IMPORTANCE OF PERCEIVED STRATEGIC VALUE OF E-COMMERCE: THE INTERACTION EFFECT OF PERSONAL INNOVATIVENESS

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ABSTRACT

This project explores the interaction effect of Personal Innovativeness in Information Technology (PIIT) on the relationship between determinants of Perceived Strategic Value of E-Commerce (PSVEC) and attitude towards E-Commerce adoption. Based on a survey of 15 carefully selected organisations from both the public and private sectors in Pakistan, the objectives are to (a) have an idea of what decision- makers in organisations think about the strategic value of E-Commerce in Public and Private sectors (b) examine the relationship between determinants of PSVEC and attitude towards E-Commerce adoption (c) and how PIIT impacts the relationship between determinants of PSVEC and attitude towards E-Commerce adoption. To ensure a higher degree of accuracy of results, all the variables in this study were measured on highly respected and validated scales from previous studies (Agarwal & Prasad, 1998; Subramanian & Nosek, 2001; Venkatesh & Davis, 2000). A second-generation technique; PLS Structural Equation Modelling (PLS-SEM) was used to analyse and process the data. Behavioural sciences suggest that Innovation adoption at the organisational level is more complicated than individual-level adoption as it involves both personal and organisational level factors (Rogers, 1995). E- Commerce adoption within an organisation heavily depends on the personal perceptions, beliefs and attitudes of the management (Ajzen, 1985; Davis, 1989). The study contributes to the existing knowledge by measuring and establishing relationships between personal-level factors and attitudes towards organisational level innovation adoption. An important (and unique) aspect of this study is that unlike most of the previous studies, more relevant and domain-specific latent variable PIIT is studied instead of the generic variable of personal innovativeness. As the E-Commerce adoption rate in developing economies is very low, the UN, WTO and World Bank have emphasised the developing economies to adopt E-Commerce and have initiated several programs to accelerate the E-Commerce adoption rate in underdeveloped countries. The study is likely to provide valuable insight into the nature of E- Commerce adoption in developing economies context.

Keywords: Perceived Strategic Value of E-Commerce, Personal Innovativeness in Information Technology, Intention to adopt E-Commerce, E-Commerce in developing economies, PLS-SEM

INTRODUCTION

E-Commerce gained popularity after the advent of the world wide web and electronic data exchange standards in 1990 (Chi Chu, Lawrence, VanHui, & Cheunga, 2007). Today, the internet-based virtual market has become the world's largest shopping mall (McQuitty & Peterson, 2000), providing several marketing opportunities (Pitt, Berthon, Watson, & Zinkhan, 2002).

E-Commerce has been defined in several ways. Lawrence et al. (1998) define E-Commerce as a trade of information, products and services using any computer connected by the Internet. According to Turban et al. (1999), E-Commerce is the process of trade and exchange of goods, services, or information through an electronic medium, primarily the Internet. McKay and Marshall (2004) define E- Commerce as doing business including selling, buying, exchanging products, servicing and information using a computer system and the Internet. In a broader E-

Commerce definition, Enance (2018) posits that E-Commerce is doing business using technology.

E-Commerce is booming across the world. However, its growth in different parts of the world is heterogeneous. The developing economies are showing far less E-Commerce adoption (UNCTAD, 2017, 2019). E-Commerce development in developing economies is important for foreign investment point of view as well as contrary to already developed and saturated economies, developing economies have a greater potential for return on investment (Harding & Javorcik, 2007). In the past most of the E-Commerce studies were done in developed economies, however, recently, a growing number of scholars are exploring different aspects of the E-Commerce adoption in the developing economies (Molla & Licker, 2005a). This study explores the E-commerce adoption in Pakistan by examining relationships between personal level characteristics of management with the organizational level E-Commerce adoption issues.

Pakistan is situated in South Asia. It is word's 5^{th} most populous country and area wise at number 33 (Statista, 2020). Its total population density is 275.3 people per sq km. The total GDP for the year 2019 was US$332.0 bn. Pakistan exports to several countries and its merchandise exports were US$23,485 million in 2018 out of which service-related exports were US $4,004 million. Pakistan's top exports include house linen, rice, non-knit men's suits, nonretail pure cotton yarn and heavy pure woven cotton. Major imports of Pakistan include crude oil, refined petroleum, computer, electronics. Iron scrap, organic chemicals, vehicles, manmade filament and plastics (Statista, 2020). Pakistan thus has great potential for cross-border e-trade. Pakistan is one of the countries in Morgan Stanley's Emerging Market Index, with great potential for investments (Stanley, 2020). Given the importance and potential of Pakistani economy in the overall world economy and the fact that E-Commerce renders country borders and boundaries meaningless, it is essential for business managers of developed countries to understand issues related to E-Commerce adoption and e-buying behaviour in Pakistan.

THEORETICAL BACKGROUND

Organisations to a large extent are derived by the attitudes and intentions of leadership (Jelenc & Pisapia, 2016) and while perceptions drive intentions and attitudes (Davis, 1989), it is essential to measure the perceptions to get an idea of the firms' behaviour. This study is based upon Roger's Theory of Diffusion of innovation (Rogers, 1995), Technology Acceptance Model (Davis, 1989; Venkatesh & Davis, 2000) and Theory of Planned Behaviour (Ajzen, 1985). We tried to explain the variation in intention to adopt E-Commerce at the organisational level through personal traits of decision-makers.

Intention to Adopt E-Commerce

Intention to adopt an innovation is determinant of adoption and previous studies have proved a positive relationship among this construct and Innovativeness (Herrero Crespo & Rodríguez del Bosque, 2008; Hwang, 2011; Limayem, Khalifa, & Frini, 2000; Wang & Ahmed, 2009) and "Perceived usefulness" (Wijesundara & Xixiang, 2018).

Strategic Value of Information systems

Information Systems are drivers of operational efficiency, general decision support and competitive advantage in organisations (Oh & Pinsonneault, 2007). Management and CIOs while making a business case of any ICT investment rely heavily on their perception, personal value system (Subramanian & Nosek, 2001) and experience to assess the organisational values and possible value of ICT investment (Saffu, DeBerry-Spence, Walker, & Hinson, 2008). Management in small organisations wants to drive more value out of ICT investments because

of low resources and given that Small and Medium Enterprises (SMEs) tend to have no dedicated management information system department, the personal perceptions and intentions of business owners and managers become even more crucial (Palvia & Palvia, 1999).

The research on strategic value has been on two theoretical perspectives; Resource cantered and Contingency-Based (Oh & Pinsonneault, 2007). Resource centred perspective has again two streams called "The production function view" (Hitt, Wu, & Zhou, 2002) and "Resource-Based" (Caldeira & Ward, 2003). Production function view treats ICT investment as an independent production input and typically report a positive relationship between ICT investment size and organisational performance (Barua, Kriebel, & Mukhopadhyay, 1995; Brynjolfsson & Hitt, 1996). Many scholars, however, posit that establishing a direct link between the size of IT investment and organisational performance is misleading (Mithas & Rust, 2016; Soh & Markus, 1995). The characteristics of an ICT system are thus an important factor to be considered. To gain long term sustainable competitive advantage a firm thus needs to acquire firm-specific ICT resources that are ideally unique and inimitable (Santhaam & Hartono, 2003).

Contingency perspective also emphasises proper alignment among contextual, structural and strategic factors to gain value from information technology. Any ICT investment not matching with the firm needs may lead to inefficiency or in some cases can prove disastrous. This explains why several massive ICT investments, for example, in ERPs led organisations to collapse (Jorfi, Nor, & Najjar, 2017; Kearns & Lederer, 2001). IT business alignment requires significant managerial input to correctly assess the strategic value of a given ICT system in given circumstances (Oh & Pinsonneault, 2007).

The conceptualisation of Perceived Strategic Value of E-Commerce (PSVEC)

Managers may conceptualise the strategic value of the Information Systems based on the kind of support that information systems provide. Subramanian and Nosek (2001) developed a scale for perceived strategic value measurement of Information Systems based on three types of support that an information system can provide. The construct is a 2nd order formative construct having three lower-level constructs namely "operational support", "managerial productivity enhancement" and "strategic decision aid" (Subramanian & Nosek, 2001). They linked these low-level constructs with the strategic vision of the organisational leadership as posited by (Segars & Grover, 1998). According to (Segars & Grover, 1998) organisational leadership may have a "vision to automate", "vision to informate" and "vision to transform". Automation within an organisation normally leads to cost reduction, better customer relationships and general operational efficiency. This aspect is covered as a dimension of **"Operational Support" (OS)** in Perceived Strategic Value of Information System (PSVIS). The vision to "Informate up" is associated with a managerial effort to access better inter and Intra organization collaboration with the help of communication channels and databases. This aspect of information system is covered by the **"Managerial Productivity Enhancement" (MP)** dimension of the PSVIS. Finally, "vision to transform" is aimed at achieving the reforms in the interface between customers and suppliers and is covered by the dimension named **"Strategic Decision Aid" (SDA)** of PSVIS (Subramanian & Nosek, 2001). For this study, we will use all three determinants of PSVIS independently instead of studying a second-order formative construct of "PSVIS". Since E-Commerce is an ICT application (Doukidis, Poulymenakou, Terpsidis, Themistocleous, & Miliotis, 1998), we can use determinants of PSVIS construct to measure the perceived strategic value of E-Commerce (PSVEC).

Relationship Between PSVEC and Intentions to adopt E-Commerce

Several innovation adoption models and theories have been used to explain adoption of E-Commerce. Among most frequently used models are Diffusion of Innovation Model (DOI), Institutional Theory, the theory of Planned Behaviour (TPB), Technology Organisation and

Environment model andTechnology Acceptance Model (Molla & Licker, 2005). According to the Technology Acceptance Model (Davis, 1989) and Theory of Planned Behaviour (Ajzen, 1985), perceptions form intentions that ultimately translate into behaviours. Several past studies have empirically established a positive relationship between perceived strategic value and ICT/ E-Commerce adoption (Del, Ana, & Antonio, 2006; Grandon & Pearson, 2014; Saffu et al., 2008; Saffu, Walker, & Mazurek, 2012).

Therefore, we can hypothesise that:

H1: Organisational Support determinant of PSVES is positively related to the intention to adopt E-Commerce.

H2: Managerial Productivity determinant of PSVES is positively related to the intention to adopt E- Commerce.

H3: Strategic Decision Aid determinant of PSVES is positively related to the intention to adopt E-Commerce.

Personal Innovativeness in Information Technology:

According to the Diffusion of Innovation Theory (DOI) (Rogers, 1995), an innovation travels in the form of special messages concerning new ideas through certain channels in members of the social system. Innovation is not adopted by individuals or organisations at once. Instead, it is adopted stepwise by five categories of adoption units both at an organizational and personal level. Rogers categorised the adoption units based on certain characteristics and named them innovators, early adopters, early majority, late majority and lagers. According to DOI, innovation is first adopted by "innovators" followed by early adopters, early majority, late majority and lastly by laggers. Several studies have empirically validated and tested the DOI both at organisational and individual levels.

The conceptualisation of Personal Innovativeness in Information Technology

Literature mentions two types of "innovativeness" construct in the field of information technology; global (Limayem et al., 2000) and domain-specific (Agarwal & Prasad, 1998). In the information technology context Domain-specific personal innovativeness in information technology has better prediction power than the global one (Hwang, 2011), the logic is simple, individuals who are innovators in one specific area may be laggers in another area. While several studies in the literature have examined the impact of "personal innovativeness" as a general construct (Jeong, Yoo, & Heo, 2009; Jianlin & Qi, 2010; Lee, Qu, & Kim, 2007; Lu, 2014) and "domain-specific innovativeness of I.T." (Agarwal & Prasad, 1998; Hwang, 2005) on behaviour towards online services and technologies, to the best of author's knowledge, there is no study in the literature that has examined the impact of PIIT on the relationship between PSVEC and intention to adopt E-Commerce.

Impact of Personal Innovativeness in Information Technology on PSVEC and Intention to adopt E-Commerce

According to Rogers' theory of Diffusion of innovation, "Innovators" are first to adopt the innovation (Rogers, 1995). "Innovativeness" in the specific domain of ICT is proved to have a positive direct and moderating effects on ICT adoption when studied with other independent variables (Agarwal & Prasad, 1998; Hwang, 2011).

Therefore, we can hypothesise that:

H4: Personal Innovativeness in IT is positively related to Intention to adopt E-Commerce adoption

H5: Personal Innovativeness in IT positively moderates the relationship between Operational Support and intention to adopt E-Commerce.

H6: Personal Innovativeness in IT positively moderates the relationship between Managerial Productivity and intention to adopt E-Commerce.

H7: Personal Innovativeness in IT positively moderates the relationship between Strategic Decision Aid and intention to adopt E-Commerce.

Figure -1 shows the research model.

METHODOLOGY

Sample and Data

Sample organisations were selected from the data available at the Chamber of Commerce in Lahore, Pakistan. Some public sector organisations were selected from the database maintained by relevant ministries. Selected organisations were sent questionnaire both online and through the local postal system. Out of the 243 questionnaires sent, 211 were returned. The data was processed, cleaned,and then analysed. After data cleaning stage 197 responses were found suitable for data analysis.

For a robust and meaningful PLS structural equation modelling the recommended sample size is ten times the number of observed variables in the largest construct. The construct "Operational Support" has the largest number of observed variables i.e. 6, So 60 observations are the minimum recommended sample size. Our sample size thus meets the sample size requirements (Hair, 1992, 2017).

Measurement of Constructs

All the constructs/ latent variables were measured using tested and validated scales used in previous studies. Intention to adopt E-Commerce was measured on the scale used by Venkatesh and Davis (2000). For measuring Perceived Strategic Value, scales developed by (Subramanian & Nosek, 2001) was used. Personal Innovativeness in IT was measured using the scale developed by Agarwal and Prasad (1998). All variables were measured on 5 points Likert Scale. Please refer to accompanying annexure (table 1) for details of the scales used.

RESULTS

Accompanying annexure (Table 2) shows descriptive data for variables. The mean value varies from 2.98 to 3.62. Data shows that the sample is skewed towards the intention to adopt E-Commerce. The above-average mean score of all the determinants of the strategic value of E-Commerce indicates that organisations are aware of the potential strategic benefits that E-Commerce adoption can offer.

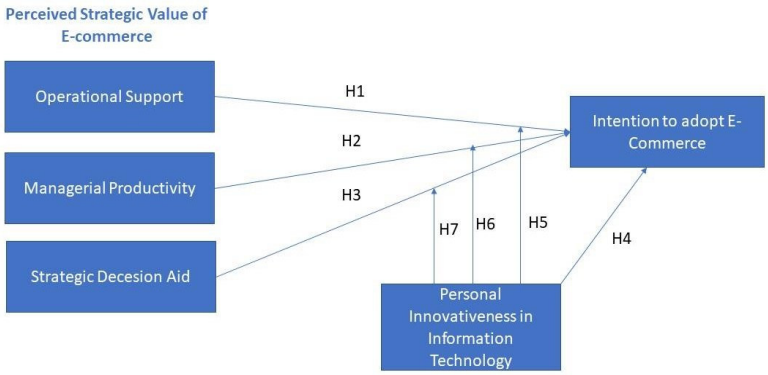


Figure 1

Convergent Validity

Three important elements recommended for assessing the convergent validity are factor loadings, Average variance explained (AVE) and Composite Reliability (CR). The recommended benchmark values for factors loading and AVE is 0.5 or above. Composite reliability is an indicator of the internal consistency of the measurement model. A value above 0.7 for CR is considered a good value (Hair, 2017). Table-1 shows the item loadings on the respective latent constructs and fall well within the acceptable range. Table -2 shows construct reliability and validity. All the values including Cronbach's Alpha, rho A and AVE fall within the recommended range (Hair, 2017).

Discriminant Validity

Discriminant validity ensures that the items that should theoretically relate with each other are not more related to the other constructs (Hubley, 2014). Two recommended criteria are that squared root ofAVE value of each construct should be (1) greater than 0.5 or above and (2) should be greater than all the values in the same column and the row-wise values in the column of other constructs called Farnell and Larcker criteria (Fornell & Larcker, 1981). Table 3 shows the matrix of Farnell Larcker criteria. The measurement model thus satisfies the criteria to ensure discriminant validity by Farnell and Larker.

Inner Model / Path Model

Figure 2 shows the model with corresponding path coefficients. The model with four constructs explains more than 60% of the variance in intention to adopt E-Commerce. Operational support with a path coefficient of 0.428 was found to be the strongest predictor of intention to adopt E-Commerce, followed by personal innovativeness in information technology and Managerial Productivity. Strategic decision aid with a path coefficient of 0.225 came at last position among the four constructs.

The model also shows three interaction effects. Although, all three moderating effects have positive path coefficients ranging from 0.057 to 0.108 but upon bootstrapping they were not found statistically significant. Table-3 in accompanying annexure shows the path coefficients with their respective significance.

Table 1. *Factors Loading*

Item	IAEC	MP	OS	PIIT	SDA
IAEC1	0.909				

IAEC2	0.917				
MP1		0.832			
MP2		0.835			
MP3		0.858			
MP4		0.822			
OS1			0.801		
OS2			0.767		
OS3			0.838		
OS4			0.789		
OS5			0.823		
OS6			0.787		
PIIT1				0.808	
PIIT2				0.893	
PIIT3				0.822	
PIIT4				0.847	
SDA1					0.851
SDA2					0.810
SDA3					0.810

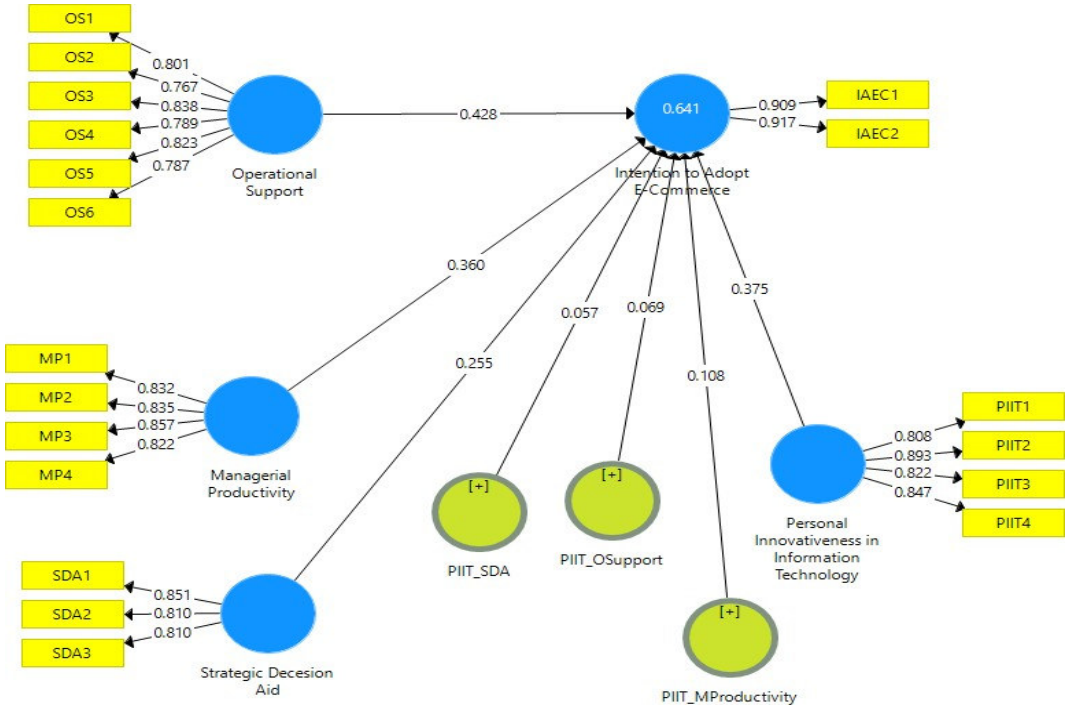
Table 2. *Constructs Reliability and Validity*

Construct	Cronbach's Alpha	rho_A	Composite Reliability	AVE
IAEC	0.801	0.801	0.909	0.834
MP	0.858	0.872	0.903	0.7
OS	0.888	0.89	0.915	0.642
PIIT	0.864	0.871	0.907	0.71
SDA	0.765	0.776	0.864	0.679

Table 3. *Discriminant Validity*

Construct	IAEC	MP	OS	PIIT	SDA
IAEC	**0.913**				
MP	0.394	**0.837**			
OS	0.472	-0.062	**0.801**		
PIIT	0.517	0.148	0.177	**0.843**	
SDA	0.236	-0.011	-0.063	-0.023	**0.824**

Figure 2. *Path Diagram*



Based on the data analysis we can summarise the results as listed in the table

Table 4. *Results*

Hypothesis	Result
H1: Organisational Support determinant of PSVES is positively related to the intention to	Supported
H2: Managerial Productivity determinant of PSVES is positively related to the intention to	Supported
H3: Strategic Decision Aid determinant of PSVES is positively related to the intention to	Supported
H4: Personal Innovativeness in IT is positively related to Intention to adopt E-Commerce	Supported

H5: Personal Innovativeness in IT positively moderates the relationship between Operational Support and intention to adopt E-Commerce.	Not Supported
H6: Personal Innovativeness in IT positively moderates the relationship between Managerial Productivity and intention to adopt E-Commerce.	Not Supported
H7: Personal Innovativeness in IT positively moderates the relationship between Strategic Decision Aid and intention to adopt E-Commerce.	Not Supported

CONCLUSION

The research project was aimed at exploring how some personal characteristics of managers impact the organisational level decisions in the context of E-Commerce adoption. Two important personal characteristics were chosen to study their impact on intentions to adopt E-Commerce. Managers/decision-makers from both public and private sectors were taken as the sample. All the measurement models (scales) were validated in the peculiar Pakistani context. Data analysis result indicated that the Perceived Strategic Value of E-Commerce (PSVEC) and Personal Innovativeness in E-Commerce are statistically significant predictors of Intention to adopt E-Commerce. Data also shows that most of the managers and decision-makers are aware of the potential strategic value of E-Commerce and that they support the implementation of E-Commerce. PIIT proved to be a statistically significant predictor of intention to adopt E-Commerce. Lu, Yao, and Yu (2005) also found a positive causal relationship between PIIT and adoption of internet services via mobile technology. However, its interaction effect on relations of determinants of PSVEC and intention to adopt E-Commerce could not be supported empirically. This is in line with the findings of Wijesundara and Xixiang (2018) when they studied the interaction effect of PIIT between the Perceived Usefulness (PU) and Intention to adopt Social Networking Sites. This means that while PIIT is a statistically significant predictor of intention to adopt E-Commerce, it does not moderate the relationship between the determinants of perceived strategic value of E-Commerce and intention to adopt E-Commerce. However, the researchers do realise the limitations of this research. The data was collected in health emergency (due to Covid 19) from a limited number of organisations. Another larger study in a relatively stable environment with more representation can further verify the findings of this study.

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