

The Effect of Social Commerce on Customers' Tendency to Buy

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Abstract

Nowadays, with the increasing development of social networks and use of information technology and the expansion of internet penetration in different aspects of life, mankind witnesses the emerge of many significant changes in various fields of economic, cultural, social and others aspects of the third millennium of human life. In the meantime, one of the most important applications of information technology from economic aspects is e-commerce which is exposed to discussion along with the other tangible applications of this technology such as e-government, electronic cities, e-banking and etc. since the advent; e-commerce has continuously transformed thanks to advancement of innovated hardware and software technologies and newer versions of e-commerce such as mobile commerce, business networking, social commerce has been formed. The most important event that occurred after the development of social networks in the world, was a subject named trade in social networks which is called social commerce.

Keywords: Social Commerce Structure, Brand Loyalty, Brand Trust, Structural Equation Modeling (SEM)

Introduction:

In an offline world, a costumer decision to buy a product or service is under the influence of friends, family and colleagues. Thus, social networks are one of the best places to do business and also, they lead to the development of a new concept called social commerce. To this day, numerous definitions of social commerce have been presented which are of course all have the same meaning. In one of the definitions, social commerce is introduced as using social media in e-commerce in order to help buy and sell goods and services online. Another definition describes social commerce as social relationships such as interests, opinions, recommendations, and etc that are effective in a business deal (Stephen and Tobia, 2010).

Since social networks are changing social commerce and can be an assist to solve some of the business problems, their opportunities and limitations should be closely studied in order to benefit from it. When

talking about change in business, whether it's organizational restructuring or new technologies, we need to ensure that the decision to change is strategic and efficient. Although the ability to measure changes from a financial aspect is unlikely be achieved, But the influence of the change in the company's short and long term investment can be considered as a benchmark. The Judgments about electronic and mobile technologies in this area is also difficult, and social networks can be a good example (Liang and Torian, 2011).

Identify customers' desire for organizations, especially business organizations, is crucial. In fact, organizations can attract customers with identifying their tendencies and designing and offering products and services suitable to their needs. The existence of social networks and business through these networks caused the customers to be under the influence of these networks intensely. Actually, interaction with social networks has heavily affected customers' preferences and tastes.

The unknown aspect of this study was to evaluate the impact of social commerce on the desires of customers in Iran. in recent years, The social networks in Iran are widely growing and a huge part of the society are using these networks. These networks are newfound in Iran thus, so many aspects of these networks has not been studied yet. In this study, social commerce will be analyzed. As a result, the unknown aspect of this study is evaluation of the impact of social commerce on the customers' tendency to buy.

The main question of this research can be stated as follows: What is the influence of social commerce on customers' tendency to buy?

Theoretical basis of research:

Still, most traders and retailers in the country are showing no interest to the importance of e-commerce in today's world, but certainly the future of commerce is in the realm of Internet and e-commerce. One way to attract customers to shop online is acquisition through social networks. According to one of the statistics, each social network user in average spends 8 hours a month in these networks and this gives the online business owners the opportunity to show their products and services and increase the possibility of sell. Another issue that have attract a lot of attention these days is a friends advice do buy a product. Statistics show that social network users show interest in the items that their friends have suggested in the social network. (Stephen and Tobia, 2010).

As a result, studying the impact of social networks on customer preferences is essential for organizations, especially business organizations. With identifying this impact and proper planning and activities in the networks, organizations can attract more customers. Lack of research in this matter can reduce the organizations' ability to compete while the business world is quickly heading towards social commerce. And in the upcoming years, the companies which participate less in this field will be left behind.

A lot of research in the field of social commerce has focused on factors affecting it. In fact, in these studies social commerce is considered as the effect of other factor. While in this study, social commerce has been considered as a factor effecting customers' tendency to buy. This study with such features is innovative and no research similar to this had been done in Iran.

Chen and colleagues (2015) conducted a study to review the decisions of customers in the social commerce space. They began their research with a practical review. In this study, social sharing and social shopping and customer preferences in such an environment were examined. The factors examined in the study included a commitment to the community, trust in the community and its members. The results show that social emotional and informational support affects the consumer's trust.

Bai et al (2015) in a study, evaluate the effect of social commerce on the behavior of their buyers. This study suggests that social commerce is a newfound version of the e-commerce. There are factors in this type of business which the most notable of them is based on sharing information between customers. In this study, a conceptual model has been developed to evaluate the effect of social commerce on

customers' purchasing behavior. Factors considered in this study include social support, sellers' uncertainty, and products' uncertainties. The results show the factors examined in this study have influence on purchasing behavior.

Yan et al. (2015) in a research, study the effect of various options present in the virtual space on the development of trust in social commerce. In their research, they have developed a graph-based model. They suggest that social commerce is a newfound version of e-commerce. The model presented in this study, combines the behavioral activities and social relationships in social networks. Actual results of the use of the model presented in this study show that this model has higher performance compared to other models in this field.

Jav et al (2015) study the network clustering between buyers and sellers in the social commerce community. This study indicates that the social commerce network connects the buyers and sellers and allows them to share their products information. This research tries to address a clustering between buyers and sellers on social commerce community. Accordingly, three categories are presented in this study. The results of this study also remained constant with a different sample size which indicates good results. The results of this research can be used for social network analysis in social commerce development.

Wood and colleagues (2014) in a study, assess the quality of electronic services of Facebook in social commerce and cooperative education. In this study, two methods of hierarchical analysis and VIKOR are used to determine optimal quality of electronic services. This study expresses that the concept of e-commerce and social commerce has changed marketing and business strategies. In this study questionnaire was used to collect data and the number of the individuals under study is 50 students who are active in the virtual space. The results of this study indicate a high potential of the Facebook social network, according to the quality of electronic services for social commerce development.

Hajjly and colleagues (2015) in a research, study the ongoing on-line participation from the social commerce view. This study tries to develop a model for study the impact of being continuously on-line and participating in social networks on the buying behavior of people. To analyze the data in this study structural equation modeling analysis and PLS software is used. The results show continuous online presence affects people's shopping behavior.

Hajjly (2015) in a study, examines the impact of social commerce on the consumer's willingness to buy. In this study, the structure of social commerce was determined using three variables and its impact on buying behavior of customers as well as customer confidence has been measured. To analyze the data in this study, SEM and PLS software is used.

Chiu et al (2015) in a study, examine the effect of social trust on opened and closed electronic commerce in B2B mode. In this study, European countries have been used to study and data was extracted from 27 European countries. The results illustrate the importance of social trust in B2B e-commerce services.

Hajjly (2015) in a study, examines the role of social support on the quality of social and social commerce. This study suggests that social factors have an effect on relationship quality. Also these impacts influence the social commerce sentiments. This study also concludes that social relationships can cause different commercial values.

Social commerce structure: social commerce structure is based on the social networks and the social in social networks which makes sharing information possible, creates the social network structure. The structure in this study has 3 dimensions: Hint and recommendation of products, ranking and review of products, forums and socials between members.

Questionnaire items are used for measuring these variables. These items measure the 3 dimensions of a social commerce structure and the use of social commerce structure dimension by members.

Buying desires: buying desires is the aspect of customer behavior which is affected by sharing the information in social networks.

For measuring these variables the questionnaire of customer buying desires are used under social network.

Trust: trust is the customer believes to social commerce and sellers in cyberspace, for satisfying the demands and needs of customers and providing products with properties according to customers' orders. For measuring these variables the items which measure and estimate the amount of trust of customers in social commerce are used.

The study hypothesizes are represented as follow:

Social commerce structures have positive and direct effect on customer desire to buying.

Social structures have positive and direct effect on members trust.

Members' trusts have positive and direct effect on customer desire to buying.

Research Model and Hypothesis

Considering the history of the study, the primary model is represented as follow:

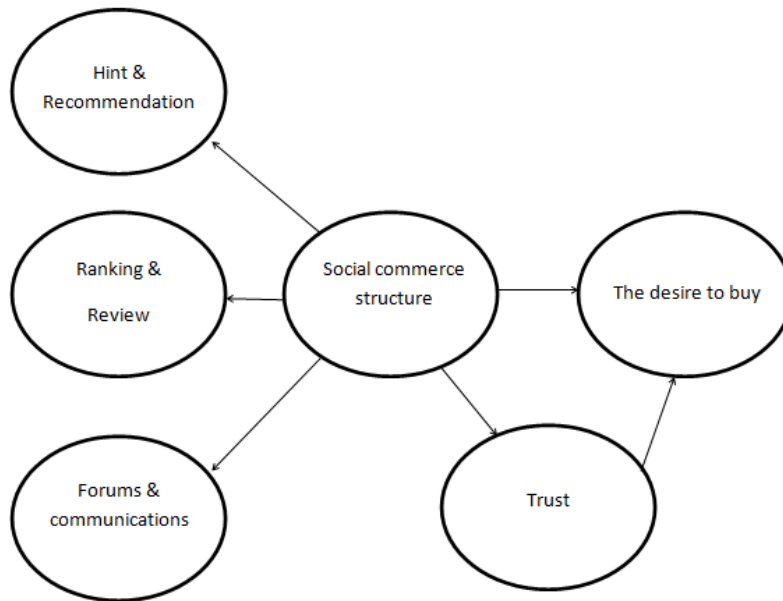


Fig 1: Research Model

Research methodology

In this study the statics methods are used for analyzing data. For validity of the questioner, the opinion of experts and the supervisor is considered. For Reliability of the questioner, Cronbach's alpha was used. Statistic society of this study is very wide, for this purpose the size of sample is set in this study.

$$n = \frac{\frac{z^2 pq}{d^2}}{1 + \frac{1}{N} \left(\frac{z^2 pq}{d^2} - 1 \right)}$$

In this formula; the maximum permissible error (d) is equal to 0.1, the sentiment is equal to 0.9, t is equal to 1.96 and p and q values are equal to 0.5 and the Population size is called N. Value of P is equal to 0.5 because n will have the maximum value possible and this cause sample to be at its highest value.

The method of sampling is the simple method.

Cronbach's alpha is calculated using the formula below.

$$\alpha = \frac{k\bar{C}}{\bar{V} + (k-1)\bar{C}}$$

$$\alpha = \frac{k}{k-1} \left(1 - \frac{\sum_{i=1}^k S_i^2}{\sigma^2} \right)$$

Here k is the number of questions, S_i^2 the variance of the ith question, σ^2 is the total variance of the questions, C is the average of covariance of the questions and V is the average variance of the questions. it can be concluded, using Cronbach's alpha definition:

- 1) With the increase in positive correlation of the question, the amount of Cronbach's alpha increases, and conversely.
- 2) As the variance of the average of questions increase, the Cronbach's alpha decreases.
- 3) Increases of number of question have no positive or negative effect on Cronbach's alpha.
- 4) Increase of sample size will lead to decrease of variance of the average of questions which results in increase Cronbach's alpha.

It is evident that as the Cronbach's alpha index is closer to 1, the internal correlation between questions and the results of questions are more homogenous. Cronbach have suggested that the reliability coefficient equal to 45% is considered low, equal to 75 % is considered mediocre and acceptable and equal to 95% is considered high(Cronbach, 1951). Obviously, in case of low alpha, it has to be checked that elimination of which questions will increase the value of alpha.

The method used for the analysis of statistical data was using structural equation. Modeling structural equations is powerful and general multivariate analyzes technique from multivariate regression family and more accurate definition of expansion of a general linear model. This gives researches the possibility of studying the regression equations simultaneously. The structural equations modeling is a comprehensive approach for testing hypothesizes relating to variables relations which is called the structural analysis of covariance, casual modeling and sometimes is called LISREL. But the dominant term these days is structural equation modeling of SEM .

In researcher opinion, one of the most powerful and proper methods of analysis, in social and behavioral studies, is multivariable analysis. Since these subjects are multivariable they cannot be solved using two variable methods which every independent variable have a dependent variable with it.

Covariance analysis (structural equation modeling) is one of the main methods of complex data structure analysis and one of the newest methods of studying the cause and effect relations. This means the analysis of different variables which shows the simultaneous effects of variables in a structure built on a theory. With this method, the credibility of theoretical methods in specific societies can be tested using correlation, non-pilot and pilot data.

This method was used in data analysis in this study. Also, SPSS and LISREL software were used for data analysis.

Research Findings

Cronbach's alpha coefficient was used to test reliability. Cronbach's alpha coefficient was invented by Crobnach and is one of the most common reliability measurement methods or questionnaire reliability. The meaning of the credibility or reliability of the questionnaire is that if the traits are measured in the same way and under the same conditions and at different times, similar results will be obtained.

The results of this test on each of the questionnaires and each item are as follows. Presented tables have been extracted by SPSS software.

Cronbach's alpha for questions of this study are as follows.

Table 1: Cronbach's alpha for the whole questionnaire.

	Average scale if a question is eliminated	Scale variance if a question is eliminated	Total unity	Cronbach's alpha if a question is eliminated
VAR00001	67.2308	305.667	.892	.986
VAR00002	67.2231	302.128	.909	.986
VAR00003	67.3308	306.781	.881	.986
VAR00004	67.2000	304.859	.890	.986
VAR00005	67.2308	304.241	.901	.986
VAR00006	67.2462	307.629	.875	.986
VAR00007	67.3000	305.995	.882	.986
VAR00008	67.2769	301.132	.917	.986
VAR00009	67.3308	305.944	.892	.986
VAR00010	67.2462	306.497	.881	.986
VAR00011	67.2385	302.757	.903	.986
VAR00012	67.2769	304.062	.889	.986
VAR00013	67.2308	305.373	.888	.986
VAR00014	67.2769	305.039	.886	.986
VAR00015	67.2077	304.507	.891	.986
VAR00016	67.3154	306.326	.874	.986
VAR00017	67.3462	305.050	.905	.986
VAR00018	67.2846	303.352	.906	.986

Cronbach's alpha results for the whole questionnaire are as follows:

Table 2: Cronbach's alpha of the questionnaire

Cronbach's alpha	Number of questions
.987	18

The results of these two tables illustrate that the questionnaire of our study has the required reliability to analyze the results. Considering that the Cronbach's alpha is more than 0.7, the extracted data from this questionnaire can be fully trusted and its results can be analyzed.

In this section, the results of demographic questionnaire are analyzed. These results reflect the distribution and diversity of respondents to the questionnaire.

The level of education of respondents and distribution percentage are shown in the following graph:

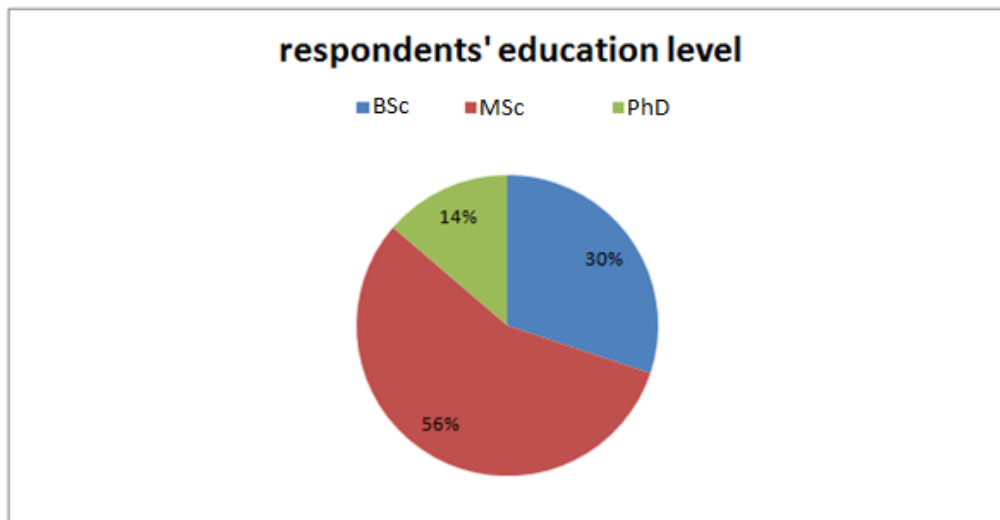


Chart 1: Respondents' education level

Work experience of respondents and its distribution is as the following graph

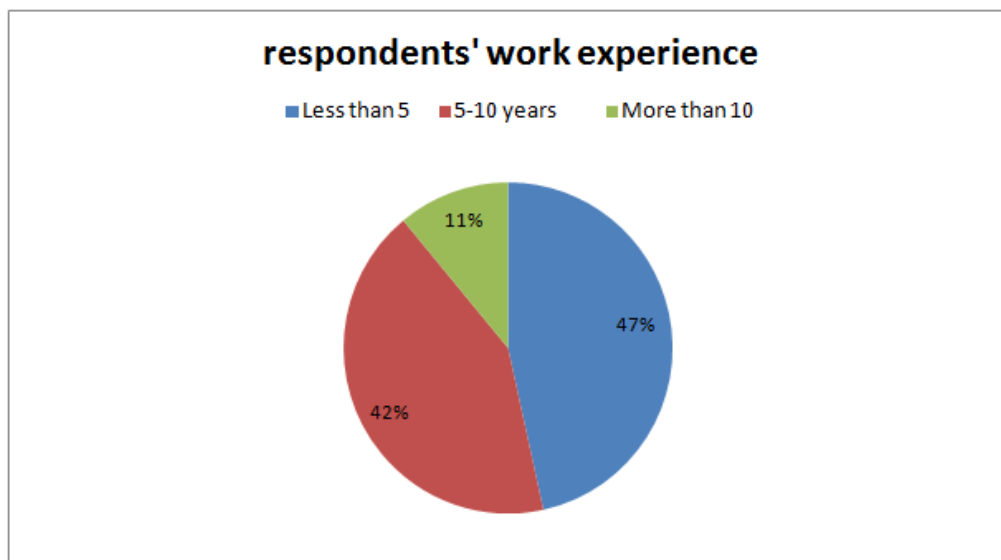


Chart 2: Respondents' work experience

As the charts above show, most respondents have an acceptable level of education and 86 percent are in MA and PhD levels. Thus, respondents of the survey have enough knowledge to answer questions. More than half of those who responded to the questions, have more than 5 years experience. Thus, they also have sufficient work experience.

As a result, respondents are considered as experts because they have sufficient knowledge and experience to answer the research questions.

As noted, in this study to measure each of the hidden variables, the visible variables were used. Questionnaire used for this purpose. The questionnaire includes questions below. Each question measure one of the hidden variables.

In the factor analysis, we must first ensure that the data can be used for analysis. In other words, whether or not they are suitable for factor analysis of the data? KMO index and Bartlett's test is used for this purpose. KMO is an index of sampling adequacy. This index is in a range from zero to one. If the index value is close to one, data is suitable for factor analysis and otherwise (generally less than 0.5) Factor analysis results are not appropriate for the data. Bartlett's test evaluates when the correlation matrix is known (mathematically, identity matrix), and thus to identify the structure (the factor model) is inappropriate. If significance level is less than 5% in Bartlett's test, factor analysis is suitable to identify the structure while the assumption that correlation matrix is known, is rejected. After verifying that the amount of KMO index is suitable and Bartlett test is significant, to examine the structure justifiability, factor loadings is used. There are many different opinions about the significance basis of these loadings. But according to a rule of thumb used by statisticians and researchers who frequently have used factor analysis, it is suggested that the factor loadings greater than $0.3 \pm$ are deemed significant. Factor loadings greater than $0.4 \pm$ have higher significance level and loads that are larger than $0.5 \pm$ are considered to be very significant (Kalantari, 1391). To ensure proper and high reliability in this study, if the load factor is less than $0.3 \pm$, that items will be excluded from the analysis.

Table 3: KMO and Bartlett

Variable	Factor number	factor coefficient	KMO test	Bartlett test
Social commerce structure	Q1	1.01	0.954	0.000
	Q2	1.09		
	Q3	0.98		
	Q4	1.00		
	Q5	1.04		
	Q6	0.94		
	Q7	1.00		
Tendency to buy	Q8	1.13	0.940	0.000
	Q9	0.99		
	Q10	0.96		
	Q11	1.08		0.000
	Q12	1.04		
	Q13	1.02		
Trust	Q14	1.01	0.940	0.000
	Q15	1.03		
	Q16	1.00		
	Q17	0.99		
	Q18	1.07		

Factor values based on the Output results from LISREL software are as follows.

Factor analysis of social commerce variable

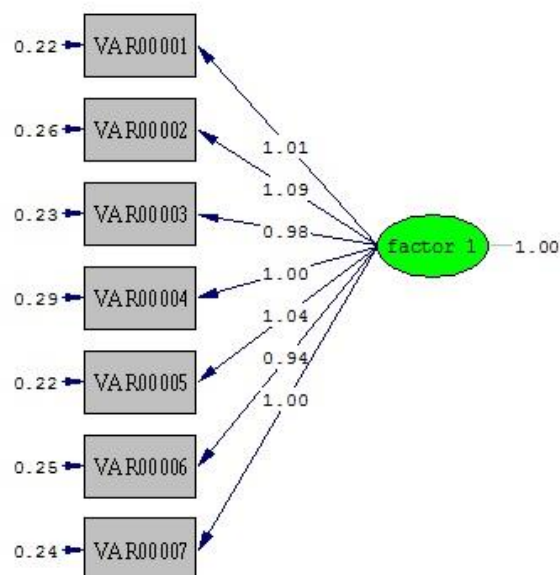


Figure 2: Factor analysis of social commerce variable

Factor analysis of tendency to buy variable

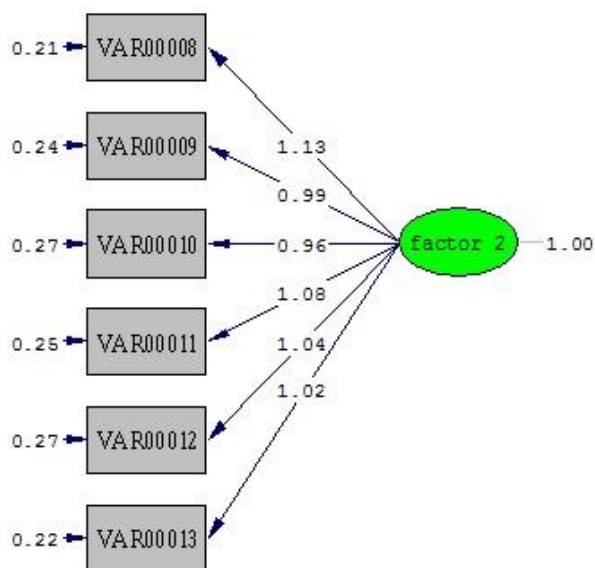


Figure 3: Factor analysis of tendency to buy variable

Factor analysis of trust variable

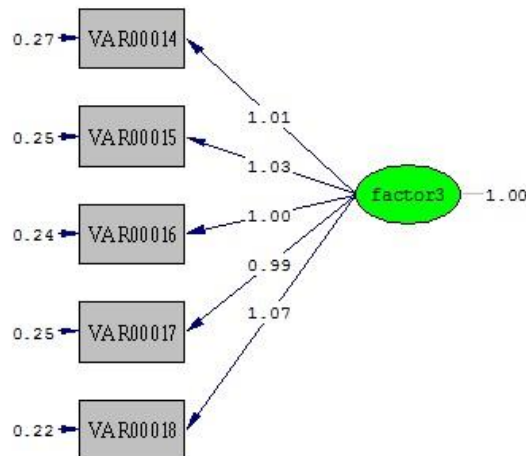


Figure 4: Factor analysis of trust variable

Bartlett and KMO sampling adequacy test as indices show that values of both indicators are at a desirable level. KMO for the all the variables is more than 0.5, and amount of Bartlett's test's significance is less than 0.05. After making sure of sample size efficiency, load factors of items were evaluated. As specified in the table above, load factors of all items are above 0.4 and therefore none of the items were excluded from the analysis.

The structure model that was designed based on conceptual model is as follows. This figure is an output from LISREL software.

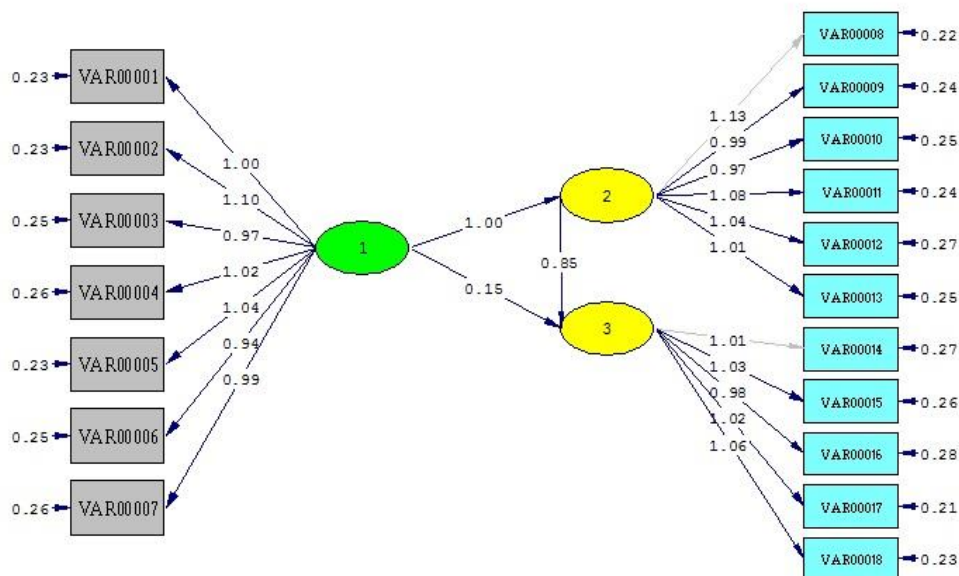


Figure 5: research model path analysis graph

The above model, according to the proposed criterion of the degree of chi-square on freedom statistics which is 0.87, is well adapted and has reliable results.

Assumptions test results extracted from LISREL software are as follows:

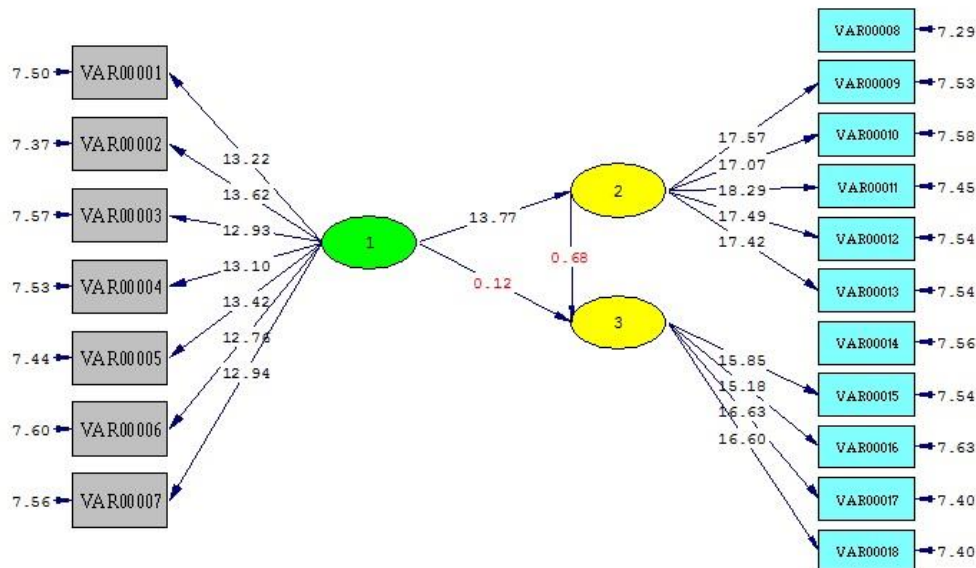


Figure 6: graph of structural equation analysis base on T test

The fields that are shown in black represent assumption test confirmation which has been obtained from this survey results.

The following table shows the results of the above model.

Table 4: Test results

	Assumption	Path coefficient	T-statistic	Test result
1	The structure of social commerce has a direct and positive impact on users' tendency to buy.	1.00	13.77	confirmed
2	The structure of social commerce has a direct and positive impact on users' trust	0.85	0.67	Rejected
3	The users' trust in social networks has a direct and positive impact on users' tendency to buy.	0.15	0.12	Rejected

Conclusion:

The results confirmed one hypothesis which will be discussed.

The structure of social commerce has a direct and positive impact on users' tendency to buy.

The results of this study show that the structure of social commerce is effective on users' tendency to buy.

The principle of social business is based on communication, users collaboration and information exchange. In fact, social commerce is a combination of business and social activities that are a subset of e-commerce.

But in relation to factors affecting consumer interest in social commerce this can be said that understanding consumer behavior is the key to success. The companies that set their objectives, methods and structure based on knowledge of consumers, are more successful. In fact, until consumer behavior is not recognized, a systematic relationship between the industry and consumers can not be build.

Consumers consider browsing in a digital environment, as a skill experience and against any action immediately receive feedback from the environment that make the search more radiant. In order to facilitate the process of consumer purchasing, the reasons that cause consumers' lack of confidence or poor site designs and lack of purchase in the digital environment should be examined. Based on the characteristics of competence, degradability without interruption, the possibility of receiving feedback and interaction in the system and mental images creation (mental structure, in the study of consumer behavior in digital environments is very important because the concept of mental structure includes cognitive tendencies of individuals. as a result, digital environment can change these trends and people's mental structure and thus lead them to buy. In this case, the potential consumer who's just visiting the targeted site for fun can change into actual buyer and place purchase from the site. In other words, Hedonic and experience-oriented mind has leaded that person to a pragmatic mental structure. Thus, "the formation model and mental structure formation" can be introduced. In the digital environment, the mind structure of the consumers can be directed to shop online and their purchase decision making process can be guided.

Now, related behaviors is used in order to achieve greater effectiveness in decision-making, reduce information processing costs, achieve greater recognition in accordance with its decisions and reduce the risk associated with consumers' choices in digital environment are some of customers' tendencies. After a few successful transactions, consumers trust their service providers and product suppliers. When their trust was gained, they know that these companies are able to meet their needs and demands and they become committed to them. Digital environment helps consumers to spend less time for carefully comparing products and decisions-making by providing a wide selection of choices, analyzing information. This environment provides comparative information and assessment data, and may reduce search costs and effort to make the purchase. Although the Internet consumers primarily interact with computer systems and cannot physically touch and feel real goods, but with the information provided by digital stores, they can make electronic decisions.

References:

- Aaker, J.L. and Maheswaran, D. (1997). "The effect of cultural orientation on persuasion", *Journal of Consumer Research*, Vol. 24 No. 3, pp. 28-315.
- Ajzen, I. (1985). "From intention to action: A theory of planned behavior," in J. Kuhl & J. Beckman (Eds.), *Action Control: From Cognitions to Behaviors*, New York, NY: Springer.
- Ajzen, I. (1991). "The theory of planned behavior." *Organizational Behavior and Human Decision Processes*, 50, 179-211.

- Alreck, P., & Settle, R.B. (2002). Gender effects on Internet, catalogue and store shopping. *Journal of Database Marketing*, 9(2), 150-162.
- Bai, Y., Yao, Z., & Dou, Y. F. (2015). Effect of social commerce factors on user purchase behavior: An empirical investigation from renren. com. *International Journal of Information Management*, 35(5), 538-550.
- Bank of England. (2000). Oversight of Payment Systems, November 2000.
- Bennett, Anthony. The five v's - a buyer perspective of the marketing , *Marketing Intelligence and Planning* , volume 15. number 3, pp 156-161, 1997
- Bhatnagar, A., Misra, S., & Rao, H.R. (2000). On risk, convenience, and Internet shopping behavior. *Communications of the ACM*, 43(1), 98-105.
- Bin, C., Sun, Q. and Shao, Q. (2003). "Cultural differences in e-commerce: a comparison between the US and China", *Journal of Global Information Management*, Vol. 11 No. 2, 44-48.
- Brousseau, C and Gressens, B. (1999). "The Value Propositions of Dynamic Pricing in Business-to-Business E-Commerce" (1999/15/1) CRM Project Volume 1.
- Burgmann, I., Kitchen, P. and Williams, R. (2000). "Does culture matter on the web?", *Marketing Intelligence & Planning*, Vol. 18 No. 1, pp. 96-97.
- Chaffey, D. (2002). *E-Business and E-Commerce Management*, Pearson Education Limited, Harlow (UK).
- Chan, R.Y.K. and Tai, S. (2001). "How do in-store environmental cues influence Chinese shoppers? A study of hypermarket customers in Hong Kong", *Journal of International Consumer Marketing*, Vol. 13 No. 1, 104-113.
- Chau, P.Y.K., Cole, M., Massey, A.P., Montoya-Weiss, M. and O'Keefe, R.M. (2002). "Cultural differences in consumers' online behaviors", *Communications of the ACM*, Vol. 45 No. 10, 143-153.
- Chaum D. (1992). Achieving electronic privacy, *Scientific American*, pp 101-96.
- Chen, J., & Shen, X. L. (2015). Consumers' decisions in social commerce context: An empirical investigation. *Decision Support Systems*, 79, 55-64.
- Christy M. K. Cheung, Lei Zhu, Timothy Kwong, Gloria W.W. Chan, Moez Limayem. (2003). "Online Consumer Behavior: A Review and Agenda for Future Research", 17th Bled eCommerce Conference – eTransformation, Bled, Slovenia.
- Cole, M. and O'Keefe, R.M. (2000). "Conceptualising the dynamics of globalization and culture in electronic commerce", *Journal of Global Information Technology Management*, Vol. 7 No. 4, pp. 17-4.
- Constantinides, E. (2004). "Influencing the online consumer's behavior: the Web experience", *Internet Research*, Vol 14, No 2, pp: 126-111.
- Constantinides, E., Influencing the online consumer's behavior, *Internet Research*, volume 14. Number 2, 126-111, 2004.
- Constantinides, E., Lorenzo-Romero, C., and Gomez, M. A. (2010). "Effects of web experience on consumer choice: a multicultural approach", *Internet Research*, Vol. 20 No. 2, 2010, pp. 188-209.
- Cox, Barbara G. and William Koelzer. (2004). *Internet Marketing*. Upper Saddle River, NJ: Prentice Hall.
- Hajli, M. N. (2014). The role of social support on relationship quality and social commerce. *Technological Forecasting and Social Change*, 87, 17-27.
- Hajli, N. (2015). Social commerce constructs and consumer's intention to buy. *International Journal of Information Management*, 35(2), 183-191.
- Hajli, N., Shanmugam, M., Powell, P., & Love, P. E. (2015). A study on the continuance participation in on-line communities with social commerce perspective. *Technological Forecasting and Social Change*.

- Liang, T. P., & Turban, E. (2011). Introduction to the special issue social commerce: a research framework for social commerce. *International Journal of Electronic Commerce*, 16(2), 5-14.
- Qu, W. G., Pinsonneault, A., Tomiuk, D., Wang, S., & Liu, Y. (2015). The impacts of social trust on open and closed B2B e-commerce: A Europe-based study. *Information & Management*, 52(2), 151-159.
- Stephen, A. T., & Toubia, O. (2010). Deriving value from social commerce networks. *Journal of marketing research*, 47(2), 215-228.
- Turban, E., & King, D. (2011). *Electronic commerce 2012: Managerial and social networks perspectives*. Pearson Higher Ed.
- Wu, Y. C. J., Shen, J. P., & Chang, C. L. (2014). Electronic service quality of Facebook social commerce and collaborative learning. *Computers in Human Behavior*.
- Xiao, B., Huang, M., & Barnes, A. J. (2015). Network Closure among Sellers and Buyers in Social Commerce Community. *Electronic Commerce Research and Applications*.
- Yan, S. R., Zheng, X. L., Wang, Y., Song, W. W., & Zhang, W. Y. (2014). A graph-based comprehensive reputation model: Exploiting the social context of opinions to enhance trust in social commerce. *Information Sciences*.