their profits.

- **Education Sectors should focus on Technology Skill Manpower:** Result found that in 97 percent of cases, SMEs believe that implementing ICT into practice is difficult. Lack of funds/capital, awareness, knowledge, and technology resistance are just a few of the obstacles. The main challenge, according to 96 percent of respondents in a research firm survey, is finding skilled workers, so researcher would suggest education sectors to supply technology skill manpower.

- **Promoting ICT Awareness Program:** It is also found that the majority of SMEs (39%) look to ICT awareness programs as a way to increase ICT adoption. The majority of respondents (96%) believe that the ICT challenge can be overcome, while only 4% disagree. As a result, the government and organizations must promote awareness about ICT usage and adaptation by SMEs.

Despite the fact that this study makes a significant contribution by examining SMEs ICT use (from a developing country perspective) and analyzing the effects of a variety of variables on ICT implementation and adoption, as well as the significance for organizational performance and profitability one of the shortcoming of the study is that it does not clearly clarify how the first-order or manifest variables (the variables that make up a higher-order hybrid variable) affect ICT use and business outcomes. Furthermore, the large industry was excluded from the study's scope, which could be seen as a limitation in drawing broad conclusions for ICT use and profitability. This research relied on cross-sectional data gathered at a specific point in time. As a result, it was unable to examine the impact of antecedent factors on ICT dissemination and its role in explaining SMEs success over time. These limitations of this study may point the way for further research on SMEs development and usage of ICT in Nepal.

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