



Factors affecting small and medium enterprises (SMEs) continuance intention to adopt e-commerce in Jordan



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ABSTRACT

E-Commerce plays important roles in developed and developing countries. Many SMEs in developing countries could benefit enormously from e-commerce for their business activities. Despite the availability of both broadband communication and multiple internet service providers (ISPs), the adoption rate is still very low as compared to other developing nations in the region. Data was collected from manufacturing SMEs in Jordan, using a survey method. A total of 210 data was obtained from respondents. Data was analyzed using Smart PLS 3. It was found that both relative advantages and IT competency have an impact on Jordan manufacturing SMEs continuance intention to adopt e-commerce. These findings could help SMEs, owner/managers of SMEs, to take necessary action to ensure that their organizations will continue to use e-commerce in their daily business activities.

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1. Introduction

Electronic commerce defined by Turban et al. (2008) as the process of buying, selling, transferring, or exchanging products, services, and/or information through computer networks, principally the Internet. Adoption of electronic commerce offers a great opportunity for SMEs to gain many benefits to organizations such as: (i) improved productivity by creating new relationships through customer/supplier and other strategic partners (ii) improved cost saving in transaction costs, (iii) increases the speed of business, (iv) improved transaction efficiencies (v) access a wide range of markets. The adoption of e-commerce by SMEs manufacturers has been unexpectedly slow, although its importance has been recognized by the industry for a long time. Over the last decade, while many manufacturers have expressed an interest in incorporating e-commerce technology into their existing platforms, very little has actually continued to adopt e-commerce with high level.

However, many studies such as Al-Dmour and Al-Surkhi, (2012) and Alrousan (2015) argued that the diffusion and adoption of e-commerce by Jordanian SMEs are slower than and far behind larger

organizations. SMEs development of e-commerce is very important to Jordan's economic growth as e-commerce is considered as a significant component strategy to survive in the market as technology adoption, provides many great benefits for SMEs that makes them able to have the ultimate competitive advantage such as the ability to compete with larger organizations.

In this regards, there is a need to identify and critically examine significant factors that contribute to the sustainability of SMEs' business based on e-commerce in Jordan that allow its continuous growth despite the challenging competitive landscape. For SMEs specifically, the role of the Internet as an SME business strategy needs to be researched, particularly in strategic business development and the discovery of new business opportunities. It has been asserted that Internet technologies have entirely eased the way towards an electronic economy that enables innovative business tactics (Lecic-Cvetkovic et al., 2016; Ramayah et al., 2016). Therefore, this study aims to examine the state of use of e-commerce and factors that may affect e-commerce continuance intention in Jordanian SMEs.

2. Research model and hypothesis of this study

This research design mainly from the Technology-Organization-Environment (TOE) framework by Tornatzky and Fleischer (1990). TOE framework is consistent with Rogers' (2003) diffusion of innovation theory as it focuses on both

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internal and external characteristics of the organization, as well as technological characteristics in the study of drivers for new technology diffusion as shown by [Ahmed et al. \(2015\)](#). TOE framework can be combined with DOI theory. Five factors of DOI theory (Relative advantage, Compatibility, Complexity, Trialability, Observability) are used in the technological context to describe the adoption depends on the pool of technologies inside and outside the organizations. [Oliveira and Martins \(2010\)](#) argued that most empirical studies use the TOE framework of IT adoption on organization level, because it has a solid theoretical basis, consistent empirical support, and the potential for the application of IT adoption. So that most of the studies use DOI theory with the TOE framework to become better able to explain intra-firm innovation

adoption. Review of organizational technology adoption indicates that SMEs are likely to consider many factors when contemplating an e-commerce. In this study, the proposed model is built based on literature review. Four independent factors influence on dependent factor continuance intention to adopt e-commerce, see [Fig. 1](#). Literature review of IS studies by [Santhanamery and Ramayah \(2013\)](#) that defined continuance intention as “user’s intention to continue use or long term usage intention of technology in order to make sure that the technology is better from the previous one”. For this study continuance can be defined as the intention of continuing use of an organization e-commerce to share product information, contact with supplier and customers, and conduct business transactions through telecommunications networks.

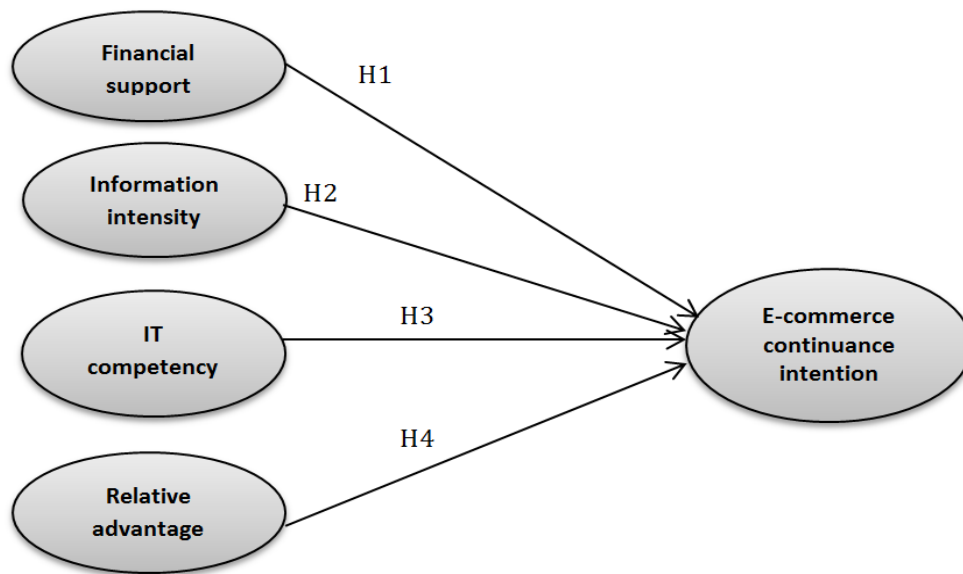


Fig. 1: Conceptual Research Framework

2.1. The relationship between financial support and e-commerce continuance intention

Financial support is an important factor for the adoption of different IS. The researchers [Bao and Sun \(2010\)](#), [Rowe et al. \(2012\)](#), [Ifindo \(2012\)](#) explained that the lack of financial resources place constraints on the e-commerce implementation effort and often lead to the slow adoption. The term of financial support in this research is defined as the financial level of IT infrastructure and IT Staff to implement and adopt e-commerce. [Thong \(2001\)](#) and [Zhu et al. \(2006\)](#) were found financial support is a significant key for IT adoption and supported positively the adoption.

To ensure success for e-commerce adoption, SMEs should provide adequate financial resources that will be used to purchase essential infrastructure, and to training current employees for using e-commerce technology. [Cosgun and Dogerlioglu \(2012\)](#) found financial support as major determined and have significant effects on e-commerce activities. Therefore, this study hypothesizes as:

H1: Financial support has a positive impact on e-commerce continuance intention

2.2. The relationship between information intensity and e-commerce continuance intention

[Thong \(1999\)](#), [Whittaker et al. \(2006\)](#) and [Mndzebele \(2012\)](#) illustrated the information intensity as “refers to the degree of information that is present in the product or service of an organization”. According to [Whittaker et al. \(2006\)](#), [Mndzebele \(2012\)](#) the information content of a product is the useful information within a product that is received and understood by the user of that product. [Whittaker et al. \(2006\)](#) shown that when there is enough information about a product, it is likely that the product will be adopted. Some product is difficult to explain the information about it and this can be very difficult to adopt e-commerce by organization. Because complicated information may lead to many difficulties that prevent the adoption. Literature reviews were found information intensity encourages innovation adoption. For example, [Al-Qirim \(2007\)](#) who investigated the impact of

information intensity on the adoption of e-commerce among SMEs in New Zealand found that the information intensity was influenced by the adoption of websites. Therefore, this study hypothesizes as:
H2: Information intensity has a positive impact on e-commerce continuance intention

2.3. The relationship between IT competency and e-commerce continuance intention

Literature reviews of different IS studies found IT competency as an important key for different IS adoption, because is based on IT infrastructure and resources offered by IT professionals. [Salwani et al. \(2009\)](#), [Khan et al. \(2010\)](#), [Oliveira and Martins \(2010\)](#) and [Wang et al. \(2010\)](#) all of these studies and more argued that IT competency is very important for adoption. IT professionals are understood as having the necessary knowledge and skills for implementing e-commerce applications, they can using it easier than the other ([Ifindo, 2012](#)). The term of IT competency in this research defined as the technological readiness that based on IT infrastructure, skills and knowledge offered by an IT professional. According to [Ratanapoophun and Lee \(2010\)](#) mentioned that IT competency has a significant effect on ICT adoption, also [Kuan and Chau \(2001\)](#) argued IT competency as significant and necessary to support the use of EDI for small firms in Hong Kong. Similar to [Zhu and Kraemer \(2005\)](#), [Zhu et al. \(2006\)](#) were founded IT competency as a significant adoption facilitator; to adopt e-businesses across countries. [Soares-Aguiar and Palma-Dos-Reis \(2008\)](#) were founded IT competency a significance of e-procurement systems adoption. Therefore, this study hypothesizes as:
H3: IT competency has a positive impact on e-commerce continuance intention

2.4. The relationship between relative advantage and e-commerce continuance intention

According to [Rogers \(2003\)](#), relative advantage is “the degree to which an innovation is perceived as being better than the idea it supersedes”. Rogers argued that the innovation adopters rely on the nature of innovation to determine the type of relative advantage in addition to the characteristics of the adopters themselves. Previous studies, for example, [Lu et al. \(2009\)](#), [Wang et al. \(2010\)](#), [Almoawi and Mahmood \(2011\)](#) found relative advantage as the best predictor of adoption of different technologies. The researchers explain the relative advantage of e-commerce is important, because it describes the amount of benefits and predicates an organization will be an experience for adopting or rejecting a new innovation or technology. Also [Elmazi et al. \(2011\)](#) determine that relative advantage is the rate level of management understanding of the benefit of e-commerce can provide to the organization. Different literature reviews founded relative advantage is significant to adopt IS studies such as [Looi \(2005\)](#), [Al-Qirim](#)

[\(2007\)](#), [Hussin et al. \(2008\)](#), [Ramadani et al. \(2009\)](#) and [Wang et al. \(2010\)](#). Most of IS adoption researchers have shown that the relative advantage is positively related to the adoption decision. [Ramayah et al. \(2016\)](#) mentioned that relative advantage has a significant effect on website continuance intention in Malaysian SMEs. [Sin et al. \(2016\)](#) founded relative advantage influence towards implementation of e-commerce among SMEs.

Therefore, this study hypothesizes as:

H4: Relative advantage has a positive impact on e-commerce continuance intention

3. Methodology

This study used simple random sampling procedure to select a sample that represents the entire population. According to [Kenneth et al. \(2012\)](#), a simple random sample is used when a population is heterogeneous, making it the most appropriate sample to come up with the target sample. In this study the manufacturing SMEs is selected, because Manufacturing SMEs plays an important role in economic growth in Jordan, and the gross domestic product amounted (GDP) to about 24% manufacturing sector in Jordan. Also during the first three quarters of the year 2014 to be the second largest economic sector after sector services and 25% of the total Jordanian national product. Data were collected from SMEs that have at least (email or website) and intended to continue using e-commerce. Self-administered questionnaire, which was sent personally by the researcher to the respondents to gain more. The returned data that used is 210 samples. [Sekaran and Bougie \(2016\)](#) argued that sample size that is larger than 30 and less 500 are appropriate for most research, so the sample size is acceptable for this study. All the variables and the question items were adapted from literature reviews and were modified to match the objective of this study. Some major scale items are based on different degrees via the 7-point Likert-scale being utilized for all the responses with 1=Strongly disagree, 2= Disagree, 3= Slightly disagree, 4=Neither agree or disagree, 5= Slightly agree, 6= agree, 7=Strongly agree.

4. Result

The software SmartPLS 3 was used by [Ringle et al. \(2015\)](#) for the data analysis. The data were analyzed in two steps:

4.1. Measurement model

First, the convergent validity was examined. Average Variance Extracted (AVE) is a method used to estimate the convergent validity. The AVE must exceed than 0.5 to gain an acceptable convergent validity. Composite reliability (CR) must be 0.7 or above is deemed to be acceptable. Main loading

should be 0.7 (Hair et al., 2014). Based on result on Table 1, indicators loading for all items exceeded the recommended value of 0.5 suggested (Hair et al., 2014), but three items (FS1, IT4, ITC2) were deleted due to low factor loading. AVE were in the range of

0.745 to 0.874, which exceeded the recommended value greater than 0.50, and the CR ranged from 0.931 to 0.965, which exceeded the recommended value of 0.7 recommended by Hair et al. (2014). Table 1 shows the results of measurement model.

Table 1: Goodness-of-fit measurement model (n=210)

Latent variable	Question Items	Loading	AVE	Composite Reliability (CR)
CI	CI1	0.931	0.873	0.965
	CI2	0.937		
	CI3	0.945		
	CI4	0.924		
	FS2	0.943		
	FS3	0.961		
	FS4	0.950		
II	II1	0.952	0.818	0.931
	II2	0.825		
	II3	0.932		
ITC	ITC1	0.962	0.874	0.954
	ITC3	0.871		
	ITC4	0.968		
RA	RA1	0.875	0.745	0.936
	RA2	0.831		
	RA3	0.887		
	RA4	0.900		
	RA5	0.818		

Second, Discriminant validity is tested by means of assessment like Fornell Larcker, Cross loadings and the Heterotrait-monotrait ratio (HTMT). Fornell and Larcker (1981) mentioned that discriminant validity, is the square root of the AVE when

compared against the correlations of the other constructs, if the AVE extracted is greater than its correlations with all the other constructs then discriminant validity has been established, see Table 2.

Table 2: Fornell-larcker criterion (n=210)

	CI	FS	II	ITC	RA
CI	0.934				
FS	0.235	0.951			
II	-0.091	0.220	0.905		
ITC	0.323	0.299	0.070	0.935	
RA	0.523	0.385	-0.056	0.340	0.863

Note: Values in the diagonal (bolded) represent the square root of the AVE while the off-diagonals are correlations

As shown in Table 2, this study presents that the square root of AVEs is greater in all cases than the off-diagonal elements in their corresponding row and column, so that the required discriminant validity by Fornell-larcker has been achieved. As noted in SmartPLS2 documentation, although examination of cross-loadings and use of the Fornell-Larcker criterion is accepted methods for assessing the discriminant validity of a PLS model, these methods have shortcomings. Henseler et al. (2015) used simulation studies to demonstrate that lack of discriminant validity is better detected by the heterotrait-monotrait (HTMT) ratio, they developed, and this method is used in Smart PLS3.

The HTMT ratio is the geometric mean of the heterotrait-heteromethod correlations (i.e. the correlations of indicators across constructs).

Measuring different phenomena divided by the average of the monotrait-heteromethod correlations (i.e. the correlations of indicators within the same construct). Averaging using the geometric mean is necessary because there are two monotrait-heteromethod submatrices (sets of within-construct correlations), for example, when there are two

constructs. According to Garson (2016), a well-fitting model, heterotrait correlations should be smaller than monotrait correlations, meaning that the HTMT ratio should be below 1.0, indicate a lack of discriminant validity. As shown on Table 3, the threshold value is considered close to 0.85. The constructs in the study satisfy the discriminant validity assessment on the basis of HTMT.

Table 3: Heterotrait-monotrait ratio (HTMT) (n=210)

	CI	FS	II	ITC	RA
CI					
FS	0.246				
II	0.078	0.270			
ITC	0.342	0.320	0.123		
RA	0.546	0.405	0.084	0.370	

4.2. Assessment of structural model

The structural model provides the relationship between latent variables in the research model. The following criteria facilitate this assessment: Coefficient of determination (R^2), cross-validated redundancy (Q^2), and path coefficients (Hair et al., 2014). Table 4 shown the path coefficient of items.

Table 4: Significance result of path coefficients (n=210)

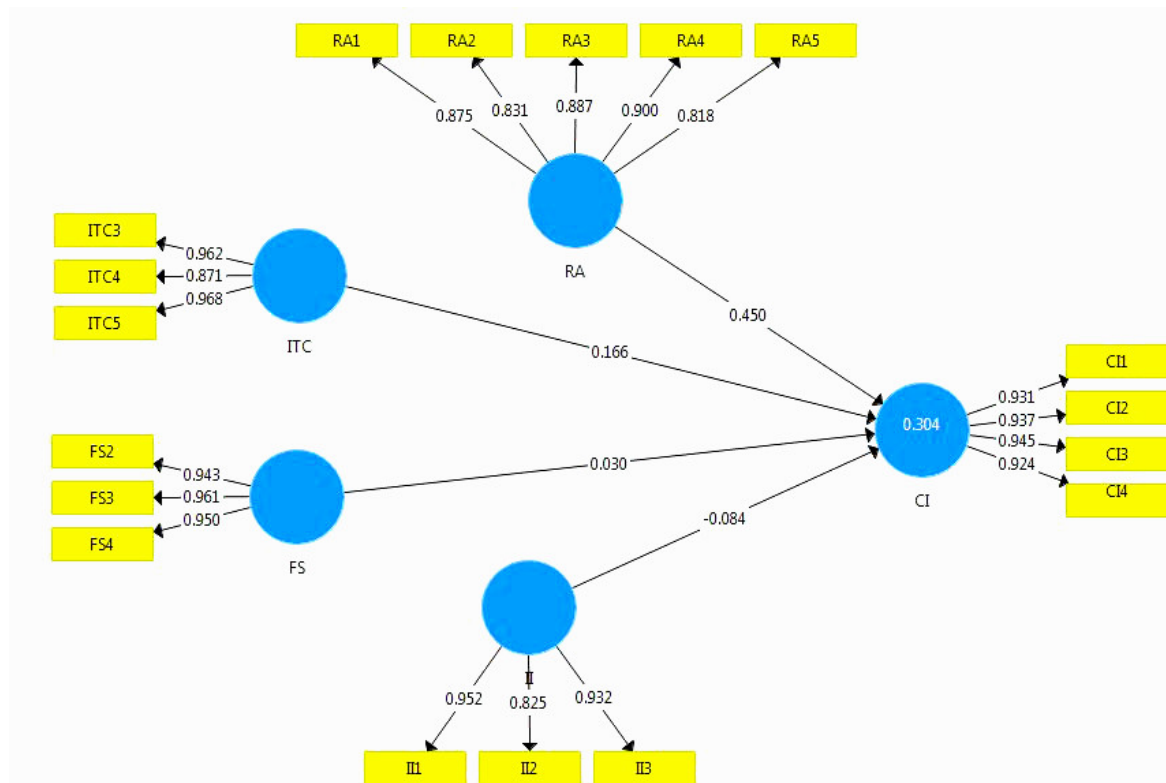
Hypothesis	Relationship	Beta value	Sample Mean	Std. Error	t-value	P Values
H1	FS -> CI	0.030	0.029	0.067	0.453	0.325
H2	II -> CI	-0.084	-0.092	0.068	1.236	0.109
H3	ITC -> CI	0.166	0.166	0.052	3.211**	0.001
H4	RA -> CI	0.450	0.459	0.066	6.812***	0.000

Note: *p<0.05, **p<0.01, ***p<0.001

The result shown the positive relationship of IT competency on e-commerce continuance intention with $\beta=0.166$ and significant with t-value= 3.211 and $p<0.01$, also a positive relationship of relative advantage of e-commerce continuance intention

with $\beta=0.450$ and significant with t-value= 6.812 and $p<0.001$.

As shown in Fig. 2 R^2 value for website continuance intention is 0.304 suggesting that 30.4% of the variance in e-commerce continuance intention can be explained by the SMEs'.

**Fig. 2:** PLS-Path diagram (n=210)

According to Ramayah et al. (2016), predictive sample reuse technique, popularly known as the Stone-Geisser's Q^2 , can be applied as a criterion for predictive relevance besides looking at the magnitude of the R^2 . Henseler et al. (2009) also utilized this measure to assess the research model's capability to predict. Based on the blindfolding procedure as presented by Hair et al. (2014), Q^2 evaluates the predictive validity of a model via PLS. Q^2 values larger than zero indicate that the exogenous constructs have predictive relevance for the endogenous construct. Fig. 3, shown Q^2 for e-commerce continuance intention ($=0.247$), that mean the research model has good predictive relevance.

Finally, Table 5 shown the summary of hypothesis, that IT competency and relative advantage are supported in this study, otherwise financial support and information intensity are not supported.

5. Discussion

The result of the study is used to answer the question about the factors that effect on e-commerce continuance intention by SMEs in Jordan. There are four independent variables: Relative advantage, financial support, IT competency and information intensity used to investigate the relationship with e-commerce continuance intention. Among these four variables, two variables are not significant: financial support and information intensity, and another two variables: Relative advantage and IT competency are significant. Relative advantage is the most significant factor that affects e-commerce continuance intention. This similar to the previous studies such as Alam et al. (2011) and Ahmed et al. (2015) suggested when e-commerce as perceived relative advantage as being better than the idea it supersedes, and beneficial to SMEs, its adoption is more likely.

Relative advantage is benefited by SMEs overall reducing costs, expand global market and improve public relations to improve the image as presented by Alam et al. (2011). Also Ramayah et al. (2016) found relative advantage is a significant factor on website continuance intention in Malaysian SMEs, the researchers mentioned that the perceived relative advantage of having an online presence, the greater the website continuance intention is in SMEs. Sin et al. (2016) mentioned that relative advantage of E-commerce is not only to increase sales, global market share, reduced costs, exploit new business

prospects but also will improve relationships with dealers and companion. IT competency is another significant factor that has a positive effect on e-commerce continuance intention, similar to previous studies that undertaken e-commerce, such as Salwani et al. (2009).

Table 5: Summary of hypothesis analysis (n=210)

Hypotheses		Results
H ₁	FS -> CI	Not Supported
H ₂	II -> CI	Not Supported
H ₃	ITC -> CI	Supported
H ₄	RA -> CI	Supported

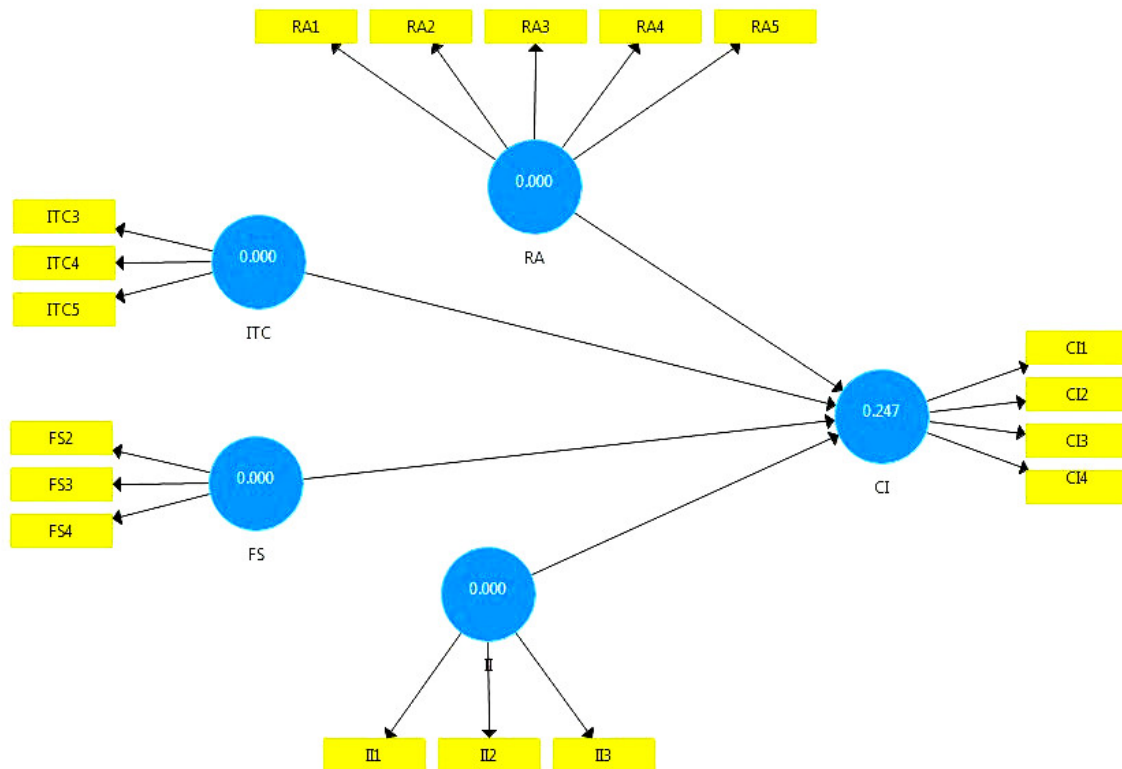


Fig. 3: Blindfolding model (DV)

Also, different IS studies were found IT competency as an important key for different IS adoption, because is based on IT infrastructure and resources offered by IT professionals Zhu and Kraemer (2005), Zhu et al. (2006), Oliveira and Martins (2010) and Wang et al. (2010). All of these studies and more argued that IT competency is very important for adoption, because of e-commerce continuance is necessary for IT infrastructure to understand installed network technologies for e-commerce, and IT professionals to understood as having the necessary knowledge and skills for implementing e-commerce applications. Financial resources and information intensity are two factors that have no significant effect for e-commerce continuance adoption in Jordan. This study for financial support is similar to which found financial support Tan and Eze (2008) and Ghobakhloo et al. (2011) insignificant. This is might be financial resources may be important for SMEs that want to start use of internet and buy a laptop or PC, however it is at the implementation stage of e-commerce

adoption where the organization seeks the availability of necessary funds and expertise.

Different studies found information intensity not significant effect on the e-commerce adoption and different IS studies such as Al-Qirim (2007), Al-Qahtani and Wamba (2012). This may be explained according to early studies on IT adoption suggest that sectors operating in information-intensive environments (e.g. financial services) are more likely to adopt IT innovations (Yap, 1990).

6. Conclusion

This study builds upon prior research studies, but is different in importance in a way that it analyzes factors that may influence e-commerce continuance intention by Jordanian SMEs. For this purpose, a sample of 210 SMEs in the Jordan was investigated. The research was done based on the TOE framework that was developed based on previous studies. Four factors that were driving of e-commerce continuance intention were identified through the use of Smart PLS3. The finding shows that relative advantage, IT

competency statistically significant factors of e-commerce continuance intention. On the other hand, financial support and information intensity did not seem to influence of e-commerce. The empirical data can be used to extend the body of knowledge for adoption & diffusion research in developing countries, particularly in Jordan. In general, the study provides more understanding of owner's/managers' of SMEs perceptions about e-commerce continuance intention in their businesses.

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