

## **A Structural Equation Model of Barriers to E-Commerce Adoption and Innovation in Fiji**

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### **Abstract**

The internet has significantly changed the new models of business-to-business and business-to-consumer interactions. As a result, e-commerce has developed rapidly worldwide, but the adoption of this technology in Fiji is very slow. Data for this study was collected by distributing the self-administered questionnaires to small business managers. The findings from this study confirm that barriers to e-commerce adoption have a negative and statistically significant impact on e-commerce expenditure and a mediated effect on the level of innovation. Expenditure on e-commerce has a positive and statistically significant impact on the adoption of e-commerce and the level of innovation. Another interesting finding emerged that expenditure on e-commerce has a statistically significant impact on the perception of the cost involved in setting up an e-commerce website. Studies on the organisational factors influencing the adoption of e-commerce are scarce in small island developing countries. Specifically, the findings from this study extend the Technology Organisation Environment (TOE) by investigating how the organisational-specific factors influence the adoption of e-commerce in Fiji. The findings from this study have implications for policymakers and practitioners.

**Keywords:** E-commerce adoption; Expenditure; Innovation; Website

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## **Introduction**

The business environment for commerce is changing rapidly as modern consumers rely extensively on electronic means of buying goods (Kang et al., 2021). Information computer technology (ICT) is the major stimulator of change experienced by businesses worldwide (Cutshall et al., 2021; Fawzy et al., 2018; Soodan & Rana, 2020). Interestingly, the United States has the biggest inclination for online shopping at the commencement of 2023, with approximately 43% of customers indicating that they would prefer purchasing items online rather than in-store; however, a significant number of consumers in countries such as Austria, Finland and New Zealand preferred going to physical shops (Statista, 2024).

Buying and selling goods over the e-commerce platform has only been possible by introducing the Internet (Butt et al., 2021). E-commerce is defined as buying and selling goods over computer networks (Butt et al., 2021). Undoubtedly, e-commerce and e-business are the major catalysts for economic development as they provide several benefits to the users of e-commerce platforms (Fawzy et al., 2018; Salah & Ayyash, 2024; Soodan & Rana, 2020). Some benefits of e-commerce to organisations include improved product quality, wider customer reach and an innovative means of selling goods and services (Soodan & Rana, 2020). Globally, large, medium and small companies are reaping the benefits of e-commerce witnessed during the COVID-19 pandemic (Cui et al., 2019; Chen et al., 2020; Chundakkadan & Sasidharan, 2023).

Unfortunately, the adoption of e-commerce for buying and selling goods online is in the early stages of development in Fiji. Most small businesses have established websites to advertise their business rather than for e-commerce transactions (Chand & Kumar, 2017; Kurnia, 2015). Fiji had witnessed socio-economic turmoil during the COVID-19 pandemic that required businesses to adopt e-commerce to adhere to national restrictions on coronavirus disease. Before the COVID-19 pandemic struck Fiji, the information technology sector grew rapidly, placing Fiji in a relatively stronger position than its neighbouring Pacific Island Countries (PICs) (Naidu, 2017; Naidu et al., 2014, 2022, 2023). According to the latest statistics produced by Digital Fiji (2021), it is clear that the number of internet users in Fiji has increased by 8.2% between the years 2020 and 2021. Social media users in Fiji increased by 8.9% between 2020 and 2021 (Digital Fiji, 2021). Mobile connection statistics indicate 1.25 million mobile phone connections in Fiji as of January 2021. A slight decrease (2.6%) in mobile phone connections is noticed between January 2020 and January 2021 (Digital Fiji, 2021).

Fiji's economic performance will significantly improve if small businesses in Fiji adopt e-commerce technology for buying and selling goods over e-business platforms (Naidu & Chand, 2012a, 2012b, 2017). However, small businesses in Fiji are facing major barriers to e-commerce adoption. These include a high setup and maintenance cost, a lack of skilled workforce, a high cost of training and development, poor internet connection, a lack of availability of software and a high cost of acquiring software (Chand & Kumar, 2017; Kurnia, 2015). A synthesis of existing literature on e-commerce adoption indicates several studies on barriers to e-commerce adoption in large developed countries. There are few studies conducted on barriers to e-commerce adoption in small island developing countries (see, for example, Kabanda & Brown, 2015; Molla & Licker, 2005a, 2005b). Previous studies have not examined the barriers to e-commerce adoption in Fiji and the impact of these barriers on e-commerce expenditure and the level of innovation (Kabanda & Brown, 2015; Molla & Licker, 2005a, 2005b). This study extends the existing literature by exploring the common

organisational barriers inhibiting small businesses from adopting e-commerce. By doing this, the study endeavours to make a noteworthy contribution to the literature on barriers to e-commerce adoption and innovation.

Small business owners' international and regional experience with e-commerce adoption has been unique, as each country's factor endowments or the set of resources it has are distinct from others, providing it with capabilities to compete in the international markets (Lin et al., 2011). Undoubtedly, this study provides information to policymakers and practitioners on the current state of e-commerce in Fiji and provides sustainable solutions for addressing these barriers to boost Fiji's economic growth (Lin et al., 2011). Government policymakers and practitioners must address these hindrances as soon as possible, as these hindrances will have far-reaching consequences on Fiji's overall economic situation (Lin et al., 2011). The main objective of this study is to examine the relationship between barriers to e-commerce adoption, expenditure on e-commerce, adoption of e-commerce, perception of the cost involved in setting up an e-commerce website and level of innovation.

The rest of the paper is organised as follows. Section two provides theoretical perspectives, literature review and hypothesis development. Section three outlines the research model and hypotheses. Section four outlines the research methodology. Section five presents the research findings. Section six discusses these research findings. Section seven presents the conclusion, contribution, implications and limitations.

## **Theoretical Perspectives, Literature Review and Hypothesis Development**

### **Technology Organisation Environment**

The Technology Organisation Environment (TOE) framework, developed by Tornatzky *et al.* (1990), is one of the prominent models used in the existing literature to explain the factors that influence the decision of the firm's managers to use technology. According to Tornatzky and Fleischer (1990), three factors, organisational, technological and external environmental, influence a manager's decision to use technology. First, the organisational factors are informal and formal processes, resource availability and communication processes that influence the manager's decision to adopt the technology. Second, the technological context includes the availability of technology and specific technological features that may support the adoption of e-commerce. Third, the environmental factors are those from the wider external environment, such as technological infrastructure, changes in socio-economic conditions and government regulation that create barriers to technology adoption. Several studies have investigated the technological and external environmental factors that explain small businesses' barriers to adopting e-commerce (Al-Bakri & Katsioloudes, 2015; Lin et al., 2011).

However, studies on the organisational factors influencing the adoption of e-commerce remain scarce in developing countries. Walker et al. (2016) integrated the TOE to investigate the eight factors influencing e-commerce adoption. Walker and his colleagues found that compatibility, organisational readiness and external pressure positively influence e-commerce adoption among Slovakian small and medium enterprises (SMEs). Al-Bakri and Katsioloudes (2015) found that internal and external environmental factors, mainly organisation readiness, managers' perceptions and external pressures, influence small business managers' decisions to adopt e-commerce. Wymer and Regan (2005) considered environmental, knowledge, organisational and technological factors influencing e-commerce adoption. The findings from this study confirmed that cost, which was the

first-order construct, was the only significant factor influencing the adoption of e-commerce. Kabanda and Brown (2015) and Molla and Licker (2005a, 2005b) argued that organisational and environmental challenges in the least developed countries restrict small businesses from adopting e-commerce. Specifically, Molla and his colleague (Molla and Licker, 2005a, 2005 b) identified that lack of finance and technological expertise are two important factors inhibiting technology adoption. Lin et al. (2011) identified government laws, social structure, natural environment and technical changes as challenging factors inhibiting technology adoption.

Existing studies have validated the TOE framework. Although there is wide support for the TOE framework, several limitations exist. One of the major limitations of the TOE framework is that the constructs used to explain the technology adoption predictors are mainly applicable to large organisations in developed countries compared to small businesses in developing countries. As a result, the TOE framework does not sufficiently explain the e-commerce barriers faced by small businesses in developing countries. According to Awa et al. (2015), existing studies have largely ignored the contextual issues small businesses face in developing countries. Therefore, this study seeks to extend the existing literature by investigating how organisational-specific factors influence the adoption of e-commerce by small businesses in Fiji. Figure 1 presents the research model that traces the relationship between barriers to e-commerce adoption, e-commerce expenditure, e-commerce adoption, perception of the cost involved in setting up an e-commerce website and level of innovation.

### **Literature on Barriers to E-commerce Adoption by Small Businesses**

Most of the studies on barriers to e-commerce adoption are devoted to large developed countries, with researchers giving little importance to the difficulties facing developing countries (Al-Bakri & Katsioloudes, 2015; Molla & Licker, 2005a, b; Hempel & Kwong, 2001; Tran, 2021). Studies that do exist are mainly descriptive, which lack a theoretical contribution grounded in the socio-cultural context. This study seeks to extend the existing literature by analysing e-commerce adoption in a small island developing country, Fiji. Specifically, this study seeks to identify the barriers to e-commerce adoption in Fiji and how these barriers are related to expenditure on e-commerce and the level of innovation. According to Tan et al. (2007), Tan et al. (2009) and Ghobakhloo et al. (2011), the research on e-commerce adoption in the least developing countries has received immense attention as changes in the environmental factors coerced businesses to use online e-commerce platform for buying and selling of goods.

Tran (2021), Al-Bakri and Katsioloudes (2015), Molla and Licker (2005a, 2005b) and Hempel and Kwong (2001) argued that e-commerce adoption reduces the transaction costs in business-to-business transactions. Ignat and Chankov (2020), Alyoubi (2015) and Chwelos et al. (2001) found that the benefits of e-commerce are reduction in communication costs, improved accuracy, transformative advantages and creating an enabling environment for business process re-engineering and value chain integration. Gregory et al. (2019), Cui and Pan (2015), Ordanini and Rubera (2010) and Zhu and Kraemer (2002) found a significant link between an organisation's e-commerce resources and business value/performance gain. Kurnia et al. (2015) found that organisational factors that influence an organisation's readiness for e-commerce adoption are the high cost of e-commerce setup and maintenance cost, lack of skilled workforce, high cost of training, poor internet connection, lack of availability of e-commerce software and high cost of acquiring advanced e-commerce software. Hizam-Hanafiah and Soomro (2021), Awiagah et al. (2016), Mazzarol (2015)

and Thong and Yap (1996) confirmed that small business owners are least likely to adopt e-commerce technology if the perceived losses from adopting the technology are too high. Feng et al. (2019), Kabanda et al. (2018), Zaied (2012) and Oliveira and Martins (2011) argued that expensive countermeasures (such as antivirus programs, internet security programs and encryption tools) act as a backbone for maintaining an e-commerce system. Choshin and Ghaffari (2017), Gilianiana et al. (2011) and MacGregor and Vrazalic (2008) confirmed that organisational factors strongly influence e-commerce technology adoption than technological factors.

These studies discussed the organisational costs and risks of maintaining a fully functional e-commerce system. Lacka and Yip (2018) and Hong and Zhu (2006) confirmed that perceived obstacles negatively affected e-commerce migration. Susanty et al. (2020) and Senarathna et al. (2014) found a positive correlation between adhocracy culture and e-commerce adoption. Hoang et al. (2021) found that technology-perceived compatibility has the greatest impact on e-commerce adoption. Trinugroho et al. (2021) found that the firm's and owner's characteristics influence barriers to digital technology adoption. Pérez-Amaral et al. (2020), Ocloo et al. (2020), Kshetri (2007) and Nikolaeva (2006) found that barriers to e-commerce adoption are negatively correlated to the expenditure on e-commerce and the level of innovation.

Regarding the context of Fiji, there is a lack of e-commerce research focusing on small businesses in Fiji. There are two main reasons. First, there is a lack of data on small businesses in Fiji. As a result, data collection agencies hardly provide data to small business researchers in Fiji. Second, the operations of many small businesses in Fiji are transactional rather than transformational. Small business managers invest little in research and development and focus more on completing the daily activities to survive the small business. The main objective of this study is to investigate the barriers to e-commerce adoption and its relationship to e-commerce expenditure, e-commerce adoption, perception of the cost involved in setting up an e-commerce website and level of innovation. Third, existing studies have hardly investigated the indirect or mediated effect of barriers to e-commerce adoption, expenditure on e-commerce adoption and level of innovation.

This study aims to enhance the existing literature by investigating the relationship between barriers to e-commerce adoption, e-commerce expenditure, e-commerce adoption, perception of the cost involved in setting up an e-commerce website and level of innovation. By doing so, this study seeks to make a significant contribution to the literature on barriers to e-commerce adoption and innovation.

## **Research Model and Hypotheses**

### **Research Model**

The conceptual model presented in Figure 1 is developed based on the TOE framework (Tornatzky et al., 1990). Primarily, this research model argues that the barriers to e-commerce adoption (BECA) influence e-commerce expenditure (EE), which further influences e-commerce adoption (EA), perception of the cost involved in setting up an e-commerce website (PC) and level of innovation (LI).

## **Hypotheses development**

The barriers to e-commerce adoption have received significant attention in the existing literature by academics from several disciplines, such as management (Hoang et al., 2021; Nikolaeva, 2006), technology (Choshin & Ghaffari, 2017), information systems (Kshetri, 2007; Senarathna et al., 2014). Several studies in the e-commerce management literature investigate technological and external barriers to e-commerce adoption. Besides, studies on the organisational barriers influencing e-commerce adoption demand further exploration (Kurnia et al., 2015).

One of the fundamental roles of the policymakers and practitioners is to lessen the barriers to e-commerce adoption faced by small businesses, particularly in developing countries where there is a dearth of studies on organisational barriers to e-commerce adoption. Barriers to e-commerce adoption are an important determinant of business expenditure on e-commerce. According to Pérez-Amaral et al. (2020), Ocloo et al. (2020), Kshetri (2007) and Nikolaeva (2006), the stronger the barriers to e-commerce adoption, the likelihood of small businesses spending money on e-commerce significantly decreases. The common organisational barriers faced by small businesses in developing countries are high e-commerce setup cost, high e-commerce maintenance cost, lack of skilled workforce, high cost of training, poor internet connection, lack of availability of e-commerce software and high cost of acquiring e-commerce software (Kurnia et al., 2015; Mkansi, 2021). This study also argues that when barriers to e-commerce adoption increase, the e-commerce expenditure falls for small businesses. Thus, this study hypothesise the following:

*H1: Barriers to e-commerce adoption influence expenditure on e-commerce by small businesses.*

There is increasing attention in the technology acceptance literature to understand the relationship between e-commerce expenditure, adoption of e-commerce and the perception of the cost involved in setting up an e-commerce website (Kshetri, 2007; Nikolaeva, 2006; Ocloo et al., 2020; Pérez-Amaral et al., 2020). According to Mkansi (2021), there is a higher adoption of e-commerce in developed countries than in developing countries. Developed countries have a conducive external and technological environment to support small businesses in setting up a fully operational e-commerce organisational infrastructure. Unfortunately, small businesses in developing countries cannot easily adapt to an e-commerce system as they lack competent financial resources (Ghobakhloo et al., 2011; Tan et al., 2007; Tan et al., 2009). Several studies have confirmed that small business managers are least likely to adopt e-commerce if they perceive the cost and risk of e-commerce adoption is too high (Al-Khalaf & Choe, 2020; Nguyen, 2021; Zhao et al., 2020). Setting up an e-commerce system is not a one-off cost to small managers. Business managers must implement several countermeasures to set up a safe and secure e-commerce system (Feng et al., 2019; Kabanda et al., 2018; Oliveira & Martins, 2011; Zaid, 2012). These are the additional costs that small business managers incur to manage a fully operational e-commerce system. Therefore, the authors hypothesise that:

*H2: Expenditure on e-commerce influences the adoption of e-commerce by small businesses.*

*H3: Expenditure on e-commerce influences the perception of the cost involved in setting up an e-commerce website.*

In the technology acceptance literature, the adoption of e-commerce and the perception of the cost involved in setting up an e-commerce website is constantly used to explain the level of innovation (Kshetri, 2007; Nikolaeva, 2006; Ocloo et al., 2020; Pérez-Amaral et al., 2020; Trinugroho et al., 2021). According to Kickul and Gundry (2011), the taxonomic model that considers e-commerce innovation is based on the availability of financial resources and the deployment of e-commerce innovation. The three important areas of knowledge related to e-commerce innovation are infrastructure-related innovation, content innovation and services innovation (Kikul & Gundry, 2001). This study considers infrastructure, content and service innovation as e-commerce, encompassing deploying the best state-of-the-art technology, content and service to sell goods to customers online (Kikul & Gundry, 2001). From the business perspective, e-commerce is considered an innovation because it uses high-quality business knowledge to provide products and services to customers (Ocloo et al., 2020; Pérez-Amaral et al., 2020; Trinugroho et al., 2021). The characteristics of innovation influence society's rapidity of accepting technology. E-commerce technology not only reduces the cost of business operations but also reaches out to those customers who are struggling to visit physical business stores (Ocloo et al., 2020; Pérez-Amaral et al., 2020; Trinugroho et al., 2021). Undoubtedly, the cost of adopting e-commerce innovation is another important factor determining the innovation level. Thus, the hypotheses below are proposed:

*H4: Adoption of e-commerce influences the level of innovation in small businesses.*

*H5: Perception of the cost involved in setting up an e-commerce website influences small businesses' innovation level.*

In addition to the above-discussed relationship, this study also investigates the indirect relationship between barriers to e-commerce adoption, expenditure on e-commerce and level of innovation (Kshetri, 2007; Nikolaeva, 2006; Ocloo et al., 2020; Pérez-Amaral et al., 2020). A strong barrier to e-commerce adoption implies that small businesses are least likely to adopt e-commerce, which will put downward pressure on the level of innovation (Abou-Shouk & Eraqi, 2015; Al-Somali et al., 2005; Hong & Zhu, 2006). Similarly, expenditure on e-commerce shares a positive relationship with the level of innovation. The higher the expenditure on e-commerce, the greater the likelihood of adopting e-commerce technology for innovation purposes (Kshetri, 2007; Nikolaeva, 2006; Ocloo et al., 2020.; Pérez-Amaral et al., 2020). The cost of adopting e-commerce technology is another important psychological factor that actively influences the level of innovation (Al-Bakri & Katsioloudes, 2015; Hempel & Kwong, 2001; Molla & Licker, 2005a, 2005b; Tran, 2020). Therefore, the authors hypothesise the following;

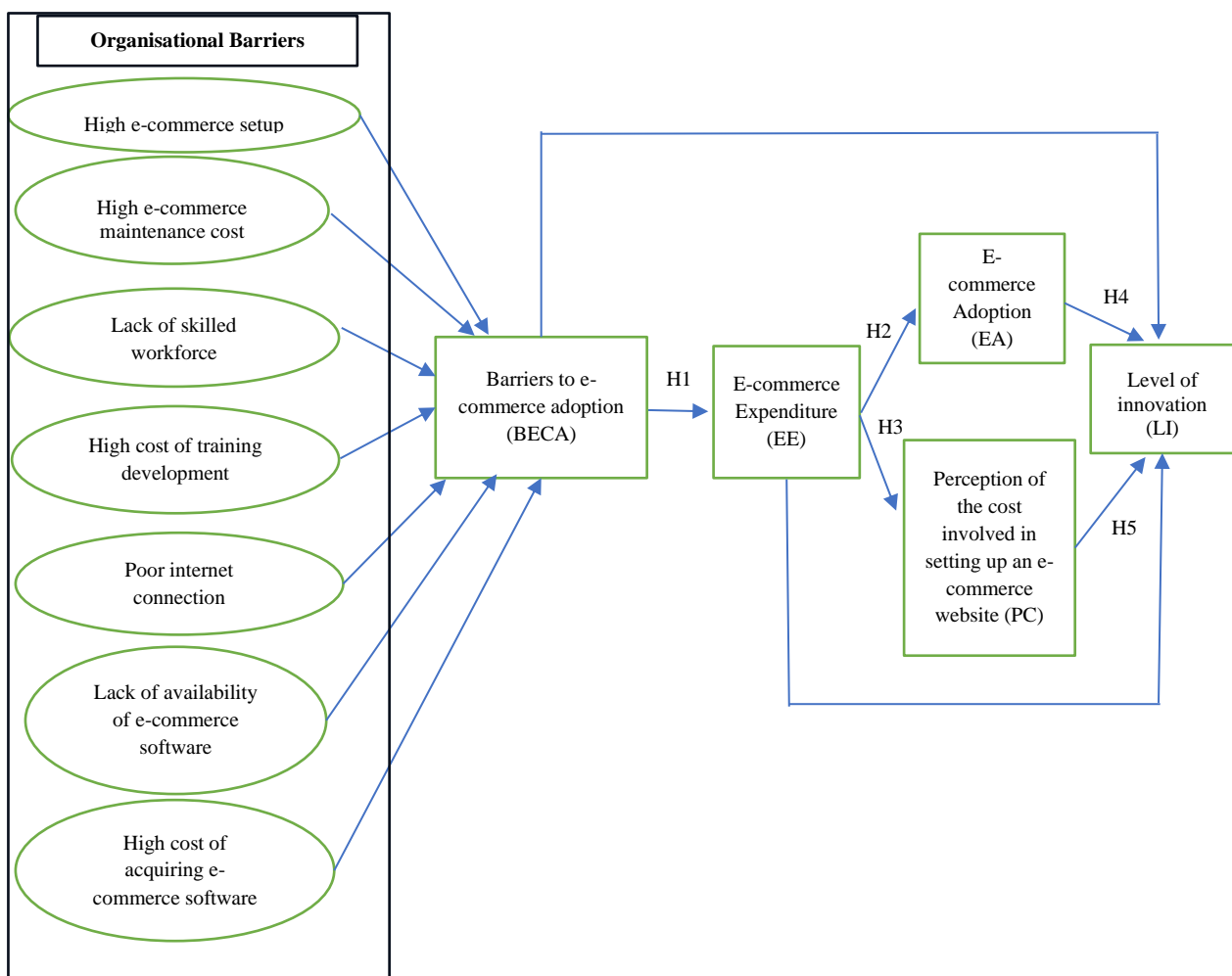
*H6: Barriers to e-commerce adoption have an indirect or mediated effect on the level of innovation.*

*H7: Expenditure on e-commerce has an indirect or mediated effect on the level of innovation.*

Ballast water management began to draw global attention in the 1980s and was eventually addressed by the International Maritime Organization (IMO). In 2004, the International Convention for the Control and Management of Ship's Ballast Water and Sediments (BWM Convention) was adopted (International Maritime Organization, 2004). The Ballast Water Management Convention was enacted in 2017 and 175 member states signed on. The Ballast Water Management Convention requires all ships of member countries to implement a ballast water management plan that meets their standards and keeps detailed records of their ballast water. In 2004, the United States Coast Guard (USCG) established rules for discharging ballast water in US waters that are at least as

stringent as the IMO regulations (33 CFR Part 151 and 46 CFR Part 162). They also require maintaining an approved ballast water management plan with written records of uptake, transfers and discharges. These ballast water records must be submitted by all foreign and domestic vessels to the USCG 24 hours prior to arrival in US ports, with some exemptions. For example, vessels that engage in “short distance voyages” are exempt from both ballast water management requirements and ballast water reporting requirements. “Short distance voyages” include vessels that operate exclusively in one Coast Guard Captain of the Port sector. This is of particular concern for the U.S. Pacific jurisdictions as Sector Honolulu COTP covers all of the Hawaiian island chain, American Samoa, Wake Island, Midway Island, Johnston Atoll, Kingman Reef, Palmyra Atoll, Jarvis Island, Baker Island and Howland Island.

Figure 1. Conceptual Model



### Research Methodology

The primary aim of this study is to integrate the TOE framework to investigate the relationship between barriers to e-commerce adoption, e-commerce expenditure, e-commerce adoption, perception of the cost involved in setting up an e-commerce website and level of innovation. Several definitions and criteria define micro, small and medium businesses in different countries (Naidu & Chand, 2011; Schaper et al., 2011). For example, in Australia, a micro-enterprise is defined as a firm having less than 5 employees (< 5 employees); a small business firm has 5-19 employees; a medium-



sized business has 20-199 employees; and large firms have more than 200 employees (> 200 employees). In contrast, in China, a small business must fulfil two criteria: (a) less than 500 staff and (b) annual sales of less than 30 million yuan. The Commonwealth Secretariat (2010) defines a micro business with 1-10 employees, a small business has 11-50 employees and 51-200 employees is classified as a medium-sized firm. All businesses in this study are small businesses with 11-50 employees.

Self-administered questionnaires were distributed to small business managers to collect data for this study. The questionnaires were sent to 150 business managers across Fiji. The questionnaire had statements/questions in English. Participation in the survey was voluntary and respondents were informed of this. The questionnaires were distributed to only those who were keen to participate in the survey. Out of these 150 managers, 116 completed the questionnaires. This gave a response rate of 77.3%. Several reminder messages were sent to those not responding to the questionnaires. For those not responding, at least three reminder notices were sent. All the questionnaires were completed in October 2021. A purposive sampling technique was used to collect data from the target population. Once these questionnaires were completed, the researchers collected the questionnaires. This study used the IBM SPSS AMOS 18.0 software to conduct data analysis. Cronbach's alpha was used as an indicator to determine the reliability of the scales used for this study.

The conceptual model presented in Figure 1 emphasises that small businesses face seven barriers to e-commerce adoption. These barriers include high e-commerce setup cost, high e-commerce maintenance cost, lack of skilled workforce, high cost of training, poor internet connection, lack of availability of e-commerce software and high cost of acquiring e-commerce software (Kurnia et al., 2015; Mkansi, 2021).

## **Measures**

A five-point Likert scale, 1 to 5, was used to measure the barriers to e-commerce adoption. On this scale, one represented strongly disagree, while five represented strongly agree. Respondents had to rate their level of agreement on the statements related to barriers to e-commerce adoption faced by small businesses. Table 1A in the Appendix shows the items used to measure the constructs in this research.

## **Demographic Details of the Respondents**

Table 1 presents the demographic details of the respondents. Out of the 116 respondents, 69 were males and 47 were females. The statistics show that more male small business managers participated in the survey than females. Regarding the distribution of the respondents in the age group, 47 were between the ages of 18 and 30 years, 51 were between 31 and 40 years, 14 were between 41 and 50 years and 4 were over 51 years of age. Out of the 116 small businesses in our sample, 11 small businesses had annual sales of less than FJ\$15,000, 25 had sales between FJ\$15,001 to FJ\$30,000, 10 had sales between FJ\$30,001 to FJ\$45,000, 70 had their sale slightly above FJ\$45,000. The structure of the small businesses in our sample was divided into sole traders (71), partnership (18), limited liability (13) and unlimited liability companies (14).

Table 1. Details of Respondents

Demographic Profile Characteristics		Number	Percentage
Gender	Male	69	59.5%
	Female	47	40.5%
Structure of small business	Sole trader	71	61.2%
	Partnership	18	15.5%
	Limited liability	13	11.2%
	Unlimited liability	14	12.1%
Age group	18-30	47	40.5%
	31-40	51	44.0%
	41-50	14	12.1%
	51 years and over	4	3.4%
Annual Sales (\$F)	\$15,000 and less	11	9.5%
	\$15,001 - \$30,000	25	21.6%
	\$30,001 - \$45,000	10	8.6%
	\$45,000 and above	70	60.3%

## Results

### Measurement Model

This study used the IBM-SPSS AMOS program v28 to conduct the confirmatory factors analysis (CFA) on e-commerce expenditure as a second-order construct and barriers to e-commerce adoption as a first-order construct. The model was extended to include the chain effect of e-commerce expenditure, e-commerce adoption, small business managers' perception of the cost involved in setting up an e-commerce website and the level of innovation. We assessed the measurements of the goodness of fit and overall fitness indices to determine whether the structural model was satisfactory. Table 2 indicates that the goodness of fit and overall fitness indices slightly deviate from the threshold levels. The Conformity Factor Analysis (CFA) was used to assess the reliability of the constructs. All the items met the criteria for normal distribution, common method bias and multicollinearity before CFA was conducted. The Cronbach's alpha for the factors used to measure the barriers to e-commerce adoption was greater than 0.07. According to Fornell and Larcker (1981) and Chin (1998) the cutoff values for the composite reliability ( $CR > 0.70$ ) and average variance extracted ( $AVE > 0.5$ ) were used to assess the reliability of the model. Table 3 shows that the indices are acceptable and within the satisfactory range. The discriminant validity of the model was used to assess the degree to which the concepts used are distinct from each other (Bagozzi, 1994). The discriminant validity of the model was established by comparing the square root of the AVE with the correlations of the factors used to measure barriers to e-commerce adoption. Table 4 presents the correlations of the factors used to measure the barriers to e-commerce adoption with the AVE values.

Table 2. Measurements of Goodness of Fit and Overall Fitness Indices

Indices	Values
$\chi^2$	157.195
$p$	0.000
$\chi^2/df$	3.66
GFI	0.823
IFI	0.759
TLI	0.684
CFI	0.753
RMSEA	0.152

Table 3. Results of the Factor Loadings

Construct	Items	Factor Loadings	Cronbach's $\alpha$	Composite Reliability	AVE
Barriers to E-commerce Adoption	BECA1	0.780	0.834	0.883	0.521
	BECA2	0.830			
	BECA3	0.544			
	BECA4	0.695			
	BECA5	0.679			
	BECA6	0.733			
	BECA7	0.757			

Table 4. Construct Correlations for Fornell &amp; Larcker Criterion

Variable	Mean	S.D.	BECA1	BECA2	BECA3	BECA4	BECA5	BECA6	BECA7	SqR AVE
BECA1	3.34	0.770	-							0.721
BECA2	3.34	0.697	0.716**							
BECA3	3.19	0.617	0.172	0.214*						
BECA4	3.16	0.672	0.562**	0.476**	0.386**					
BECA5	3.28	0.720	0.339**	0.449**	0.151	0.424**				
BECA6	3.23	0.738	0.362**	0.505**	0.227*	0.273**	0.627**			
BECA7	3.41	0.747	0.491**	0.532**	0.375**	0.366**	0.361**	0.596**	-	

### Structural Model

Structural equation modelling was applied to the model presented in Figure 1 using the IBM-SPSS AMOS program v21. Table 5 shows that barriers to e-commerce adoption have a negative and statistically significant impact on e-commerce expenditure ( $\beta=-0.971$ ;  $p < 0.05$ ). Next, we showed that the standardised total (direct and indirect) effect of barriers to e-commerce adoption on e-commerce expenditure is -0.314, which implies that when barriers to e-commerce adoption go up by one standard deviation, e-commerce expenditure goes down by 0.314 standard deviations. Thus providing strong support for Hypothesis 1.

In addition, we also found that a higher expenditure on e-commerce leads to greater adoption of e-commerce ( $\beta=0.816$ ;  $p < 0.001$ ) and a poor perception of the cost involved in setting up an e-commerce website ( $\beta=0.971$ ;  $p < 0.001$ ). The standardised total (direct and indirect) effect of e-commerce expenditure on e-commerce adoption and perception of the cost involved in setting up an

e-commerce website are 0.503 and 0.538, respectively. This implies that when expenditure related to e-commerce goes up by one standard deviation, adoption of e-commerce and the perception of the cost involved in setting up an e-commerce website go up by 0.503 and 0.538, respectively. Thus, this supports Hypotheses 2 and 3 (see Tables 5 and 6 and Figure 2).

Furthermore, we found that e-commerce adoption has a positive and statistically significant impact on innovation. Thus, providing support for hypothesis 4 (see Tables 5 and 6 and Figure 2). Next, we showed that perceptions of the cost of setting up an e-commerce website do not share a statistically significant relationship with innovation. Thus, our findings do not support Hypothesis 5 (see Tables 5, 6 and Figure 2). Finally, hypotheses 6 and 7 proposed that barriers to e-commerce adoption and expenditure on e-commerce have an indirect or mediated effect on the level of innovation. The research findings in Tables 5 and 6 and Figure 2 support hypotheses 6 and 7. The indirect (mediated) effect of barriers to e-commerce adoption on the level of innovation is 0.049. This shows that when barriers to e-commerce adoption increase, the level of innovation goes up by 0.049. The indirect (mediated) effect of expenditure on e-commerce on the level of innovation is 0.051, which shows that as expenditure on e-commerce goes up by 1, the level of innovation goes up by 0.051.

Several important findings have emerged from this study. First, the research findings confirmed that the barriers to e-commerce adoption in developing countries influence e-commerce expenditure. Logically, strong barriers to e-commerce adoption would imply low spending on e-commerce. Second, expenditure on e-commerce has a statistically significant impact on e-commerce adoption and the perception of the cost involved in setting up an e-commerce website. Like the small business experiences in developed countries, the adoption of technology by small businesses in developing countries is contingent on the cost factor. Second, barriers faced by small businesses related to e-commerce adoption influence the expenditure of these businesses on e-commerce. This is intuitively acceptable as the stronger the barriers faced by the small businesses related to e-commerce adoption, the less expenditure small businesses are likely to invest in e-commerce. Third, the findings from this study also confirm that expenditures on e-commerce have a statistically significant impact on e-commerce adoption and perception of the cost involved in setting up an e-commerce website. Fourth, this study has confirmed that e-commerce adoption positively and statistically significantly impacts innovation. E-commerce is a sustainable tool, not only in developed countries but also in developing countries on the small islands. Although small business owners in Fiji perceive that e-commerce will lead to internal innovation, the facilitating conditions in Fiji are not present to accommodate e-commerce adoption. Fifth, barriers to e-commerce adoption and expenditure on e-commerce adoption have a mediated or indirect effect on innovation.

Table 5. Standardised Direct Effect Coefficients

<b>Independent/Control Variables</b>	<b>Dependent Variables</b>	<b>β</b>	<b>S.E</b>	<b>CR</b>	<b>p</b>
Barriers to e-commerce adoption (BECA)	Expenditure on e-commerce (EE)	-0.971	0.320	-3.031	**
Expenditure on e-commerce (EE)	Adoption of e-commerce (AE)	0.186	0.30	6.237	***
Expenditure on e-commerce (EE)	Perception of the cost involved in setting up an e-commerce website (PC)	0.196	0.029	-6.837	***

Adoption of e-commerce (AE)	Level of innovation (I)	0.272	0.090	-3.021	**
Perception of the cost involved in setting up an e-commerce website (PC)	Level of innovation (I)	-0.001	0.091	-0.013	0.989
Notes: ** refers to 5% level of significance *** refers to 0.1% level of significance					

Table 6. Standardised Total, Direct and Indirect Effect Coefficients

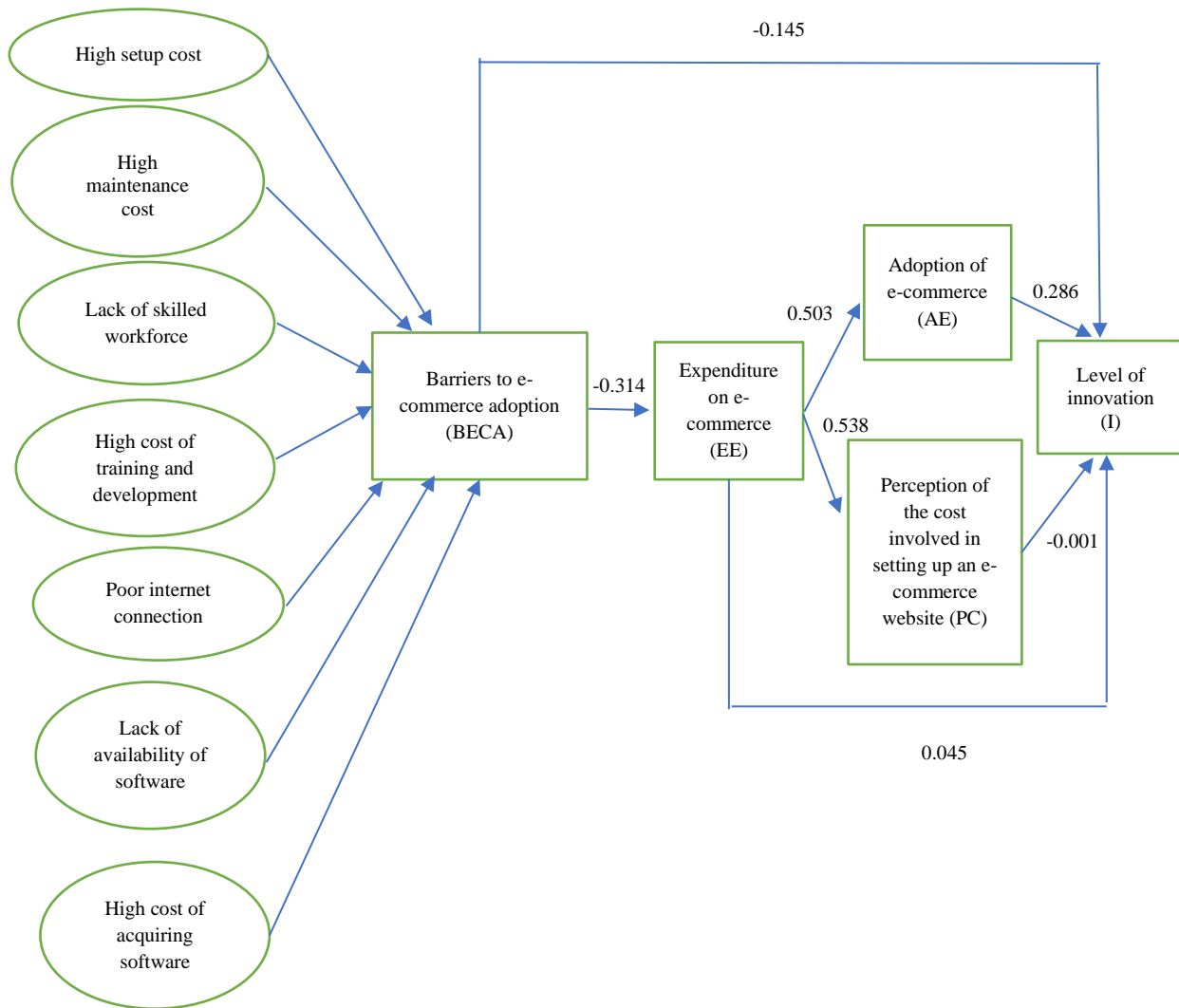
Independent/Control Variables	Dependent Variables	STE	SDE	SIE
Barriers to e-commerce adoption (BECA)	Expenditure on E-commerce (EE)	-0.314	0.314	0.000
Expenditure on e-commerce (EE)	Adoption of E-commerce (AE)	0.503	0.503	0.000
Expenditure on e-commerce (EE)	Perception of the cost involved in setting up an e-commerce website (PC)	0.538	0.538	0.000
Adoption of e-commerce (AE)	Level of innovation (I)	0.286	0.286	0.000
Perception of the cost involved in setting up an e-commerce website (PC)	Level of innovation (I)	-0.001	-0.001	0.000
Expenditure on e-commerce (EE)	Level of innovation (I)	-0.145	0.000	0.145
Barriers to e-commerce adoption (BECA)	Level of innovation (I)	0.045	0.000	0.045
<b>Notes:</b> STE: Standardised Total Effect SDE: Standardised Direct Effect SIR: Standardised Indirect Effect				

Table 7. Hypotheses Testing Results

Hypotheses	Path Estimates	Test Results
H1: Barriers to e-commerce adoption influence expenditure on e-commerce by small businesses.	-0.314	Supported
H2: Expenditure on e-commerce influences the adoption of e-commerce by small businesses.	0.503	Supported
H3: Expenditure on e-commerce influences perception of the cost involved in setting up an e-commerce website.	0.538	Supported
H4: Adoption of e-commerce influences the level of innovation in small businesses.	0.286	Supported
H5: Perception of the cost involved in setting up an e-commerce	-0.001	Not

website influences level of innovation in small businesses.		Supported
H6: Barriers to e-commerce adoption have an indirect or mediated effect on the level of innovation.	-0.145	Supported
H7: Expenditure on e-commerce has an indirect or mediated effect on the level of innovation.	0.045	Supported

Figure 2. Conceptual Model



## Discussions

This study identified seven internal organisational factors explaining barriers to e-commerce adoption and the indirect relationship these factors share with e-commerce expenditure and level of innovation. The findings from this study confirmed a robust direct relationship between barriers to e-commerce adoption and e-commerce expenditure and an equally indirect relationship with the level of innovation. Undoubtedly, small business managers in Fiji know that adopting e-commerce technology will eventually take their small businesses to greater heights. However, cost is a significant determinant of adopting e-commerce technology. This study highlighted several barriers hindering small businesses' readiness to adopt e-commerce technology. These barriers are high e-commerce setup cost, high e-commerce maintenance cost, lack of skilled workforce, high cost of

training, poor internet connection, lack of availability of e-commerce software and high cost of acquiring e-commerce software (Kurnia et al., 2015; Mkansi, 2021). A collaborative effort is needed from all stakeholders to address these barriers to e-commerce adoption and create a conducive business environment for small business e-commerce (Kshetri, 2007; Ocloo et al., 2020; Pérez-Amaral et al., 2020). Existing studies have confirmed that organisational barriers inhibiting the adoption of e-commerce technology play a stronger role in developing countries than in developed countries. Based on this research finding, it is easily argued that e-commerce adoption in Fiji is still emerging because the small business community in Fiji faces strong barriers to e-commerce adoption (Kurnia et al., 2015; Mkansi, 2021). Investment in e-commerce is not a one-off investment. It is a long-term investment whereby small business managers have to invest in e-commerce countermeasures to set up a fully operational e-commerce system. In developing countries, the high cost of long-term e-commerce investment influences small business's readiness to adopt e-commerce platforms. As confirmed by Mkansi (2021), Kurnia et al. (2015) and Grandon and Pearson (2003), small business managers in developing countries lack internal organisational resources to adopt e-commerce.

As common in several small island developing countries, small businesses in Fiji are still struggling to set up an e-commerce system. As confirmed by Mkansi (2021), Kabada and Brown (2015), Molla and Licker (2005a, 2005b) and Lin (2011), a major misfit in external and internal business processes will further delay the capability of small businesses to adopt a fully coherent e-business platform.

The findings from this study also confirmed that expenditure on e-commerce would influence the adoption of e-commerce and the perception of the cost involved in setting up an e-commerce website. Generally, the expenditure on e-commerce will determine whether small businesses in Fiji can adopt e-commerce. Overall expenditure on e-commerce also influences the small business managers' perception of the cost of setting up an e-commerce website. The availability of financial resources to small business managers determines the ability of the small businesses to afford skilled staff and purchase information computer technology to set up an e-commerce system. Mkansi (2021), Molla and Licker (2005a) and Hempel and Kwong (2001) have acknowledged the role of internal organisational factors in supporting the adoption of e-commerce technology.

Furthermore, the findings from this study also confirmed that e-commerce expenditure has a positive and statistically significant impact on e-commerce adoption and the perception of the cost involved in setting up an e-commerce website. This research finding is relatable to the findings of existing studies conducted by Nguyen (2021), Al-Khalaf and Choe (2020) and Zhao et al. (2020). These studies have confirmed that the greater the expenditure on e-commerce, the more likely it is for small businesses to adopt e-commerce platforms. Small business managers will have a poor perception of the cost of setting up an e-commerce website if the expenditure on e-commerce is too high. According to Feng et al. (2019), Kabanda et al. (2018), Zaied (2012) and Oliveira and Martins (2011), the cost of e-commerce adoption significantly increases as small business managers invest extensively in countermeasures to set up a safe and secure e-commerce system. This study also found that the perception of the cost involved in setting up an e-commerce website does not share a statistically significant relationship with the level of innovation. However, e-commerce adoption shares a statistically significant relationship with innovation. These results are consistent with the studies conducted by Thong and Yap (1996), Chwelos *et al.* (2001), Vrazalic (2008), Gilianiana et al. (2011) and Oliveira and Martins (2011), which argued that there are numerous benefits of adopting e-commerce. However, adopting e-commerce to boost innovation would be impossible if

they do not have sufficient financial resources.

### **Conclusion, Contributions, Implications and Limitations**

The paper traces the relationship between barriers to e-commerce adoption, e-commerce expenditure, e-commerce adoption, perception of the cost involved in setting up an e-commerce website and level of innovation. The findings from this study confirmed that some of the organisational barriers to e-commerce adoption in Fiji are high e-commerce setup cost, high e-commerce maintenance cost, lack of skilled workforce, high cost of training, poor internet connection, lack of availability of e-commerce software and a high cost of acquiring e-commerce software (Kurnia et al., 2015; Mkansi, 2021). These barriers to e-commerce adoption share an indirect statistically significant relationship with the level of innovation and a direct relationship with the e-commerce expenditure. This study also found that e-commerce expenditure has a statistically significant impact on the perception of the cost involved in setting up an e-commerce website and e-commerce adoption, as well as an indirect relationship with the level of innovation. This study will benefit numerous parties, such as small business owners and managers, government policymakers and practitioners. The findings from this study will be readily available to government policymakers, administrators and internet service providers, who will use these findings to generate sustainable solutions for e-commerce adoption.

This study has concluded that the lack of enthusiasm behind small business managers' decisions to adopt e-commerce in Fiji is strongly related to internal organisational barriers faced by small businesses. One of the main reasons behind focusing the main research questions on small businesses in Fiji is that there is hardly any data and research conducted on small businesses in Fiji. Since small businesses in Fiji have been growing fast, there is wide scope for economic growth in Fiji. Although the adoption of e-commerce is much slower in Fiji, any slight increase in e-commerce adoption will positively impact our society. This study has taken the first step in identifying the barriers to e-commerce adoption in Fiji. It has equally highlighted the role of the government in addressing these barriers.

This study has several policy implications. First, collaboration from multiple stakeholder groups is essential to address the barriers to e-commerce adoption faced by small businesses in Fiji. Several costless technology opportunities are available to small businesses and small businesses could take up these costless opportunities to sell products online. To access markets and customers, small business owners and managers should widely explore social media, such as Viber, Messenger, Instagram, WhatsApp and Twitter. Comparatively, costless social media provides small businesses with several opportunities, but e-commerce gives customers a much-needed boost in innovation and creativity. Business owners and managers must rekindle their interest and learn to use e-commerce to give their businesses a competitive edge. Importantly, they must come out of their comfort zones and acquire the required skills to navigate websites, take orders online, market products and services online and facilitate product distribution. Third, a financial support program could be established by the government of Fiji, whereby the government of Fiji could subsidise the cost of information computer technology infrastructure. Importantly, the government can play a critical role in reducing information computer technology costs, duties and tariffs on data. This study will help small business managers obtain a deeper understanding of the problems faced by the managers of small businesses in adopting information computer technology. It will also provide guidelines for future research-related disciplines.



There are several limitations of this study. First, we collected data from a limited number of small business owners. A wider study with a large sample size will achieve results that can be generalised across samples. Second, small business owners find it difficult to comprehend the logistics behind e-commerce adoption as this technology is in its early stages of development in Fiji. A large sample of well-educated and experienced small business owners will help us achieve a robust model. Third, the fit indices were slightly below the threshold levels.

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