

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/350561785>

# A Modified Technology Acceptance Theory to Assess Social Commerce Technology Adoption

Article in *Information Resources Management Journal* · April 2021

DOI: 10.4018/IRMJ.2021040103

---

CITATION

1

READS

107

1 author:



[Alaa M. Momani](#)

Skyline University College

23 PUBLICATIONS 178 CITATIONS

[SEE PROFILE](#)


Some of the authors of this publication are also working on these related projects:



TAUSC Model [View project](#)

# A Modified Technology Acceptance Theory to Assess Social Commerce Technology Adoption

Alaa M. Momani, School of Information Technology, Skyline University College, UAE

 <https://orcid.org/0000-0002-6764-6186>

## ABSTRACT

User acceptance and satisfaction are important factors when evaluating any technology. This paper investigates the key determinants that drive the adoption of social commerce within the Jordanian community. A modification to the Theory Of Acceptance And Use Of Technology was empirically validated by applying a quantitative survey questionnaire. Several statistical techniques were utilized to examine the modified model. The modified model showed that performance expectancy, effort expectancy, social influence, and enjoyment expectancy are significant influencers of behavioral intentions. Facilitating conditions and behavioral intentions also significantly influence the actual use behavior of social commerce by the Jordanian community sampled. The results indicated that the four proposed moderating variables affect the relation between the expectancy variables and the behavioral variables.

## KEYWORDS

Behavioral Intentions, Online Shopping, Social Commerce, Social Media, Technology Acceptance, Technology Adoption, Usage Behavior, UTAUT

## 1. INTRODUCTION

Nowadays, social media is becoming a part of our lifestyle. Social commerce (s-commerce), as one of the newest electronic commerce (e-commerce) applications over the social media, is starting to attract the attention of researchers and numerous studies have been carried out, covering s-commerce from different perspectives (Huang and Benyoucef, 2013; Liang et al., 2011). It is different from the traditional e-commerce in many factors and it has many different characteristics, too. Actually, the introduction of Web 2.0 and the social networking applications enabled s-commerce to emerge as a new type of e-commerce (Momani et al., 2018). S-commerce represents the benefiting from the social networks to enhance the e-commerce by adopting some new activities to the online shopping process, in order to make it more social and acceptable by users (Gatautis and Medziausiene, 2014). S-commerce seems to be an enjoyable alternative to the traditional way of online shopping, because of the revolutionary communicating features offered to the consumers. As mentioned by Momani et al.

DOI: 10.4018/IRMJ.2021040103

(2017), social media communication and interaction tools make the online shopping more enjoyable, and as a result, it will increase the level of acceptance, as well as, the satisfaction of the process.

Therefore, the up growing problem is that this acceptance needs to be assessed in order to explore and evaluate the degree of consumers' acceptance and satisfaction to this new technology. The proposed solution is to apply one of the technology acceptance theories in order to assess the ability for the proposed research population (Jordanians) to adopt such kind of technology (s-commerce) within their usage behavior (online shopping). Actually, this field of software engineering has a long history and strong relation with the psychological and sociological sciences since the beginning of the twentieth century (Momani and Jamous, 2017). This study aims to investigate the ability of the Jordanian society to adopt s-commerce and their acceptance of using their social media accounts to perform their online shopping activities. Accordingly, this research revised the unified theory of acceptance and use of technology (UTAUT), as one of the most developed and intensive technology acceptance theories (Momani, 2020).

In general, the majority of the technology acceptance theories and models in their original frameworks did not design for this kind of technologies, because these theories were designed originally to explain the usage behavior and assess the acceptance of adopting information systems in organizations within the mandatory style of usage, while s-commerce is a web-based, social-commercial, and voluntary-usage application. UTAUT model was developed to test the acceptance of applying new technologies in organizations and firms within a mandatory style of usage depending on western working environment and culture (Venkatesh et al., 2003). It is worth to mention here that UTAUT model got a revision and update by its developers in the form of the extended UTAUT (UTAUT2) (Venkatesh et al., 2012). While the UTAUT2 seems to be more applicable to study this kind of technologies, one of the contributions of this study is investigate and examine the UTAUT model in context of voluntary style of usage and its viability after extension and modification. As mentioned by Venkatesh et al. (2012), UTAUT2 can explain from 52% to 74% of the variance in behavioral intention an usage behavior. This study would examine the applity of the UTAUT in the same condition.

The purpose of this study is to examine the ability of the UTAUT model to be applied over a social and commercial application within a voluntary style of usage for a non-western culture, such as the Jordanian society, whereas 34.1% of the society having their own accounts on Facebook (ASMR, 2012), which is the most common social network within the Jordanians. This requires the necessity to study the Jordanian consumers' behaviors and their needs depending on their culture, in addition to their ability to adopt this kind of development on the typical e-commercial way that they already know. It is important to know that this research is possible to be circulated over any Arab, Middle-eastern, or developing country which all share almost the same features in their needs and online shopping behaviors.

Accordingly, this study would modify the UTUAT model by adding some new factors and removing some others and redefining the relations between these factors. That will make it more suitable to test the acceptance of s-commerce adoption within the Jordanians depending on their behavioral intention and usage behavior of online shopping by using their accounts on social networks.

## **2. LITERATURE REVIEW**

### **2.1. The Unified Theory of Acceptance and Use of Technology (UTAUT)**

The research study that was done by Venkatesh et al. (2003) aimed to define a unified form of technology acceptance theories. Therefore, UTAUT model becomes one of the most integrated and developed technology acceptance theories by adopting the most advantage constructs from other older theories and models. The authors tested a total number of 32 constructs stated in the most important and widely used eight technology acceptance theories and models (Momani, 2017). They examined

all the common characteristics and hypothesized four of them as the most significant and direct effect on behavioral intention and usage behavior. These constructs were: Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC). The researchers, also, studied the effect of the moderating variables of the eight theories on the decision of information technology usage, and summarized them in four moderators as follows: gender, age, experience, and voluntariness of use. They noted that the predictive validity of the theories was increased after including the moderating variables to the majority of the examined theories. As a result, the UTAUT model assumed that there are three direct determinants of behavioral intention, which are: performance expectancy, effort expectancy, and social influence. In addition to two direct determinants of usage behavior, which are: intention of use and facilitating conditions.

This study offers a new conceptual framework to the UTAUT model that incorporates the unique characteristics of s-commerce to enhance the understanding for its acceptance and usage within the proposed research population. The proposed modification is done over the concept of the original model with some modifications on its determinants and moderators. These modifications are presented in the following three major points:

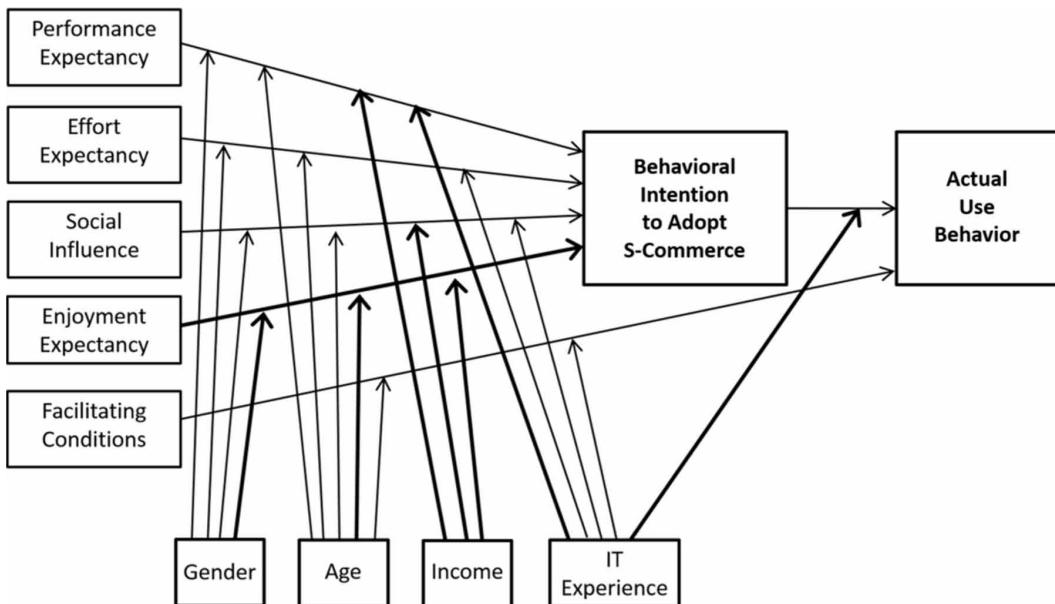
- In general, online shopping is a voluntary and hedonic activity. Individuals are participating because they are motivated. Consequently, the first modification is adding a new determinant to the model, which is the Enjoyment Expectancy (EN). Enjoyment expectancy is defined as the extent to which the activity of using a specific system is perceived to be enjoyable in its own right, aside from any performance consequences resulting from system use (Venkatesh, 2000) p 351. It is an important determinant for any social media application, because the enjoyment is one of the key reasons for using social media and choosing s-commerce.
- Any application, communication, commercial activity, or entertainment through the social media is voluntary by its nature. The decision to use any commercial application through social media is voluntary and hedonic activity, whether the intention of user was purchasing or only exploratory (Momani, 2018). Accordingly, the second modification would be done over the UTAUT model's moderating variables, which is the "voluntariness of use". It will be removed because it has a little impact on adopting any voluntary application, particularly s-commerce, too.
- This new modified model aims to assess the acceptance of a commercial application through the social media. Thus, the income factor would be an important addition to this modification, because the level of income is controlling the ability of purchasing for individuals. Therefore, the level of income will be added to the UTAUT structure as a moderating variable. It is proposed that it may have a significant effect on adopting s-commerce.

Depending on the previous modifications on the model, the modified UTAUT model proposed within this research is illustrated as a conceptual framework as shown in Figure 1, noting that the new relations are shown in bold arrows. The modified model assumes that there are four direct determinants of behavioral intention to use and adopt s-commerce: performance expectancy, effort expectancy, social influence, and enjoyment expectancy. In addition to two direct determinants of actual use behavior: facilitating conditions and the behavioral intention to use.

## 2.2. Social Commerce

The term social commerce was introduced for the first time by (Yahoo!) in November 2005 to describe set of online collaborative shopping tools such as shared pick lists, user ratings, and other user-generated content-sharing of online product information (Kwahk and Ge, 2012; Wang and Zhang, 2012). S-commerce is considered as the latest innovation in e-commerce field by combining online social networking with online shopping (Shen, 2007). It is a new stream in e-commerce, presented recently from the development of information and communication technologies (ICTs), Web 2.0 technology, and cloud technology. Actually, the evolution of Web 2.0 technology and the introduction

Figure 1. The modified UTAUT model proposed within this research



of wikis, blogs, communities, and social networks, have dramatically changed the structure of the web (Hajli, 2013; Ling and Turban, 2008). Some authors like Leitner and Grechenig (2007) and Liang et al. (2011) believe that s-commerce is affected by the expansion of social networks.

The acceptance and adoption of s-commerce has been studied in several research works by researchers from different cultures. Shen and Eder (2011) examined the factors that influence the user acceptance of social shopping websites which are designed specifically to support social interactions with shoppers. Their study utilized the technology acceptance model (TAM) with specific constructs that may enhance the power of the model to predict the user acceptance of social shopping application of s-commerce, including social comparison, social engagement, enjoyment, perceived ease of use, and perceived usefulness. Their model was empirically tested, and the results provided strong support. According to the study of Shen (2012), the online consumers' behaviors are categorized into three types: transactional, informational, and social. This study explained that the traditional e-commerce supports the transactional and informational aspects of online shopping, while social commerce fulfils the social aspects of shopping, and potentially enhances the informational aspect as well. The author used TAM by augmenting it with constructs that enhance its application over the social shopping and social commerce. This model was tested empirically, and it was supported. The results showed the importance of distinguishing the social aspect of shopping from the informational and transactional aspects.

Additional employment of TAM on s-commerce adoption was done by Teh and Ahmed (2012). The researchers investigated the influence of perceived ease of use, perceived usefulness, and trust on behavioral intention of Malaysian s-commerce users. The researchers tested the model by 220 s-commerce users and their results showed that the trust factor has four major determinants: security, situational normality, vendor familiarity, and structural assurance. Moreover, the behavioral intention to use social commerce is built through user trust (Oh and Yoon, 2014; Rondán-Cataluña et al., 2015).

Assessment of the largest 500 of the U.S. companies' strategic use of social media for e-commerce was done by Zhao et al. (2013). The data collection and analysis of the sample was sourced by the web content analysis. Their findings showed that the total of seven popular social media tools were available only on around 50% of the 217 sites for B2C and C2C online interaction, communication,

networking, and collaboration. While less than 50% of the consumers were using social media tools for posting ideas and comments. The authors noted that companies have to consider and develop more social media tools, and motivate consumers to actively communicate with them by using these tools.

The study of Gatautis and Medziausiene (2014) aimed to address the users' acceptance for s-commerce in Lithuania by identifying various factors affecting the attitudes towards its adoption. The researchers reviewed the Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), and TAM, and utilized the constructs of UTAUT for their assessment. The factor of perceived enjoyment was reviewed too. Their proposed model was empirically tested over a sample of the Facebook users. Their results showed that the social influence has the most significant effect on the behavioral intention towards social commerce acceptance, a medium effect for the effort expectancy, while performance expectancy and facilitating condition have the lowest impact on the behavioral intention towards social commerce acceptance. From a different perspective, a study on 300 active s-commerce users who were surveyed by Kim et al. (2014) showed that the consumers blamed both the s-commerce companies and merchants. This feeling of regret and disappointment led to dissatisfaction. Alshibly (2014) theoretically addressed and empirically examined the customers' satisfaction to s-commerce. A group of 136 participants were tested to evaluate two s-commerce websites in order to measure the relationships among s-commerce website quality, customer psychological empowerment, and customers' satisfaction. The results showed that the customers' satisfaction is correlated with the sites quality and customer psychological empowerment. Recently, in the study of Biucky et al. (2017), they examined the effect of perceived risk on the adoption of s-commerce. The researchers developed the TAM model by taking into account the different types of risks, including financial, functional, social, time, psychological, and privacy risks. The results of their study showed that the perceived risk has a significant impact on the perceived usefulness of s-commerce.

From a different perspective, the study of Roh et al. (2017) investigated the interrelation between customers trust, their satisfaction, and company performance in s-commerce, and focused on delivery performance and trust for s-commerce sites. The researchers concluded that the significance of a well-equipped shipping process and delivery system, including speed and accuracy, as well as, employee kindness, will increase the acceptance and satisfaction of s-commerce, as well. Beyari and Abareshi (2018) in their research work aimed to explore the relationships that affect the consumer satisfaction in relation to s-commerce. Their results showed that trust and social influence have a significant association with consumer satisfaction and a strong impact of the Word of Mouth variable on them. The researchers mentioned that even though s-commerce is a facet of e-commerce, the factors which impact consumer satisfaction in s-commerce settings, might not be the same as the ones which impact consumer satisfaction in either e-commerce or traditional commerce (Beyari and Abareshi, 2018).

### **3. RESEARCH METHODOLOGY**

#### **3.1. Research Hypotheses**

The research hypotheses have been divided into two levels. The first level of hypotheses presents the relations between the model's constructs with the behavioral intentions and actual use behavior. The second level is for the effects of the moderators on the aforementioned relations. All hypotheses of this research have to be tested statistically depending on the quantitative research method. As explained before, the modified UTAUT model consists of five constructs and four moderators. The proposed hypotheses of this study are being discussed as follows:

##### **(1) Performance Expectancy (PE)**

It is defined as the degree to which an individual believes that using the system will help him/her to attain gains in job performance (Venkatesh et al., 2003) p 447. The related studies have shown that

the performance expectancy has a positive and significant relation with the behavioral intention (Davis, 1986; Davis et al., 1989; Venkatesh and Davis, 2000). This relation was proposed to be moderated by gender type, age segment, level of income, and level of experience in information technology (IT) usage. According to this, the following hypotheses were proposed:

- **H1:** *Performance expectancy* has an effect on *behavioral intention* to adopt s-commerce.
  - **H1a:** The influence of *performance expectancy* on behavioral intention to adopt s-commerce will be moderated by *gender*, such that the effect will be stronger for men.
  - **H1b:** The influence of *performance expectancy* on behavioral intention to adopt s-commerce will be moderated by *age*, such that the effect will be stronger for young users.
  - **H1c:** The influence of *performance expectancy* on behavioral intention to adopt s-commerce will be moderated by *income*, such that the effect will be stronger for users with high income.
  - **H1d:** The influence of *performance expectancy* on behavioral intention to adopt s-commerce will be moderated by *IT experience*, such that the effect will be stronger for users at the high stages of experience.

### (2) Effort Expectancy (EE):

It is the degree of ease associated with the use of the system (Venkatesh et al., 2003) p 450. The related studies have shown that the effort expectancy has a significant relation with the behavioral intention (Davis, 1986; Triandis, 1980; Venkatesh and Davis, 2000). It was proposed to be moderated by gender, age, and experience. According to this, the following hypotheses were proposed:

- **H2:** *Effort expectancy* has an effect on *behavioral intention* to adopt s-commerce.
  - **H2a:** *The influence of effort expectancy on behavioral intention to adopt s-commerce will be moderated by gender, such that the effect will be stronger for women.*
  - **H2b:** *The influence of effort expectancy on behavioral intention to adopt s-commerce will be moderated by age, such that the effect will be stronger for elderly users.*
  - **H2c:** *The influence of effort expectancy on behavioral intention to adopt s-commerce will be moderated by IT experience, such that the effect will be stronger for users at the early stages of experience.*

### (3) Social Influence (SI):

It is defined as: the degree to which an individual perceives that important others believe he/she should use the new system (Venkatesh et al., 2003) p 451. Its relation with the behavioral intention is proposed to be moderated by all of the four proposed moderators (gender, age, income, and experience). According to this, the following hypotheses were proposed:

- **H3:** *Social influence* has an effect on *behavioral intention* to adopt s-commerce.
  - **H3a:** *The influence of social influence on behavioral intention to adopt s-commerce will be moderated by gender, such that the effect will be stronger for women.*
  - **H3b:** *The influence of social influence on behavioral intention to adopt s-commerce will be moderated by age, such that the effect will be stronger for elderly users.*
  - **H3c:** *The influence of social influence on behavioral intention to adopt s-commerce will be moderated by income, such that the effect will be stronger for users with high income.*
  - **H3d:** *The influence of social influence on behavioral intention to adopt s-commerce will be moderated by IT experience, such that the effect will be stronger for users at the early stages of experience.*

#### (4) Enjoyment Expectancy (EN):

According to Davis, Bagozzi, and Warshaw (Davis et al., 1992), the enjoyment expectancy is the extent to which the activity of using a certain technology is perceived as being enjoyable. Depending on the proposed framework of the modified UTAUT model which developed within this study, enjoyment expectancy is proposed as a direct determinant of behavioral intention. The effect of enjoyment expectancy on behavioral intention to adopt s-commerce is proposed that it is moderated by gender, age, and income (Momani et al., 2018). According to this, the following hypotheses were proposed:

- **H4:** *Enjoyment expectancy* has an effect on *behavioral intention* to adopt s-commerce.
  - **H4a:** *The influence of enjoyment expectancy on behavioral intention to adopt s-commerce will be moderated by gender, such that the effect will be stronger for women.*
  - **H4b:** *The influence of enjoyment expectancy on behavioral intention to adopt s-commerce will be moderated by age, such that the effect will be stronger for young users.*
  - **H4c:** *The influence of enjoyment expectancy on behavioral intention to adopt s-commerce will be moderated by income, such that the effect will be stronger for users with high income.*

#### (5) Facilitating Conditions (FC):

It is defined as: the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system (Venkatesh et al., 2003) p 453. Facilitating conditions proposed by the related researches denotes that it has no significant effect on the behavioral intention. It has a positive influence on the usage behavior (Ajzen, 1985; Rogers, 1983, 2003; Taylor and A., 1995; Taylor and Todd, 1995a; Triandis, 1980). The proposed modification assumed that its relation with the actual use behavior is moderated by age and experience. For this, the following hypotheses were proposed:

- **H5:** *Facilitating conditions* has an effect on *actual use behavior* of s-commerce.
  - **H5a:** *The influence of facilitating conditions on actual use behavior of s-commerce will be moderated by age, such that the effect will be stronger for young users.*
  - **H5d:** *The influence of facilitating conditions on actual use behavior of s-commerce will be moderated by IT experience, such that the effect will be stronger for users at the high stages of experience.*

#### (6) Behavioral Intention (BI):

It is the degree to which a person has formulated conscious plans to perform or not perform some specified future behavior (Venkatesh et al., 2003). The related studies have shown that it has a direct relation with usage behavior (Ajzen, 1985; Ajzen and Fishbein, 1980; Davis et al., 1989; Taylor and A., 1995; Taylor and Todd, 1995b, 1995a; Venkatesh and Davis, 2000). The modified model proposed that this relation is moderated by the level of user's experience. According to this, the following hypotheses were proposed:

- **H6:** *Behavioral intention* to adopt s-commerce has an effect on *actual use behavior* of s-commerce.
  - **H6a:** *The influence of behavioral intention on actual use behavior of s-commerce will be moderated by IT experience, such that the effect will be stronger for users at the high stages of experience.*



### 3.2. Questionnaire Design

The survey questionnaire related to this study has been designed electronically by using the Google Forms tool to be more accessible to participants at any time and everywhere. All questions were designed as required questions without any exceptions. This means that the participant must answer all questions specified in the current part of the questionnaire before moving to next part. This technique helps in getting rid of the missing data problem, and as a result, it will give more reliable findings. It is important to mention here that each construct of the modified model is examined by four statements in the questionnaire. The participant has to give his/her opinion about his/her status for each statement from the twenty-four statements presenting the s-commerce adoption acceptance test. Appendix A provides the testing statements for each one of the five constructs, in addition to the behavioral intention factor.

### 3.3. Research Sample and Data Collection

The research population of this study is the actual users of social media within the Jordanian society who are interested in selling and buying over the internet by using their own accounts on the social networks regardless of their career area that would enhance the generalizability of the research results.

The best way to define the sample size is to calculate it mathematically. This study adopted Steve Thompson's equation for estimating the sample size (Thompson, 2012; Vincent and Thompson, 2014). This equation depends on calculating the sample size according to the population of the society ( $N$ ). It is worth to know here that Jordan's population is around 9.5 million depending on the latest report of the general census of population and housing in Jordan for the year 2018 which has been done by the department of statistics in Jordan (DOS, 2018). Furthermore, Steve Thompson's equation depends on some statistical values, such as: the normal distribution value ( $p$ ),  $z$ -score for the confidence interval ( $z$ ), and the margin of error assumed by the researcher himself ( $e$ ). The Steve Thompson's equation used in this study is presented as below:

$$n = \frac{N \times p(1-p)}{\left[ \left[ (N-1) \times (e^2 \div z^2) \right] + p(1-p) \right]} \quad (1)$$

In order to solve this equation, it was assumed that  $N = 9,500,000$ ,  $p = 50\%$ ,  $z$ -score = 1.65 for a 90% confidence interval, and  $e = 5\%$ . Then, after calculation, the result was:  $n = 272,242$ . The sample size at least of 273 usable responses is the target set for this study, taking into consideration, the model complexity and the guidelines of researchers for applying surveys to study the technology acceptance. Actually, a total of 282 questionnaires were collected as a primary data for this study.

## 4. EXPERIMENT AND RESULTS

### 4.1. Reliability Test

Reliability analysis is an important step in any statistical analysis. It is the degree of accuracy of collected data and the consistency of measurements. For this study, the most popular technique was used for testing the reliability which is the Cronbach's coefficient alpha ( $\alpha$ ) that is used for multipoint-scaled items (Field, 2009; Kline, 2011; Pallant, 2005). Cronbach's coefficient alpha tests the consistency of respondents' answers to all items of a measure (Cortina, 1993). As mentioned by Marchewka et al. (2007) and Hair et al. (2009), Cronbach's  $\alpha$  values close to 1.0 are excellent reliability, over 0.8 are good, in the range of 0.7 are acceptable, and below 0.6 are considered to be poor. In exploratory researches, the acceptable value is probable to be decreased to 0.6. Accordingly, by using SPSS statistical package, and as shown in Table 1, all Cronbach's  $\alpha$  values of each variable

in this study are above 0.7, and from the acceptable to the excellent level of reliability. These results indicate that the statements of each measurement item were positively correlated to one another, and they are independent measures for the measurement item.

For other evidence to the questionnaire reliability, another measure can be used to assess the internal consistency, which is the inter-item correlation. Inter-item measurement measures the correlation among statements for each item (Hair et al., 2009). The correlation value from 0.10 to 0.29 is considered to be small correlation, from 0.30 to 0.49 is considered as a medium correlation, and from 0.50 to 1.0 is large correlation. All these considerations are for both positive and negative correlations. Hair et al. also determined the values of 0.3 and above are acceptable values for inter-item correlation. The inter-item correlations' values are represented in Table 1. It is clear that all the values are above 0.3. These results supported the results of Cronbach's Alpha. And as a result, these values suggest that the questionnaire was reliable research instrument and measurement tool.

#### 4.2. Validity Test

In order to test the validity of the research instrument, there are two main approaches to factor analysis, which are: exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) (Bacon, 1997; Suhr, 2005). EFA is a successful technique to assess the relationships among variables for exploring the construct validity of the instrument's scale. Herein, the AMOS statistical package was used to analyze the factor loading of the six scales of the proposed model. The items with values below 0.4 are considered to be low-loaded (Hair et al., 2009). Table 2 presents the loading values of all scales, and all of them are resulting values above the minimum value of factor loading.

For CFA, the Average Variance Extracted (AVE) should be used in order to test the convergent validity. AVE is used to calculate the explanatory power to all variables in the instrument of the average variation. The higher result of AVE means the higher reliability and the higher construct validity. According to Kline (2011), the appropriate value for AVE should be 0.5 and above. Byrne (2010) and Fornell and Larcker (1981) mentioned that the constructs have convergent validity when the composite reliability (CR) exceeds the value 0.7 and AVE is above 0.5. It is important to know that AMOS does not produce the values of CR and AVE. Thus, it can be calculated by the two equations below (Attuquayefio and Addo, 2014; Sekaran, 2003):

*Average Variance Extracted (AVE)*

$$= \frac{\sum_{i=1}^n \lambda_i^2}{n} \tag{2}$$

where:  $n$  = the total number of items, and  $\lambda_i$  = standardized factor loading.

**Table 1. Cronbach's alpha and inter-item correlations reliability results**

Measurement Items	No. of statements	Cronbach's $\alpha$	Inter-item Correlation
PE	4	0.864	0.539 – 0.722
EE	4	0.910	0.678 – 0.783
SI	4	0.705	0.311 – 0.459
EN	4	0.840	0.483 – 0.695
FC	4	0.843	0.500 – 0.714
BI	4	0.868	0.498 – 0.766

Table 2. Factor loading of the model's measurement scales

Constructs	Factor Loading			
	PE1	PE2	PE3	PE4
PE				
	0.732	0.790	0.848	0.826
EE				
	0.836	0.905	0.847	0.847
SI				
	0.797	0.761	0.832	0.866
EN				
	0.741	0.871	0.742	0.783
FC				
	0.764	0.729	0.837	0.796
BI				
	0.864	0.835	0.828	0.791

Composite Reliability (CR)

$$= \frac{\left(\sum_{i=1}^n \lambda_i\right)^2}{\left(\sum_{i=1}^n \lambda_i\right)^2 + \left(\sum_{i=1}^n \delta_i\right)} \quad (3)$$

where:  $n$  = total number of items,  $\lambda_i$  = standardized factor loading, and  $\delta_i$  = error variances.

After applying the two equations above for all constructs, the results of AVE and CR have been stated in Table 3. It is clearly shown that all values of AVE are exceeding the minimum limit of 0.5. Additionally, the CR values exceeding 0.7, which means that there is no overlap among the measures in this study. According to this, these results support the instrument's adequate convergent validity.

Discriminant validity is a part of construct validity. It is found when two different concepts are not correlated to each other. According to Fornell and Larcker (1981) and Hair et al. (2009), discriminant validity can be tested through the inter-factor correlations by comparing the square root of the AVE of each factor with the square values of inter-factor correlations of other factors. The square root AVE

Table 3. The results of AVE, CR, and the discriminant validity tests

Constructs	AVE	$\sqrt[2]{AVE}$	CR	PE	EE	SI	EN	FC	BI
PE	0.640	0.800	0.936	<b>0.800</b>					
EE	0.738	0.859	0.950	0.504	<b>0.859</b>				
SI	0.664	0.815	0.928	0.533	0.325	<b>0.815</b>			
EN	0.618	0.786	0.925	0.160	0.176	0.058	<b>0.786</b>		
FC	0.611	0.782	0.932	0.160	0.260	0.313	0.194	<b>0.782</b>	
BI	0.689	0.830	0.962	0.533	0.462	0.462	0.360	0.144	<b>0.830</b>

values should be greater than the square values of the correlations in order to satisfy discriminant validity requirements, and as a result, to be supported (Pallant, 2005; Sekaran, 2003). For this study, the discriminant validity results are presented in Table 3. These results showed that all square values of inter-factor correlations are less than the square root values of AVE (the diagonal cells). It means that the constructs confirm the adequacy of the discriminant validity.

### 4.3. Structural Equation Modelling (SEM)

The SEM is a general structural modelling technique which is widely used in behavioral sciences, especially in information technology researches. It describes the structural relationships among the constructs in the model (Hox and Bechger, 1998). Skrondal and Rabe-hesketh (2005) mentioned that SEM contains two types of models, the measurement model and structural model. Measurement model relates the observed responses to the latent variables. Structural model then specifies the relations between the latent variables and regressions of the latent variables on the observed variables in order to describe how the constructs are related to other constructs in the model (Awang, 2012).

The SEM analysis which is used in this study contained the following two major phases: (1) Investigating only the constructs and their influence on the behavior without considering the effect of the moderators. Two steps of analysis have been followed through this phase. The whole measurement model is used to assess the validity and unidimensionality of the model, and then the structural model is to test the relations among constructs. These two steps were applied herein by using AMOS statistical package. As a result of this phase, the research hypotheses are partly tested. (2) Investigating the effect of the moderators on the influence of the constructs on the behavior. This operation has been done by using multiple-group analysis by using AMOS too. The result obtained from this phase is the completely tested hypotheses, and consequently, the completely tested model.

#### (1) Measurement Model Assessment:

Hair et al. (2009) recommended using the goodness-of-fit (GOF) measures in order to evaluate the measurement model. Several tests were applied, and the results showed that the model is from acceptable to good level of fit with values as follows: Chi-square ( $\chi^2$ ) = 419.178, degree of freedom ( $df$ ) = 237, the relative Chi-square ( $\chi^2/df$ ) = 1.769, Comparative Fit Index (CFI) = 0.953, Tucker-Lewis Index (TLI) = 0.945, Incremental Fit Index (IFI) = 0.953, and Root Mean Square Error of Approximation (RMSEA) = 0.052. These tests are also recommended to be in use for evaluating the structural model, as well.

#### (2) Structural Model Assessment:

Within this step, the hypothesized model and its entire relations among constructs were evaluated. GOF tests were examined by using AMOS and the results were as follows:  $\chi^2 = 511.280$ ,  $df = 283$ ,  $\chi^2/df = 1.807$ , CFI = 0.946, TFI = 0.938, IFI = 0.947, RMSEA = 0.054. All results were in good level of fit, Chi-square ( $\chi^2$ ) was greater than the degree for freedom ( $df$ ), CFI, TFI, and IFI indices were above 0.90, finally, RMSEA was less than 0.80. Furthermore, the standardized coefficients were presented on the structural model in Figure 2 and Table 4, as well. It is clear that the whole factor loading values were in the acceptable range (above 0.30). Accordingly, these results showed a good level of fit to the model.

### 4.4. The Effect of The Moderators

As mentioned before, the second phase of SEM was to investigate the effect of the moderators on the influence of the constructs on the behavior intentions and usage behavior. The simultaneous multiple-group analysis was applied in order to test the moderators' effects. In multiple-group

Figure 2. The standardized path coefficients of the structural model

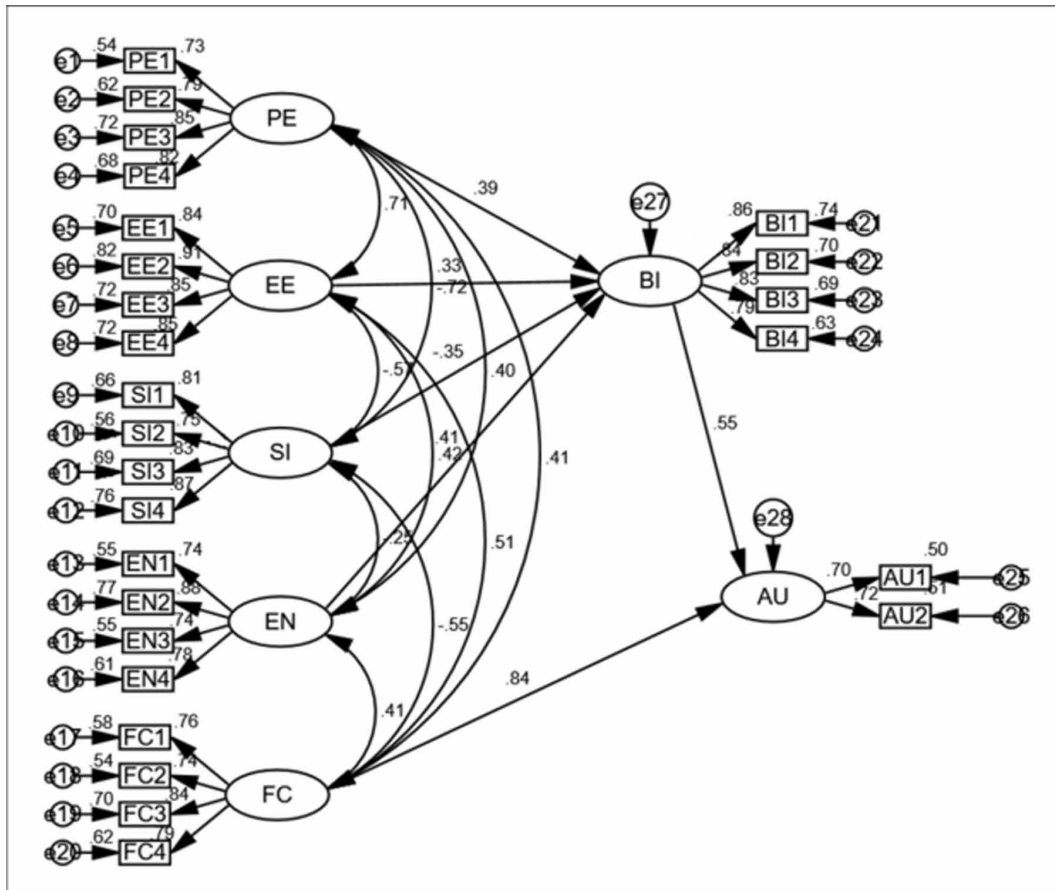


Table 4. The structural model assessment findings

Hypothesis	Path	Standardized path coefficient	Hypothesis testing result
H1	PE → BI	0.39 ***	Supported
H2	EE → BI	0.33 ***	Supported
H3	SI → BI	0.35 ***	Supported
H4	EN → BI	0.41 ***	Supported
H5	FC → AU	0.84 ***	Supported
H6	BI → AU	0.55 ***	Supported

*Note: \*\*\* p < 0.001*

analysis, the model is evaluated in two or more groups simultaneously (Arbuckle, 2013; Gorondutse and Hilman, 2014). AMOS was used to apply the multiple-group analysis here. This test was used to evaluate the invariance of the model depending on the data set. The next two steps were applied through this test:

1. Before applying the simultaneous group analysis, it is important to assess the fit of the model by checking the CFI and RMSEA values within each subgroup.
2. The simultaneous group analysis has to be applied in order to bring results stating that the moderators really affect and moderate the relations among the latent variables in the model. The Chi-square test was applied here. The change in the Chi-square value between the baseline and subsequent models was evaluated at 95% level of confidence. This step aims to test whether there are any statistical significant differences among the groups.

Table 5 presents the GOF tests of each moderator variable in both the baseline and constrained models depending on the influence of each moderator on the specific relations. Table 6 presents the results got from the hypotheses testing operation.

**Table 5. Simultaneous analysis results**

Moderator	Model	$\chi^2$	df	CFI	RMSEA	$\Delta \chi^2$	$\Delta df$
<b>Gender</b>	Baseline model	612.039	396	.905	.044		
	Fully constrained	699.040	417	.901	.049	87.000***	21
	PE to BI constrained	616.292	397	.905	.044	4.253*	1
	EE to BI constrained	613.904	397	.908	.044	1.865 <i>n.s.</i>	1
	SI to BI constrained	626.112	397	.909	.045	14.072***	1
	FC to AU constrained	617.652	397	.907	.044	5.613*	1
	BI to AU constrained	623.797	397	.910	.045	11.757***	1
<b>Age</b>	Baseline model	1393.434	852	.929	.048		
	Fully constrained	1532.405	900	.901	.050	138.971***	48
	PE to BI constrained	1406.581	854	.918	.048	13.147***	2
	EE to BI constrained	1399.926	854	.918	.048	6.492*	2
	SI to BI constrained	1404.525	854	.917	.048	11.091**	2
	EN to BI constrained	1397.286	854	.918	.048	3.852 <i>n.s.</i>	2
	FC to AU constrained	1419.570	854	.918	.049	26.136***	2
<b>Income</b>	Baseline model	478.786	294	.917	.047		
	Fully constrained	532.867	324	.906	.048	54.081*	30
	PE to BI constrained	480.376	296	.917	.047	1.590 <i>n.s.</i>	2
	SI to BI constrained	488.362	296	.917	.047	9.576**	2
	EN to BI constrained	485.378	296	.918	.047	6.592*	2
<b>Experience</b>	Baseline model	612.039	396	.905	.044		
	Fully constrained	699.040	417	.901	.049	87.000***	21
	PE to BI constrained	616.292	397	.905	.044	4.253*	1
	EE to BI constrained	613.904	397	.908	.044	1.865 <i>n.s.</i>	1
	SI to BI constrained	626.112	397	.909	.045	14.072***	1
	FC to AU constrained	617.652	397	.907	.044	5.613*	1
	BI to AU constrained	623.797	397	.910	.045	11.757***	1

Note: \*\*\*  $p < 0.001$ , \*\*  $p < 0.01$ , \*  $p < 0.05$ , *n.s.* not significant

Table 6. The summary of the hypotheses testing operation

Affecting Construct	Moderators	Affected Construct	Hypothesis		Hypothesis testing result
<b>PE</b>	Gender	Behavioral Intention (BI)	H1	H1a	Supported
	Age			H1b	Supported
	Income			H1c	Not supported
	Experience			H1d	Supported
<b>EE</b>	Gender		H2	H2a	Supported
	Age			H2b	Supported
	Experience			H2c	Not supported
<b>SI</b>	Gender		H3	H3a	Supported
	Age			H3b	Not supported
	Income			H3c	Supported
	Experience			H3d	Supported
<b>EN</b>	Gender		H4	H4a	Supported
	Age	H4b		Not supported	
	Income	H4c		Supported	
<b>FC</b>	Age	Actual Use (AU)	H5	H5a	Supported
	Experience			H5b	Supported
<b>BI</b>	Experience		H6	H6a	Supported

## 5. CONCLUSION

The major implication of this research work is to examine the ability of UTAUT model to be applied to study social/commercial applications within the voluntary style of usage. This research aimed through its statistical study to test the model’s viability to explain the acceptance and usage behavior for s-commerce in voluntary style of usage for non-western societies. The findings of the study which have been reached by utilizing SME reveal that the key predictors of the behavioral intentions and usage behavior to accept and adopt s-commerce within the Jordanians according to their culture and online shopping habits are: performance expectancy, effort expectancy, social influence, and enjoyment expectancy, all of them have significant influence on the behavioral intentions, while the facilitating conditions and the behavioral intention are significantly influencing the actual use behavior of s-commerce. These results supported the level-1 hypotheses (H1, H2, H3, H4, H5, and H6) without the effect of the moderators. These results indicate that the individuals believe that adopting s-commerce in their online shopping will help them to attain gains and improve the performance of the operation, which reflects the significant effect of the performance expectancy factor on adopting s-commerce. This is also due to the degree of ease of use and the familiarity of social media applications, then effort expectancy factor showed significant effect on adopting s-commerce. The results also reveal that the social influence is another significant factor on the adoption, with the effect of the society on individuals’ decision to use their social media accounts in their online shopping. Besides, no one denies the level of enjoyment which is offered by navigating social media applications, sharing individuals’ shopping activities and getting likes, comments, and suggestions on their online shopping activities. Accordingly, enjoyment expectancy factor shows a significant effect on the behavioral intention to adopt s-commerce among the research population studied through this article. On the other hand,

facilitating conditions which reflect the individuals believes that the organizational and technical infrastructure of social media applications exists to support their usage and adoption of s-commerce has a significant effect on the decision to adopt and continue use social media as a medium of their online shopping. That's done with the support of their behavioral intentions to adopt the technology which is supported already by the other aforementioned four factors.

The results of level-2 hypotheses testing operation according to SEM with the effect of the moderators showed strong statistical evidence on the validity of the modified UTAUT model of all constructs. The majority of moderation effects were supported, while a few effects were unsupported. The results showed that the effect of performance expectancy on behavioral intentions is moderated by gender, age, and experience, with insignificant effect for income. The effect of effort expectancy on the behavioral intentions is moderated by gender and age, with insignificant effect for experience. Gender, income, and experience moderate the relation between social influence and behavioral intentions, with insignificant effect for age. The relation between enjoyment expectancy and behavioral intentions is moderated by gender and income, with insignificant effect for age. Whereas, the actual use is affected by the facilitating conditions and is moderated by age and experience, and also the behavioral intentions that is moderated by experience, as already hypothesized.

It is important to mention that the squared multiple correlations (SMCs) of the model have been estimated in order to investigate how much the independent variables explain the variance of the dependent variables (Hox and Bechger, 1998; Nokelainen, 2009). As a result, the model has a power to explain 70% of the variance in behavioral intentions, which is very close to the original UTAUT model that was 69% (Venkatesh et al., 2003). Additionally, the modified UTAUT proves its adaptability and viability to be modified by comparing it with its extension, the UTAUT2 model, which shows an ability to explain from 56% to 74% of the variance in behavioral intention (Venkatesh et al., 2012).

Nevertheless, this study will not stop here. Many suggestions can be reported for the future research work that may be done by the researcher himself or by other researchers who are interesting in this field of software engineering and technology acceptance. Significantly, the implications of utilizing this modified version of UTAUT model in testing the acceptance for any commercial application over social media will help the researchers in future. In fact, this study suggested that this modified version of the UTAUT model can be widely applied for many social or commercial technologies such as mobile applications usage, or any other e-commerce like e-banking, e-payment, e-marketing, or e-tourism. This study, additionally, suggested that the modified model can be applied over any population similar to the Jordanian culture, such as any Arab, middle-eastern or developing country. The current determinants and moderators can be examined for accepting and adopting any technology under test. Moreover, further determinants or moderators can be added to its structure such as self-efficacy, technology anxiety, technology quality, trustworthiness, cultural factors, and more, in order to improve its explanatory power for any other kind of technologies in both types of usage, (voluntary and mandatory). The ideas will not stop at this point, because this study can be developed by adopting the longitudinal survey technique in order to assess the differences in the behavioral intentions and the actual use behavior in several time points, in addition to examining the impact of increasing the experience level through the time.



## REFERENCES

- AbuShanab, E., & Pearson, J. M. (2007). Internet Banking In Jordan The Unified Theory of Acceptance and Use of Technology (UTAUT) Perspective. *Journal of Systems and Information Technology*, 9(1), 78–97. doi:10.1108/13287260710817700
- Ajzen, I. (1985). From Intentions to Actions: A Theory of Planned Behaviour. In J. Kuhl & J. Beckmann (Eds.), *Action Control* (pp. 11–39). Springer-Verlag Berlin Heidelberg. doi:10.1007/978-3-642-69746-3\_2
- Ajzen, I., & Fishbein, M. (1980). *Understanding Attitudes and Predicting Social Behavior* (1st ed.). Pearson.
- Al Qeisi, K. I., & Al-Abdallah, G. M. (2014). Website Design and Usage Behaviour: An Application of the UTAUT Model for Internet Banking in UK. *International Journal of Marketing Studies*, 6(1), 75–89. doi:10.5539/ijms.v6n1p75
- Alshibly, H. H. (2014). A free simulation experiment to examine the effects of social commerce website quality and customer psychological empowerment on customers' satisfaction. *Journal of Business Studies Quarterly*, 5(4), 21–41.
- Arbuckle, J. L. (2013). *IBM SPSS AMOS 22 User's Guide*. IBM Corp.
- ASMR. (2012). Social Media in the Arab World : Influencing Societal and Cultural Change? *Arab Social Media Report*, 2(1), 1–29.
- Attuquayefio, S., & Addo, H. (2014). Using the UTAUT Model to Analyze Students' ICT Adoption. *International Journal of Education and Development Using Information and Communication Technology*, 10(3), 75–86.
- Awang, Z. (2012). Analyzing The SEM Structural Model. In *A Handbook on SEM* (4th ed.). UiTM Kelantan.
- Bacon, L. D. (1997). *Using AMOS for Structural Equation Modeling in Market Research*. Academic Press.
- Beyari, H., & Abareshi, A. (2018). Consumer Satisfaction in Social Commerce: An Exploration if its Antecedents and Consequences. *Journal of Developing Areas*, 52(2), 55–72. doi:10.1353/jda.2018.0022
- Biucky, S. T., Abdolvand, N., & Harandi, S. R. (2017). The Effects of Perceived Risk on Social Commerce Adoption Based on The Tam Model. *International Journal of Electronic Commerce Studies*, 8(2), 124–147. doi:10.7903/ijecs.1538
- Byrne, B. M. (2010). *Structural Equation Modeling with AMOS: Basic Concepts, Applications, and Programming* (2nd ed.). Taylor & Francis Group.
- Cortina, J. M. (1993). What Is Coefficient Alpha? An Examination of Theory and Application. *The Journal of Applied Psychology*, 78(1), 98–104. doi:10.1037/0021-9010.78.1.98
- Davis, F. D. (1986). *A Technology Acceptance Model for Empirical Testing New End-User Information System: Theory and Results*. Massachusetts Institute of Technology.
- Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *Management Information Systems Quarterly*, 13(3), 319–340. doi:10.2307/249008
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management Science*, 35(8), 982–1003. doi:10.1287/mnsc.35.8.982
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1992). Extrinsic and Intrinsic Motivation to Use Computers in the Workplace. *Journal of Applied Social Psychology*, 22(14), 1111–1132. doi:10.1111/j.1559-1816.1992.tb00945.x
- DOS. (2015). The Report of the Main Results of the General Census of Population and Housing in Jordan, 2015. Department of Statistics, Jordan.
- Ernst, C. H., Pfeiffer, J., & Rothlauf, F. (2013). *Hedonic and Utilitarian Motivations of Social Network Site Adoption*. Academic Press.
- Field, A. (2009). *Discovering Statistics Using SPSS* (3rd ed.). SAGE Publication Ltd.
- Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *JMR, Journal of Marketing Research*, 18(1), 39–50. doi:10.1177/002224378101800104

- Gatautis, R., & Medziausiene, A. (2014). Factors Affecting Social Commerce Acceptance in Lithuania. *Social and Behavioral Sciences*, 110(2013), 1235–1242.
- Goronduste, A. H., & Hilman, H. (2014). Effect of Business Social Responsibility (BSR) on Performance of SMEs : Data Screening and Preliminary Analysis. *Asian Social Science*, 10(8). Advance online publication. doi:10.5539/ass.v10n8p103
- Hair, J. F. J., Black, W. C., Babin, B. J., & Anderson, R. E. (2009). *Multivariate Data Analysis* (7th ed.). Pearson.
- Hajli, M. (2013). A research framework for social commerce adoption. *Information Management & Computer Security*, 21(3), 144–154. doi:10.1108/IMCS-04-2012-0024
- Hox, J. J., & Bechger, T. M. (1998). An Introduction to Structural Equation Modeling. *Family Science Review*, 11, 354–373.
- Huang, Z., & Benyoucef, M. (2013). From E-Commerce to Social Commerce: A Close Look at Design Features. *Electronic Commerce Research and Applications*, 12(4), 246–259. doi:10.1016/j.elerap.2012.12.003
- Kim, Y., Chang, Y., Wong, S. F., & Park, M. (2014). Customer Attribution of Service Failure and Its Impact in Social Commerce Environment. *International Journal of Electronic Customer Relationship Management*, 8(1/2/3), 136–158. doi:10.1504/IJECRM.2014.066890
- Kline, R. B. (2011). *Principles and Practice of Structural Equation Modeling* (3rd ed.). The Guilford Press.
- Kripanont, N. (2007). *Examining a Technology Acceptance Model of Internet Usage by Academics within Thai Business Schools*. Victoria University.
- Kwahk, K.-Y., & Ge, X. (2012). The Effects of Social Media on E-Commerce: A Perspective of Social Impact Theory. *45th Hawaii International Conference on System Sciences*, 1814–1823. doi:10.1109/HICSS.2012.564
- Leitner, P., & Grechenig, T. (2007). Community Driven Commerce: Design of an Integrated Framework for Social Shopping. *Proceedings of the IADIS International Conference on E-Commerce*, 344–353.
- Liang, T.-P., Ho, Y.-T., Li, Y.-W., & Turban, E. (2011). What Drives Social Commerce: The Role of Social Support and Relationship Quality. *International Journal of Electronic Commerce*, 16(2), 69–90. doi:10.2753/JEC1086-4415160204
- Lim, W. M., & Ting, D. H. (2012). E-shopping : An Analysis of the Technology Acceptance Model. *Modern Applied Science*, 6(4), 49–62. doi:10.5539/mas.v6n4p49
- Ling, L. S., & Turban, E. (2008). Group Formation and Operations in the Web 2.0 Environment and Social Networks. *Group Decision and Negotiation*, 17(5), 387–402. doi:10.1007/s10726-008-9113-2
- Marchewka, J. T., Liu, C., & Kostiwa, K. (2007). An Application of the UTAUT Model for Understanding Student Perceptions Using Course Management Software. *Communications of the IIMA*, 7(2), 93–104.
- Momani, A. M. (2018). *Adoption of Acceptance Theory and Social Commerce Use (TAUSC Model) for Consumer Behaviour*. Al-Madinah International University.
- Momani, A. M. (2020). The Unified Theory of Acceptance and Use of Technology: A New Approach in Technology Acceptance. *International Journal of Sociotechnology and Knowledge Development*, 12(3), 79–98. doi:10.4018/IJSKD.2020070105
- Momani, A. M., & Jamous, M. M. (2017). The Evaluation of Technology Acceptance Theories. *International Journal of Contemporary Computer Research*, 1(1), 50–58.
- Momani, A. M., Jamous, M. M., & Hilles, S. M. (2017). Technology Acceptance Theories: Review and Classification. *International Journal of Cyber Behavior, Psychology and Learning*, 7(2), 1–14. doi:10.4018/IJCBPL.2017040101
- Momani, A. M., Jamous, M. M., & Yafooz, W. M. (2017). Investigating the Behavioral Preferences of the Jordanian Online Shoppers. *International Journal of Contemporary Computer Research*, 1(1), 13–20.
- Momani, A. M., Jamous, M. M., & Yafooz, W. M. (2018). The Influence of Enjoyment Factor Toward the Acceptance of Social Commerce. *International Journal of E-Business Research*, 14(2), 76–86. doi:10.4018/IJEBR.2018040105

- Nokelainen, P. (2009). *Structural Equation Modeling with AMOS*. Academic Press.
- Oh, J.-C., & Yoon, S.-J. (2014). Predicting the Use of Online Information Services Based on a Modified UTAUT Model. *Journal of Behaviour & Information Technology*, 33(7), 716–729. doi:10.1080/0144929X.2013.872187
- Pallant, J. (2005). *Spss Survival Manual: A step by step guide to data analysis using SPSS for Windows (Version 12)* (2nd ed.). Allen & Unwin.
- Rogers, E. M. (1983). *Diffusion of Innovations* (3rd ed.). The Free Press.
- Rogers, E. M. (2003). *Diffusion of Innovations* (5th ed.). Free Press.
- Roh, Y. Y., Smith, S., & Kim, E. (2017). Influence of Trust and Delivery System on Customer Satisfaction and Company Performance on Social Commerce Sites. *Journal of Marketing Thought*, 3(4), 43–48. doi:10.15577/jmt.2017.03.04.5
- Rondán-Cataluña, F. J., Arenas-Gaitán, J., & Ramírez-Correa, P. (2015). Travel Buying Behavior in Social Network Site Users : To Buy Online vs. Offline. *Journal of Theoretical and Applied Electronic Commerce Research*, 10(1), 49–62. doi:10.4067/S0718-18762015000100005
- Sekaran, U. (2003). *Research Methods for Business: A Skill-Building Approach* (4th ed.). John Wiley & Sons, Inc.
- Shen, J. (2007). *Social comparison, social presence, and enjoyment in the acceptance of social shopping websites*. Academic Press.
- Shen, J., & Eder, L. (2011). An Examination of Factors Associated with User Acceptance of Social Shopping Websites. *An Examination of Factors Associated with User Acceptance of Social Shopping Websites.*, 7(March), 19–21. doi:10.4018/jthi.2011010102
- Skrondal, A., & Rabe-hesketh, S. (2005). Structural Equation Modeling: Categorical Variables. In *Entry for the Encyclopedia of Statistics in Behavioral Science*. Wiley Publishing. doi:10.1002/0470013192.bsa596
- Suhr, D. D. (2005). Statistics and Data Analysis Principal Component Analysis vs. Exploratory Factor Analysis. *SUGI 30 Proceedings*, 203–30, 1–11.
- Taylor, S., & Todd, P. A. (1995). Understanding Information Technology usage: A Test of Competing Models. *Information Systems Research*, 6(2), 144–176. doi:10.1287/isre.6.2.144
- Taylor, S., & Todd, P. A. (1995a). Assessing IT Usage: The Role of Prior Experience. *Management Information Systems Quarterly*, 19(4), 561–570. doi:10.2307/249633
- Taylor, S., & Todd, P. A. (1995b). Decomposition and crossover effects in the theory of planned behavior: A study of consumer adoption intentions. *International Journal of Research in Marketing*, 12(2), 137–155. doi:10.1016/0167-8116(94)00019-K
- Teh, P.-L., & Ahmed, P. K. (2012). Understanding Social Commerce Adoption: An Extension of the Technology Acceptance Model. *IEEE International Conference on Management of Innovation and Technology (ICMIT)*. doi:10.1109/ICMIT.2012.6225832
- Thompson, S. K. (2012). *Sampling* (3rd ed.). John Wiley & Sons, Inc. doi:10.1002/9781118162934
- Triandis, H. C. (1980). Values, attitudes, and interpersonal behaviour. *Nebraska Symposium on Motivation*, 27, 195–259. PMID:7242748
- Venkatesh, V. (2000). Determinants of Perceived Ease of Use: Integrating Control, Intrinsic Motivation, and Emotion into the Technology Acceptance Model. *Information Systems Research*, 11(4), 342–365. doi:10.1287/isre.11.4.342.11872
- Venkatesh, V., & Davis, F. D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*, 46(2), 186–204. doi:10.1287/mnsc.46.2.186.11926
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: toward a unified view. *Management Information Systems Quarterly*, 27(3), 425–478. doi:10.2307/30036540
- Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory. *Management Information Systems Quarterly*, 36(1), 157–178. doi:10.2307/41410412

Vincent, K., & Thompson, S. K. (2014). Estimating Population Size with Link-Tracing Sampling. *Journal of the American Statistical Association*, 1–23. doi:10.1080/01621459.2016.1212712

Wang, C., & Zhang, P. (2012). *The Evolution of Social Commerce : The People*. Management, Technology, and Information Dimensions.

Zhao, J. J., Truell, A. D., Alexander, M. W., & Smith, S. M. (2013). Strategic Use of Social Media on Companies' E-Commerce Sites. *The Journal of Research in Business Education*, 55(2), 50–69.

## APPENDIX

Table 7. Testing Statements of the s-Commerce Acceptance Test

Construct	The related questionnaire statements
PE	<p>PE1: Using my social network account in online shopping would enhance my effectiveness of online shopping.</p> <p>PE2: Using my social network account in online shopping would help me more in searching for the most appropriate commodity.</p> <p>PE3: Using my social network account would help me in discussing opinions and requirements about the commodity with the producers, suppliers, and distributors more effectively.</p> <p>PE4: Using my social network account would ease getting reviews about the commodity from its users and discuss it with them.</p> <p><b>References:</b> (Venkatesh et al., 2003), (Ernst et al., 2013)</p>
EE	<p>EE1: Learning to shop through my account on social network would be easy for me.</p> <p>EE2: Using my social network account in online shopping is clear and understandable.</p> <p>EE3: It would be easy for me to become skillful in using my social network account in my online shopping.</p> <p>EE4: I would find it easy to let the shopping system do what I want it to do.</p> <p><b>References:</b> (Venkatesh et al., 2003), (AbuShanab and Pearson, 2007), (Davis, 1989)</p>
SI	<p>SI1: Friends on my social network account positively influenced me to use the s-commerce.</p> <p>SI2: People who influence my online shopping behavior think that I should use the s-commerce.</p> <p>SI3: I prefer to carry the online shopping process accompanied by my family or one of my friends.</p> <p>SI4: People who use the social commerce get the best deals than those who do not.</p> <p><b>References:</b> (Venkatesh et al., 2003), (Al Qeisi and Al-Abdallah, 2014)</p>
EN	<p>EN1: I like shopping by using my social network account more than the traditional online shopping process.</p> <p>EN2: I find using my social network account in online shopping process is enjoyable.</p> <p>EN3: Sharing the shopping activities between me and my friends and admiring and comments on them through social networks is an exciting process.</p> <p>EN4: Discussing the purchasing decisions with friends through the social networking sites is much beneficial to me.</p> <p><b>References:</b> (Davis et al., 1992), (Ernst et al., 2013), (Venkatesh et al., 2012)</p>
FC	<p>FC1: Using my social network account in online shopping is secured whether to my personal information or in the electronic payment process.</p> <p>FC2: By using my social network account in the online shopping, I have the whole control on the purchasing process starting from choosing the commodity as per the specifications I want and ending with completing the electronic payment successfully.</p> <p>FC3: Specialized instructions and using-tips provided by the social online shopping site are available to me during the online shopping process through using my account on the social network.</p> <p>FC4: From my experience, I found that the assistance and technical support teams in the social networks and social online shopping sites are ready for any assistance or queries.</p> <p><b>References:</b> (Venkatesh et al., 2003), (Kripanont, 2007)</p>
BI	<p>BI1: I intend to continue using the social commerce in my online shopping.</p> <p>BI2: I would use s-commerce in my online shopping to get the benefits of the use of social networking tools in the online shopping operations.</p> <p>BI3: I predict that social commerce will enrich my online shopping experience.</p> <p>BI4: I will recommend this experience to others.</p> <p><b>References:</b> (Venkatesh et al., 2003), (Lim and Ting, 2012)</p>

Alaa M. Momani is currently a faculty member at Skyline University College, Sharjah, UAE. He obtained his PhD degree in Software Engineering. His research interests lie in the area of software engineering, technology acceptance and usage behaviors, e-commerce, e-learning, social applications, and expert systems and decision support systems.