

Determinant Factors of E-commerce Adoption by SMEs in Nepal

Pratikshya Tamang ¹ Sarana Photchanachan ²

Abstract

The purposes of this paper were to study the e-commerce environment within the SMEs sector in Nepal and to analyze the influence of each factor on adoption of e-commerce among SMEs. This research is mono methodology based (quantitative) where the researcher shall use survey questionnaire that will be asked to be completed or filled-out by company owners/managers. 95 percent confidence level for the equation, the required sample is calculated to be 400. The respondents are small and medium company owners, entrepreneurs, managers or CFOs in Kathmandu. As the quantitative method is being used to collect primary data, they will be calculated using SPSS software. The findings indicated that this analysis demonstrates that the size of the business, the involvement and innovativeness of the owner or manager, pressure from customers or suppliers, and technological readiness significantly influence e-commerce adoption among SMEs. These factors are crucial indicators that affect the decision-making of SMEs regarding whether or not to adopt e-commerce in their operations. Understanding these factors and applying them in strategic planning for e-commerce is essential for SMEs in Nepal. Being technologically prepared, fostering executive engagement, and responding to the needs and expectations of customers and suppliers are key factors that can help SMEs effectively embrace and succeed with e-commerce.

Keywords: E-Commerce Adoption

Introduction

It has been seen that all over the world these days SMEs are playing an important role in the national economic development. SMEs are becoming more and more subject of attention in the developing, emerging and developed economies countries. Especially in market economies, SMEs are the engine of economic development. The private sector and in particular SMEs form the backbone of market economy and for transaction economies in the long-term provide most of the employment. Empirical evidences have shown that the SMEs contribute a larger

¹ Ph.D, Management, School of Management, Shinawatra University E-Mail: pratikshyat868@gmail.com

² Dr. Ph.D, Dean, School of Management, Shinawatra University

portion of job creation than larger business (Wit & Kok, 2014) and they also have the highest sales growth and employment growth (Ayyagari et al., 2011). So it isn't surprising that K.C., S. K. and Timalsina, A.K. (2016) recognized them as a driver of economic growth and innovation. In developing countries, SMEs are becoming considerable interest mainly for two reasons: SMEs being an effective anti-poverty programmed and they are building blocks of innovation and sustainable growth. SMEs produce creativity and innovation that fuels economic progress, promote stability, competition and high-value added products. They are the starting point of industrialization and extra growth over the past several years through-out the industrialized nations has been possible due to large growth of SMEs. The case of high-tech companies in the Silicon Valley in the US shows that these companies were established as venture firms by engineers and researchers and later they have become big businesses in only few years.

In the early years E-commerce was considered to be an aid to businesses and in this 'technological era' it has become businesses' enabler. OECD (2000) mentioned SMEs can widely benefit from E-commerce as it reduces cost, helps to expand market potential and provide new business opportunities. Its application has now transformed from physical presence to over the internet. E-commerce has brought changes in retail and service industries. Today, customers can purchase goods from their homes or work spaces. Since one of the main objectives of SMEs is to take advantage of development opportunities in foreign international markets, an e-commerce strategy is essential to develop for short and long-term gains. E-commerce is still considered a new idea for SMEs, consumers and government especially in the developing world.

In the past many studies had been done on e-commerce and its adoption but these studies mainly focused on developed nations. Few researches have been conducted regarding e-commerce adoption by SMEs in emerging and developing nations. These researches concentrated mainly on the adoption from an individual however there has been only small handful of study conducted in context to Nepal. Till this date the e-commerce sector is facing the same issues as that was in the past such as online payment system, lack of knowledge, awareness, IT adoption, etc. therefore, they should be addressed and better measures are ought to be implemented for the future growth and advances in e-commerce in Nepal. Of the total population only 60% Nepalese are connected to the internet (Nepal Telecommunications Authority, 2019). E-commerce has dramatically increased in the past few years, social media sites such as Facebook, Instagram, and many others platform are also supporting such business. In Nepal such foreign platform is most in use for e-commerce rather than owing own webpage. This research aims to focus on the e-commerce usage pattern of the firms, the main factor or factors that influence

the adoption of e-commerce by Nepalese SMEs and adoption model for future growth of firm's businesses

Research's objective

1. To study the e-commerce environment within the SMEs sector in Nepal.
2. To analyze the influence of each factor on adoption of e-commerce among SMEs.

Hypothesis

1. H1: There is significant relationship between organizational factors and e-commerce adoption.
2. H2: There is a significant relationship between technological factors and e-commerce adoption.
3. H3: There is a significant relationship between environmental factors and e-commerce adoption.
4. H4: There is a significant relationship between individual factors and e-commerce adoption.

Conceptual framework

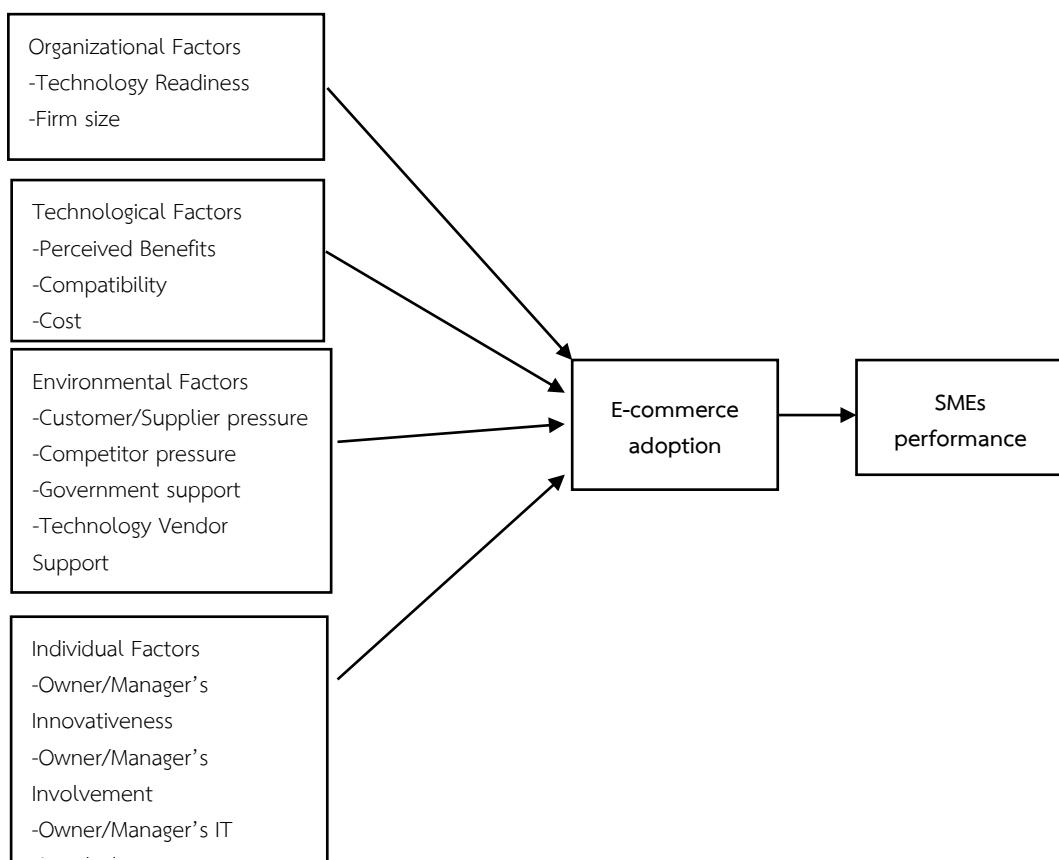


Figure 1 Conceptual Framework

Literature review

E-commerce adoption factors can be described as those that motivate or inhibit the adoption of e-commerce. In this section four factors that are considered to influence the SMEs in Nepal in adoption of e-commerce are briefly explained.

Organizational Factors

The organizational factors represent the internal factors of an organization that influence the adoption of innovation (Tornatzky & Fleischner, 1990). It is also known as firm internal factors are generally represented by size, quality of IS system, management support and enterprise resources (Rashid & Al-Qirim, 2001). Technology readiness and firm size has been identified as the determinant parts of organizational factors.

1. Technology Readiness

Technological readiness is defined as the extent to which the technology infrastructure, relevant system and technical skills in business which can support e-commerce adoption (Zhu et al., 2002). Technology readiness consists of technology infrastructure and IT human resources (Zhu & Kraemer, 2005) and both are really needed if the company wants to make e-business an integral part of the value chain (Tiago & Maria, 2010). However, the OCED (2017) report confirms that the situation of costs of adopting and implementing ICT resources and upgrading e-commerce network systems in many organizations is not very satisfactory in many developing economies. It is also clear that the high cost of ICT infrastructure in many developing economies does not allow small and medium-sized enterprises to adopt new technologies and influence the growth of e-commerce (Ghobakhloo & Tang, 2013).

2. Firm Size

Firm size is considered as a determinant element in adoption of IT innovation by business (Morteza et al., 2011). Firm size is relatable to both human and financial resources. The larger the size of business means the greater its ability to provide certain resources and more likely to adopt e-commerce technology. Hachimi et al. (2017) confirmed that the size and structure of the organization were the most frequently considered factors in the previous e-commerce adoption studies. However, no online payment environment or institute contributes to the construction of transitional integrity and consequently the development of the e-commerce and the payment system in most developing economies (Oxley & Yeung, 2001). Thong (1999) and Al-Qirim (2005) found that the larger SMEs tended to adopt more sophisticated IS/ e-commerce technology than the smaller ones. Moreover, Johnson (2010) revealed that small businesses usually have a limited budget and therefore they are less likely to invest a large amount of their budget for IT investment.

Technological Factors

The technological factors refer to the adoption of innovation using different ICT equipment and other related network technologies within the environment of organizations (Teo et al., 2004). Therefore, technological factors signify the technologies available within organizations and how technological contextual factors affect the adoption of technologies in organizations (Chand, S., & Kumar, B.A., 2017). According to Tornatzky, L., and Fleischer, M. (1990) the technology context describes not only existing technology available within an organization but also new technology available in the market which determines the ability of organization to move to new technology or other technologies initiatives. In this study, perceived benefit, compatibility and cost will be considered as several previous studies have found that these aspects were significant determinants in e-commerce adoption (Duan et al., 2012).

1. Perceived Benefits

Perceived benefits are defined as a set of anticipated advantages that innovation can provide the organization (Seyal et.al, 2004). They refer to the degree of acceptance of the possible advantages that e-commerce technology can provide for the organization (Tiago & Maria, 2010). In classical innovation literature, perceived benefits are referred to as “relative advantages” (Gibbs & Kraemer, 2004). Greater managerial understanding of the relative advantages of e-commerce adoption raises the probabilities to allocate some resources, such as managerial resources, financial resources and technological resources, in adoption of e-commerce technology (Tiago & Maria, 2010). Conversely, the lack of understanding by the owner/managers about the benefits of e-commerce made them hesitant and reluctant to adopt e-commerce (Kapurubandara & Lawson, 2006). Duan et al. (2012) mentioned that an organization will adopt technology if they perceived that the technology needed will overcome a perceived performance gap or enable a business opportunity.

2. Compatibility

Compatibility refers to what extent e-commerce is compatible with the technology infrastructure, culture, value, and work practices that already exist in the firm (Morteza et al., 2011). Any organization easily is willing to accept an innovation if it can synchronize with the prevailing values of the organization, meet the needs of the organization and is in accordance with organization culture. Compatibility between organization policies and technology innovation will make the innovation easier to be pictured in a more familiar context (Rogers, 2003). The compatibility is also associated to a preceding idea and this compatibility can either speed up or slow down the adoption of innovation by organization (Alam et al., 2011).

3. Cost

Adopting e-commerce technology in an organization requires some technology infrastructures, such as hardware, software, internet network and IT personnel. As commonly known, those infrastructures are quite expensive for organizations, especially for small business. The cost spend for certain technology will affect the speed of adoption and implementation. The less the cost spend on a certain technology, the more likely it will be quickly adopted and implemented in an organization (Premkumar & Roberts, 1999) and (Tornatzky & Klein, 1982). Although mentioned by Palvia, et al. (1994) that the prices of hardware and software have decreased rapidly due to the emergence of powerful personal computers and the availability of software packages which are user friendly and ready to use, however, that cost remains an obstacle for SMEs in adopting certain technologies (Wymer & Regan, 2005) and (Premkumar & Roberts, 1999). Some studies, such as Sila (2013), Wymer & Regan (2005) and Alam (2009) found that the cost is a significant factor in adoption of e-commerce by SME.

Environmental factors

The business environment is a major force that can encourage or inhibit an organization to adopt innovation. These environmental factors consist of pressure from suppliers/customers, competitive pressure, public policy and government's role (Rashid & Al-Qirim, 2001).

1. Customers/Suppliers Pressure

The customer/suppliers pressure means the degree of pressure from customers/suppliers perceived by SMEs. In many cases, the customers/suppliers have the power to pressure on SMEs to adopt innovations. Multinational corporations often pushed their branches and suppliers to adopt e-commerce technology to link into their global production network. They also argue that the greater the pressure from trading partners perceived by the SME, the more likely the SME to adopt certain technology innovation in offer to maintain their own competitive position, as particularly SMEs often depend economically on their larger partner to survive (Duan et al., 2012).

2. Competitor Pressure

Competitor pressure refers to the extent of pressure from competitors within the industry as felt by the firm (Zhu & Kraemer, 2005). When competitors start to use e-commerce technology, firms will be shoved into adopting e-commerce technology more widely to obtain competitive advantages. Thus, the higher the level of competition within the industry, the more likely it is that greater e-commerce use will be affected. Previous studies have supported that competitive pressure has a

significant relationship with the intention to adopt e-commerce (Morteza et al., 2011), (Tiago & Maria, 2010), (Al-Qirim, 2007), (Zhu & Kraemer, 2005) and (Zhu et al., 2002).

3. Government Support

Government also play an important role in the country to create innovation environment for the local businesses and make effective policies and regulations which are useful especially for SMEs. But in many developing countries, government are not playing any efficient role. The elimination of strict control and deregulation of telecommunication systems is necessary for many developing economies to implement ICT infrastructure on trade policies that are easy and beneficial for SMEs (Lawrence & Usman, 2010). With the help of active trade policies, many organizations will benefit from the ICT environment for widespread Internet use in various development sectors of many developing economies (Alrawabdeh, 2014).

4. Technology Vendor Support

Besides those factors, previous literature has mentioned that technology support from vendors is also a determined factor in e-commerce adoption, especially for the SME (Morteza et al., 2011) and (Al-Qirim, 2007). As SMEs lack IT related employees or personnel and also financial resources to hire IT skills from external source. Hence, to overcome the IT skill problems, the availability of technology support from vendor can be considered as an effective way for SMEs in the adoption of e-commerce. The study by Al-Qirim (2007) found that support from a technology vendor was one of determinant factors in extranet/VPN adoption by SMEs in New Zealand. Also, similar result was obtained by Morteza et al. (2011) and Li et al. (2010).

Individual Factors

Most SMEs in Nepal are owner/manager-based type and usually, strategic decision is highly dependent on such one person. As cited by Shah Alam et al. (2011), the manager/owner is decisive in deciding of innovation adoption in the SME. Cloete et al. (2002) also revealed that e-commerce adoption by the SME depends extensively on the acceptance of e-commerce technology by the owner of business. It is reasonable, because structurally SMEs tend to centralize, and therefore the owner/manager have an important role in any business decision making (Nguyen and Waring, 2013). Issues surrounding individual persons are an important aspect of the adoption of ICT and e-commerce in any organization. In organizations, the position of individuals matters a lot as they are supposed to be generalist (Drew, 2003) in performing their functions. Most personnel are either in key managerial positions or are classified in a unit or function that performs a certain task or numerous tasks (Demirbas et al., 2011).

1. Owner/ Manager's Innovativeness

Innovativeness refers to the degree to which a person adopts innovation more quickly than others in the same social context (Marcati et al., 2008). Wojtkowski & Hardesty (2001) suggested that for the successful adoption of e-commerce technologies, the owner-manager must have a reasonable, practical knowledge of the new technology. According to the idea of “factors of knowledge” explained by Attewell (1992), the expertise and knowledge development of different users can facilitate and accelerate the adoption of the latest innovations such as e-commerce. Thong & Yap (1995) mentioned that an innovative manager is the one who tends to seek a solution by changing the structure where the problem is located. As commonly known, in spite of a lot of advantages offered by e-commerce technology, such technology also has risk, especially if it is applied in a small business and even more so when in a developing country. Hence, the more innovative SMEs owner/manager the more likely he/she has the intention to adopt the e-commerce application (Ghobakhloo & Tang, 2013). Moreover, the desire of owner to become more innovative will accelerate the adoption of Information System (IS) (Ghobakhloo & Tang, 2013). Previous studies have found that the owner/manager’s innovativeness as a determinant factor in innovation adoption. For example, Thong and Yap (1995) found that the owner/manager/CEO’s innovativeness as determinant factors in IS adoption. Wymer and Regan (2005) found that innovativeness as a significant factor that influenced SMEs in Kentucky, USA in adopting e-commerce. Morteza et al. (2011) and Ghobakhloo and Tang (2013) found manager’s innovativeness as a significant factor in e-commerce adoption within the SME.

2. Owner/Manager’s Involvement

This part is related to the support that is given by them to e-commerce adoption. This is not only related to the provision of resources but also related to a motivational aspect that it is important to motivate the entire organization about the potential benefits of technology innovation. In regard to resources provision, as described previously, to be able to adopt technology innovation, such as e-commerce, certain resources are needed; therefore financial support from manager/owner will determine the speed of e-commerce adoption. (Shemi, 2012) and (Karakaya & Shea, 2008) cited that an active owner-manager usually transforms SME goals and corporate structure to develop the organisation further. When the owner-manager of the SME is inactive and does not appreciate the importance of ICT innovation, there is stifling growth in the business. In respect to motivational aspects, through the involvement of the owner/manager, the organization feels ready and motivated to adopt technologies such as e-commerce. In addition, owner/manager involvement will help to overcome barriers and resistance to change in the organization (Duan et al., 2012). Hence, the owner/manager’s involvement is considered as a determinant factor in adoption of e-

commerce by an SME. This is supported by several previous studies. Sila (2013), Duan et al. (2012), and Li et al. (2010), all of whom found that support from management has a positive impact on ecommerce adoption. Then, Al-Qirim (2007) found CEO involvement as important factor in e-commerce adoption by SMEs in New Zealand.

3. Owner/ Manager's IT Knowledge

It cannot be denied that one of the problems faced by SMEs in terms of IT adoption is insufficient ability in IT/IS knowledge (Morteza et al., 2011). If a manager has greater knowledge in IS/IT, the manager will be confident in IT adoption and it will reduce the uncertainty and risk in that adoption. insufficient IT skills is one common SME problem. In addition to this, it is also believed that user skill and knowledge can assist and increase the speed of technology adoption (Morteza et al., 2011). More importantly, it assumes that if manager/owner comprehends the function and advantages of e-commerce adoption, they may be more pleased to adopt such technology. Kiplangat et al. (2015) showed the results of Kenyan SMEs that ICT innovative knowledge levels among employees have a significant influence on the adoption of e-commerce in the firms surveyed. Macharia (2009) also found that the low level of technical skills and computer literacy among owner-managers and employees influences the adoption of SMEs in Kenya. More importantly, it assumes that if owner/managers comprehend the function and advantages of e-commerce adoption, they may be more pleased to adopt e-commerce technology. Several previous studies supported these explanations. Thong and Yap (1995) and Thong (1999) found that the manager's IT knowledge a determinant factor in IT adoption by SMEs in Singapore. Then, Thi & Lim (2011) and Looi (2005) also found that owners/managers IT knowledge to be a determinant factor that influenced SMEs in adoption of ecommerce.

Methodology

This research is mono methodology based (quantitative) where the researcher shall use survey questionnaire that will be asked to be completed or filled-out by company owners/managers.

The study design, whereby information and data are to be collected from the field and analyzed through tables, charts, figures etc. This shall offer valuable insight that compliment and expand the general truth which was gathered from the respondents.

The total population of cottage and SMEs in Nepal is 400,000 (Acharya, 2017). 95 percent confidence level for the equation, the required sample is calculated to be 400. The respondents are small and medium company owners, entrepreneurs, managers or CFOs (if the entrepreneurs/managers are unavailable) in Kathmandu.

The researcher shall use two methods: telephone calls and emails to owners/managers for collecting primary data for the research analysis.

The data obtained from these methods may help to provide much more information about current situation of Internet access and e-commerce in Nepal.

The researcher will analyze all the variables by using basic statistics, One-Way ANOVA and multiple-regression technique. As the quantitative method is being used to collect primary data, they will be calculated using SPSS software.

Results

The analysis of the model for factors influencing e-commerce adoption by SMEs in Nepal includes areas such as planning and goal setting for human resource development, skill and knowledge development in line with new technology, promoting and supporting lifelong learning, competitive aggressiveness, and risk acceptance.

1. To verify the appropriateness of each factor, which includes Organizational factors such as technology readiness (X_{11}) and firm size (X_{12}), Technological factors such as perceived benefits (X_{21}), compatibility (X_{22}), and cost (X_{23}), Environmental factors such as customer/supplier pressure (X_{31}), competitor pressure (X_{32}), government support (X_{33}), and technology vendor support (X_{34}), and Individual factors such as owner/manager's innovativeness (X_{41}), involvement (X_{42}), and IT knowledge (X_{43}), which are related to e-commerce adoption by SMEs in Nepal (Y). Stepwise multiple regression analysis was utilized, which was appropriate for predicting the factors influencing e-commerce adoption by SMEs in Nepal.

The analysis of the appropriateness of the factors influencing e-commerce adoption by SMEs in Nepal found that the p-value equals .000, which is less than 0.01, indicating that the factors Influencing E-commerce Adoption by SMEs in Nepal, including Organizational factors include technology readiness (X_{11}) and firm size (X_{12}). These factors consist of perceived benefits (X_{21}), compatibility (X_{22}), and cost (X_{23}). This includes customer/supplier pressure (X_{31}), competitor pressure (X_{32}), government support (X_{33}), and technology vendor support (X_{34}). Individual factors involve owner/manager's innovativeness (X_{41}), involvement (X_{42}), and IT knowledge (X_{43}), which is the e-commerce adoption by SMEs in Nepal (Y). are statistically significant at the .01 level.

2. In the analysis of factors influencing e-commerce adoption by SMEs in Nepal, the researcher considered the variables including Organizational factors such as technology readiness (X_{11}) and firm size (X_{12}), Technological factors such as perceived benefits (X_{21}), compatibility (X_{22}), and cost (X_{23}), Environmental factors such as customer/supplier pressure (X_{31}), competitor pressure (X_{32}), government support (X^{33}),

and technology vendor support (X_{34}), and Individual factors such as owner/manager's innovativeness (X_{41}), involvement (X_{42}), and IT knowledge (X_{43}), in relation to the e-commerce adoption by SMEs in Nepal (Y). Considering the appropriateness of the above model and the highest coefficient of determination (R^2), the findings are presented statistically significant at the 0.05 level.

The analysis found that variables that can predict the e-commerce adoption by SMEs in Nepal (Y) include firm size (X_{12}), owner/manager's involvement (X_{42}), owner/manager's innovativeness (X_{41}), customer/supplier pressure (X_{31}), and technology readiness (X_{11}). These variables can jointly predict the e-commerce adoption by SMEs in Nepal (Y) by 51.50%. The researcher has thus written the predictive equation in terms of the standard score as follows: the e-commerce adoption by SMEs in Nepal (Y) = $0.569 + (0.204\text{firm size: } X_{12}) + (0.226\text{owner/manager's involvement: } X_{42}) + (0.176\text{owner/manager's innovativeness: } X_{41}) + (0.143\text{customer/supplier pressure: } X_{31}) + (0.088\text{*technology readiness: } X_{11})$.

From the hypothesis H1: which tests the significant relationship between organizational factors and e-commerce adoption, the findings present a clear narrative. The organizational factors under consideration include technology readiness (X_{11}) and firm size (X_{12}). The derived equation for the e-commerce adoption by SMEs in Nepal (Y) suggests a base value of 0.569, with firm size contributing a weight of 0.204 and technology readiness a weight of 0.088 to the model.

The presence of these variables in the equation indicates their roles as predictive factors for e-commerce adoption. Firm size (X_{12}), with its relatively higher coefficient, implies a more significant impact on e-commerce adoption, suggesting that larger firms are possibly more inclined or better equipped to adopt e-commerce. This could be due to larger firms having more resources and capabilities to implement such digital transformations. Technology readiness (X_{11}), though with a smaller coefficient, is nonetheless a significant predictor, indicating that the level of preparedness in terms of technology affects the likelihood of e-commerce adoption. It could imply that even smaller firms, if technologically ready, are positioned to adopt e-commerce effectively. As the equation illustrates, the combined influence of these factors accounts for a specific proportion of the variance in e-commerce adoption among SMEs in Nepal. It reflects how internal company attributes can either facilitate or hinder the adoption of e-commerce, reinforcing the notion that internal readiness and scale are both crucial to successfully navigating the digital marketplace.

The study's findings serve as a guide for SMEs in Nepal, pointing to the need for a focus on enhancing technological infrastructure and scaling business operations to leverage the full potential of e-commerce. They also provide insights for policymakers and business support agencies to tailor their programs and interventions

to help SMEs in these specific areas, ultimately contributing to the broader goal of digital economic transformation in the region.

From the hypothesis H4, which assesses the significant relationship between individual factors and e-commerce adoption, the research findings elucidate the pivotal role of the owner/manager's characteristics in the digital transition of SMEs in Nepal. The individual factors in question include the owner/manager's innovativeness (X_{41}) and involvement (X_{42}) in the adoption process.

Starting with the premise that personal attributes of business leaders directly influence organizational change, the predictive equation suggests that owner/manager's involvement (X_{42}) has a more substantial weight (0.226) in comparison to innovativeness (X_{41}). This indicates that the degree to which owners or managers are engaged with the e-commerce adoption process is a strong predictor of successful implementation within their businesses.

The significance of owner/manager's involvement (X_{42}) may be attributed to the direct impact that engaged leadership has on strategic decision-making and resource allocation. Managers who are actively involved in the adoption process are likely to drive the initiative forward, overcome resistance to change, and champion the integration of new technologies within their business operations.

In addition to involvement, owner/manager's innovativeness (X_{41}) is also a positive contributor to e-commerce adoption, albeit with a slightly lower coefficient (0.176). This factor encapsulates the propensity of business leaders to embrace new ideas and innovations, which is critical in the dynamic and rapidly evolving e-commerce landscape.

These findings from the hypothesis testing underscore the importance of the human element in technological adoption. They suggest that SMEs in Nepal could enhance their e-commerce adoption rates by fostering a culture of innovation and by encouraging owners and managers to take an active role in the digital transformation process.

Ultimately, the study implies that interventions aiming to promote e-commerce in SMEs should not only focus on technological solutions but also on developing the skills and competencies of the individuals leading these organizations. By understanding the significance of these individual factors, stakeholders can design more effective strategies to support SMEs through the e-commerce adoption journey. From the hypothesis H3, which investigates the significant relationship between environmental factors and e-commerce adoption, the research findings reveal that customer/supplier pressure (X_{31}) plays a notable role in the e-commerce adoption by SMEs in Nepal. The equation developed from the data analysis posits that e-commerce

adoption (Y) can be predicted with a base value of 0.569, with an additional weight of 0.143 attributed to customer/supplier pressure (X_{31}).

Starting with the acknowledgment that environmental factors exert a considerable influence on business operations, the finding that customer/supplier pressure has a significant positive coefficient suggests that external market forces are a driving factor in the decision to adopt e-commerce. This pressure likely comes from the need to meet customer expectations for online services and to keep pace with suppliers who are increasingly digitizing their operations.

The importance of customer/supplier pressure (X_{31}) in this equation indicates that SMEs are responsive to their transactional environments. As customers and suppliers evolve to embrace digital transactions, SMEs must adapt to remain competitive and to continue to engage effectively with their stakeholders.

Further analysis reveals that while other environmental factors such as competitor pressure, government support, and technology vendor support were considered, it is the customer/supplier pressure that stands out as the most influential in this context. This suggests that, while supportive policies and a competitive marketplace are important, it is the direct interaction with customers and suppliers that most strongly dictates the urgency and direction of adopting e-commerce solutions.

The implication of this finding is significant for both business strategy and policy formulation. For SMEs, it highlights the importance of aligning business practices with the expectations and technological advancements of their suppliers and customers. For policymakers, it underscores the need to create an environment that facilitates digital transactions not just among businesses, but also between businesses and their suppliers and customers.

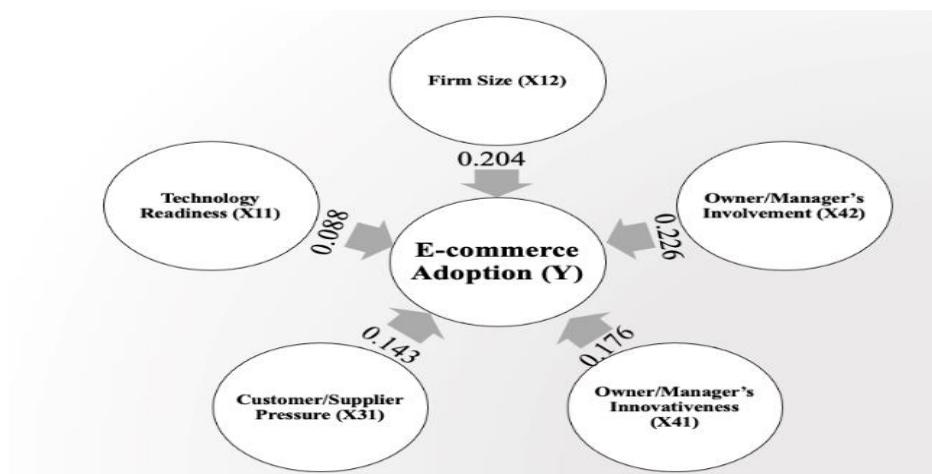
In conclusion, the study suggests that to encourage e-commerce adoption among SMEs in Nepal, stakeholders should consider strategies that enhance the digital engagement capabilities of these businesses, focusing particularly on improving their interactions with customers and suppliers in the digital domain.

Given Hypothesis H2, which examines the significant relationship between technological factors and e-commerce adoption, it is observed that no individual technological factor—perceived benefits (X_{21}), compatibility (X_{22}), and cost (X_{23})—emerges as a predictor in the e-commerce adoption by SMEs in Nepal. This result suggests that while these factors are individually important, they may not independently predict e-commerce adoption in the studied context. Commencing with the understanding that technological factors are typically crucial for e-commerce adoption, the absence of a significant predictive relationship in this instance raises important questions. It prompts a re-evaluation of the role these factors play within

the specific environment of Nepalese SMEs. It may indicate that while these factors are necessary, they are not sufficient on their own to drive the adoption of e-commerce.

The lack of a direct predictive relationship does not imply these factors are irrelevant; rather, it may suggest that their influence is mediated through other variables not included in the model or that the combination of these factors operates in a more complex manner than the model captures. For instance, the perceived benefits of e-commerce might be recognized by business owners, but without sufficient technical support or infrastructure, the realization of these benefits might not be enough to influence the adoption decision. Furthermore, the finding invites consideration of additional aspects that could be influential, such as external market forces, the regulatory environment, or socio-economic conditions. The interplay of these elements with technological factors could provide a more comprehensive understanding of e-commerce adoption among SMEs in Nepal.

In conclusion, while the hypothesis testing did not identify a significant relationship between the specified technological factors and e-commerce adoption, this outcome highlights the need for a broader examination of the e-commerce ecosystem in Nepal. It suggests that future research should incorporate a wider range of variables to fully understand the drivers and barriers to e-commerce adoption for SMEs in developing economies.



Picture 2 Predictive Factors for E-commerce Adoption by SMEs in Nepal.

The analysis from Picture 1 indicates that several factors can predict the adoption of e-commerce by SMEs in Nepal. These include the size of the business (X_{12}), the involvement of the owner/manager (X_{42}), the owner/manager's innovativeness (X_{41}), customer/supplier pressure (X_{31}), and technology readiness (X_{11}).

Combined, these factors can predict e-commerce adoption by SMEs in Nepal up to 51.50%. The researcher has formulated a predictive equation in standard score terms as follows: e-commerce adoption by SMEs in Nepal (Y) = $0.569 + (0.204 \text{ firm size: } X_{12}) + (0.226 \text{ owner/manager's involvement: } X_{42}) + (0.176 \text{ owner/manager's innovativeness: } X_{41}) + (0.143 \text{ customer/supplier pressure: } X_{31}) + (0.088 \text{ technology readiness: } X_{11})$. This analysis demonstrates that the size of the business, the involvement and innovativeness of the owner or manager, pressure from customers or suppliers, and technological readiness significantly influence e-commerce adoption among SMEs. These factors are crucial indicators that affect the decision-making of SMEs regarding whether or not to adopt e-commerce in their operations. Understanding these factors and applying them in strategic planning for e-commerce is essential for SMEs in Nepal. Being technologically prepared, fostering executive engagement, and responding to the needs and expectations of customers and suppliers are key factors that can help SMEs effectively embrace and succeed with e-commerce.

Recommendation

These empirical findings of this paper have provided important insight of the determinate factors E-commerce Adoption by SMEs in Napal. It has provided the general overview in the subject matter, but it needs detail study which is based on Napal setup specifically on individual countries in the continent. Thus, for the future study, high level study of factors affecting the adoption of e-marketing in Napal must be undertaken to fully utilize the benefits of E-commerce Adoption by SMEs in Napal. Therefore, advanced statistic can be applied to confirm the model, and also qualitative research can be done for more in-depth information and results of research

References

Acharya, P.R. (2017). **Small businesses create big impact on economy.** The Himalayan Times, epaper. Retrieved from <https://thehimalayantimes.com/business/small-businesses-create-big-impact-economy/>

Alam, Syed S., Ali, M.Y., & Jani, Fauzi M. (2011). An empirical study of factors affecting electronic commerce adoption among SMEs in Malaysia. **Journal of Business Economics and Management**, 12(2), 375-399.

Al-Qirim, N. (2005). An Empirical Investigation of E-commerce Adoption- Capability Model in small businesses in New Zealand. **Electronic Markets**, 15(4), 418-437.

Alrawabdeh, W. (2014). How Employees' Loyalty Programs Impact Organisational Performance within Jordanian Banks? *International Business Research*, 7(9).

Attewell, P. (1992). Technology Diffusion and Organisational Learning: The Case of Business Computing. *Organisation Science*, 3(1), 1-19.

Ayyagari, M., Demirguc-Kunt, A., & Maksimovic, V. (2011). Small vs. Young Firms Across the World, contribution to employment, job creation and growth. *The World Bank Development Research Group*.

Chand, S., & Kumar, B.A. (2017). E-commerce Adoption of Small and Medium Enterprises in Fiji. *Fijian Studies*, 15(2), 99-110.

Demirbas, D., Hussain, J.G., Matlay, H. (2011). "Owner-managers' perceptions of barriers to innovation: empirical evidence from Turkish SMEs". *Journal of Small Business and Enterprise Development*, 18(4), 764-780.

Duan, X, Deng, H, & Corbitt, B. (2012). Evaluating the critical determinants for adopting e-market in Australian small and medium sized enterprises. *Management Research Review*, 35(3/4), 289-308.

Gibbs, J.L., & Kraemer, K.L. (2004). A Cross-Country Investigation of the Determinants of Scope of E-commerce Use: An Institutional Approach. *Electronic Markets*, 12(2), 124-137.

Ghobakhloo, M., & Tang, S.H. (2013). The role of owner/manager in adoption of electronic commerce in small business: The case of developing countries. *Journal of Small Business and Enterprise Development*, 20(4), 754-787.

Grandon, E., & Pearson, J. (2004). Electronic Commerce Adoption: An Empirical Study of Small and Medium US Businesses. *Information and Management*, 42, 197-216.

Hachimi, A., Salahddine, A., & Housni, H. (2017). SME Financing in Morocco: Issues and Alternatives. *Journal of Innovation & Business Best Practice*, 1-8.

Iacovou, C.L., Benbasat, I., & Dexter, A.S. (1995). Electronic Data Interchange and Small Organisations: Adoption and Impact of Technology. *MIS Quarterly*, 19(4), 465-485.

Jeyaraj, A., Rottman, J.W., & Lacity, M.C. (2006). A Review of the Predictors, Linkages and Biases in IT Innovation Adoption Research. *Journal of Information Technology*, (21), 1-23.

Johnson, M. (2010). Barriers to innovation adoption: a study of e-markets. *Industrial Management & Data Systems*, 110(2), 157-174.

Kapurubandara, M., & Lawson, R. (2006). *Barriers to Adopting ICT and e-commerce with SMEs in developing countries: an Exploratory study in Sri Lanka*. University of Western Sydney, Australia.

Karakaya, F., & Shea, T. (2008). Underlying Motivations for Establishing Ecommerce Business and Their Relationship to E-commerce success. *Journal of Internet Commerce*, 7(2), 153-179.

K.C., S. K., & Timalsina, A.K. (2016). Challenges for Adopting E-commerce in Agriculture in Nepalese Context: a Case Study of Kathmandu Valley. *Proceedings of IOE Graduate Conference*. Kathmandu, Nepal.

Kiplangat, B.J., Shisia, A., & Asienga, I.C. (2015). Effects of human competencies in the adoption of ecommerce strategies among SMEs in Kenya. *International Journal of Economics, Commerce and Management*, 3(10).

Lawrence, J., & Usman, A. (2010). Barriers to e-commerce in developing countries. *Information, Society and Justice*, 3(1), 23-35.

Li, J., Wang, Y.F., Zhang, Z.M., & Chu, C.H. (2010). Investigating acceptance of RFID in Chinese firms: The technology-organization-environment framework. Paper presented at RFID-Technology and Applications (RFID-TA) 2010 IEEE International Conference.

Morteza, G., Daniel, A.A., & Jose, B.A. (2011). Adoption of e-commerce applications in SMEs. *Industrial Management & Data Systems*, 111(8).

OECD. (2017). *Enhancing the Contributions of SMEs in a Global and Digitalised Economy*. Paris: OECD.

Oxley, J., & Yeung, B. (2001). E-commerce Readiness: Institutional Environment and International Competitiveness. *Journal of Internaitonal Business Studies*, 32(4), 705-723.

Palvia, P., Means Jr, D.B., & Jackson, W.M. (1994). Determinants of computing in very small businesses. *Information & Management*, 27(3), 161-174.

Premkumar, G., & Roberts, M. (1999). Adoption of new information technologies in ural small businesses. *Omega*, 27(4), 464-484.

Rashid, M., & Al-Qirim, N. (2001). E-commerce technology adoption framwork by New Zealand small to medium size entreprese. *Research Letters in the Information and Mathematical Sciences*, 2(1), 63-70.

Rogers, E.M. (2003). *Diffusion of innovation*. New York: The Free Press.

Scupola, A. (2009). SMEs' e-commerce adoption: perspectives from Denmark and Australia. *Journal of Enterprise Information Management*, 22(1/2), 152-166.

Seyal, A.H., Awais, M.M., Shamail, S., & Abbas, A. (2004). Determinants of Electronic Commerce in Pakistan: Preliminary Evidence from Small and Medium Enterprises. *Electronic Markets*, 14(4), 372-387.

Shemi, A.P. (2012). *Factors Affecting E-commerce Adoption in Small and Medium Enterprises: An Interpretive Study of Botswana*. University of Salford, UK.

Sila, I. (2013). Factors affecting the adoption of B2B e-commerce technologies. **Electronic Commerce Research**, 13(2), 199-236.

Teo, T. S., & Ranganathan, C. (2004). Predicting intention to adopt interorganisational linkages: an institutional perspective. **MIS Quarterly**, 19-49.

Thi, L.S., & Lim, H.E. (2011). Estimating the Determinants of B2B E-commerce Adoption among Small & Medium Enterprises. **International Journal of Business and Society**, 12(1), 15.

Thong, J.Y.L., & Yap, C.S. (1995). CEO characteristics, organizational characteristics and information technology adoption in small businesses. **Omega**, 23(4), 429-442.

Thong, James Y.L. (1999). An integrated model of information systems adoption in small businesses. **Journal of Management Information Systems**, 15(4), 187-214.

Tiago, O., & Maria, F. M. (2010). Understanding e-business adoption across industries in European countries. **Induatrial Management & Data Systems**, 110(9).

Tornatzky, L.G., & Klein, K.J. (1982). Innovation characteristics and innovation adoption-implementation: A meta-analysis of findings. **IEEE Transactions on engineering management**, 29(1), 28-45.

Tornatzky, L., & Fleischer, M. (1990). **The processes of technological innovation**. Lexington Books.

Turban, E., King, D., Mc Kay, J., Marshall, P., Lee, J., & Viehland, D. (2008). **Electronic commerce: A managerial perspective**. New Jersey: Pearson Prentice Hall (5 ed.).

Wit, G., & Kok, J. (2014). Do small businesses create more jobs?: new evidence for Europe. **Small Business Economics**, 42(2), 283-295.

Wojtkowski, W., & Hardesty, J.C. (2001). Reality of Use and Nature of Change in Small Business: A Case Study in Inefficient Compromise. M. Khosrow-Pour. **Annals of Cases on Information Technology: Applications and Management** (217-225). USA: Idea Group Publishing.

Wymer, S.A., & Regan, E.A. (2005). Factors Influencing e-commerce Adoption and Use by Small and Medium Businesses. **Electronic Markets**, 15(4), 438-453.

Zhu, K., Kraemer, K.L., & Xu, Sean. (2002). **A cross-country study of electronic business adoption using the technology-organization-environment framework**. Paper presented at *Twenty-Third International Conference on Information Systems*.

Zhu, K., & Kraemer, K. (2005). Post -adoption variations in usage and value of e-business by organisation: cross-country evidence from the retail industry. **Information Systems Research**, 16(1), 61-84.