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Research Paper

Design and Fitting of E-Commerce Implementation Model in Knowledge-Based Companies Active in the Field of Information and Communication Technology

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Abstract **The purpose of this study was to design and fit an e-commerce implementation model in knowledge-based companies active in the field of information and communication technology in Tehran province. In this research, the research policy of data foundation theory was used. The statistical population of the qualitative section consists of experts familiar with the subject of research (university professors and experts in the field of study). In order to determine the sample size, a purposeful method was used and until the new concepts were not enumerated, the interview process continued until the 15th person. The statistical population of a small part is all employees of knowledge-based companies active in the field of information and communication technology in Tehran that according to surveys, approximately 21,000 people work in these companies which 378 people were selected as the sample size by racemose or random classification and Morgan table. In this research, two questionnaires have been used to collect the data needed to measure the studied variables. Experts' opinions were used to evaluate the validity of the questionnaire and Cronbach's alpha reliability of 0.87 was obtained. To analyze the data, the grounded theory approach and structural equations have been**

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used and the software is PLS. Findings showed that 81 sub-components constitute the dimensions of the model and the results of model fit also showed that the research model is valid for implementation and according to the analysis, it was found that at the 95% confidence level, all paths are significant, and as a result, the six main dimensions and subcomponents related to the model are approved.

Keywords *E-commerce, Knowledge-based Companies, Information and Communication Technology*

Introduction

The changing market provides a great opportunity for businesses to improve their customer relationship and expand their market in the online world (Croson et al., 2016). By 2019, global e-commerce sales reached $ 1.2 trillion ($ 1,000 billion) and mobile phone sales in the United States reached $ 38 billion. More than 40% of Internet users (a total of 1 billion people) have purchased goods online. These figures will continue to grow as mobile and Internet usage expands, both in the United States and in emerging markets around the world. To enter e-commerce, organizations must first justify e-commerce-related projects in themselves. Economic justification, organizational readiness and ability, financial justification and necessary infrastructure are some of the things that organizations should consider when entering e-commerce to justify it. (Tate, 2020). Empirical evidence shows that firms operating in highly competitive environments are increasingly embracing IT-related innovations (Delon and McLean, 2014) and are even more inclined to accept the Internet (Odo and Marquis, 2015). One aspect of the competitive environment that researchers have considered in relation to the decision to adopt innovation is the intensity of competition that the firm faces (Link, 2010). It is generally believed that competition increases the likelihood of accepting an innovation (Giffen and Kiel, 2016). Regarding the effect of organizational characteristics of companies on the development of e-commerce, can mention the effect of the level of internationalization of companies and the degree of

decentralization (Iz et al., 2020). The strategic orientation of companies can also play an important role in the development of e-commerce. Obviously, companies with more innovation will be more inclined to develop new technologies that will allow them to design new products, processes and methods ahead of their competitors (Kativi, 2018). Research has shown that managers of companies with IT-related training have a key role to play in adopting this technology (Breshk and Frangiz, 2016). Also, the level of public acceptance of information technology is one of the aspects that have significant effects on the decision to adopt e-commerce. As the above research shows, external stimulus factors, organizational characteristics, internal stimuli, innovation rate, manager's characteristics and information technology have been influential in the development and acceptance of e-commerce by business managers (Link, 2010). One of the biggest challenges facing knowledge-based companies is the use of e-commerce capabilities, and according to the experiences gained in recent years in these companies can be expressed, it is now known in these companies that in order to achieve proper economic growth in knowledge-based companies in the coming years, attention should be paid to the use of e-commerce. Also among the studies that focus on the adoption of information technology, only a small percentage are devoted to the topic of e-commerce acceptance and success in commercial companies. Therefore, it can be said that the issue of e-commerce in recent years has been repeatedly studied in various articles and books and various aspects of it have been discussed. However, providing a model for accepting such a business in this field is one of the categories that is less addressed in our country. Therefore, solving this challenge can be a big step for companies to move towards taking advantage of high-profit and low-cost (compared to traditional) e-commerce and make more sensible decisions by the managers of these companies, because e-commerce is not only a valuable opportunity for companies but also a serious challenge for them and requires extensive changes in infrastructure, strategic planning and organizational structure.

Background

In the early 1990s, the term e-commerce referred to the exchange of electronic data to send business documents such as purchase orders or electronic invoices, later with the expansion of this industry, the term e-commerce was used to refer to trade through the web to buy goods and services. When the first World Wide Web became ubiquitous in the United States, many researchers have predicted that this way of doing business, web-based business, will soon become an important part of the world economy but it took 10 years for http-based protocols to become widely available to users. The first e-businesses can be seen among a number of reputable businesses in the United States and Western Europe. Businesses that were formed and then developed by launching websites (Mendes, 2019). In 2000, e-commerce developed rapidly in most cities in the United States, Europe, and East Asia. Some believe that e-commerce dates back to before the advent of the Internet but due to the heavy costs of this style of business, the possibility of using it until a few years ago was briefly available to companies, businesses and economic institutions. But with the pervasiveness of the Internet and the possibility of use by all people, this opportunity was gained, the structure of e-commerce has changed and moved from being exclusive to a certain class and becoming an available industry (Babaianpour and Keramati, 2020). E-commerce is the buying and selling and exchanging of goods, services and information through computer networks including the Internet. This type of business is based on the electronic processing and transmission of data, including text, audio and video. E-commerce also includes various activities such as exchange, instant delivery of digital content, electronic funds transfer, electronic stock exchange, electronic bill of lading, business and engineering projects, and after-sales service (Lee, 2019). The main feature of this type of business is facilitating business processes, eliminating unnecessary and redundant processes in doing business and reducing costs by improving and increasing coordination, reducing administrative costs especially the cost of correspondence as well as

improving market access and increasing diversity for customers. Meanwhile, new communication technologies such as the Internet, extranets, e-mail and mobile phones are playing an important role in the development of e-commerce. Michael Dell, founder of Dell Company, who has chosen the direct sales method to sell his computers, says about e-commerce: Many stores will become exhibitions. The recent Sony and Apple stores are designed to showcase the products of these companies so that many people around the world can buy these products online. The online and offline worlds are likely to merge. Multi-channel sales can be a combination of traditional stores, unpublished catalogs, hotlines, or perhaps an e-commerce website, but in the end, the website is the place that will receive the purchase order from the customer (Kaviani, 2019). Information technology is the collection, organization, storage and dissemination of information, whether text, image or number, using computer and telecommunications tools. Today, information technology, as one of the new human technologies, has not only undergone profound changes, but also it is rapidly affecting lifestyle patterns, research methods, education, management, business, transportation, safety and security, and other areas of human life (Su, 2019). Information technology can also play a decisive role in the flourishing of human research in the opposite fields of science and engineering. Advances in computers over the past two decades, especially supercomputers, emulation software, and communication networks, have opened up new horizons for researchers to enter the real world. Using computers capable of performing trillions of calculations per second, scientists will be able to easily predict the effects of climate change, design more accurate and less polluting mechanical systems and study nature and its elements from a new perspective. Babaianpour and Keramati (2020) in a study entitled e-commerce acceptance model in government organizations by customers with a dynamic approach to systems, the results show that to increase the acceptance of e-commerce, the first step is to inform and inform the public about it. Kaviani (2019) in a study entitled presenting a

model based on factors affecting the acceptance of e-commerce in small and medium enterprises stated that based on the results of performance constructs, effort and behavioral intention from UTAUT model, behavioral control construct from TPB model and behavioral control construct from TAM / TPB / IDT model had a positive and significant effect on e-commerce acceptance in small and medium enterprises. Esmaeilpour et al. (2015) in a study entitled Challenges of accepting e-commerce in small and medium businesses stated that organizational barriers include lack of time, lack of awareness and uncertainty about the benefits and benefits, cost, lack of enthusiasm for innovation and literacy and insufficient technical skills of employees, technical barriers include incompatibility with the company's products, services and business methods, lack of necessary security and low level of hardware and software technology, and environmental barriers including low competition, low use by customers, insufficient government support, low use by partners and suppliers, and weak e-commerce legislation have a negative effect on e-commerce acceptance by small to medium-sized companies. Ahmad Khan Beigi and Ahmad Khan Beigi (2016) in a study entitled Identifying and ranking the importance of key factors in the success of e-commerce (B2B) using ANP stated that factors considered in this research are: culture, government support, senior management support and technical infrastructure. The results showed that senior management support has the highest priority among the factors. Ahmad Khan Beigi and Ahmad Khan Beigi (2015) in a study entitled Identifying and ranking the importance of key environmental factors for the success of e-commerce between B2B firm using MCDM multi-criteria decision models stated that with the advent of the Internet and many advances in the field of information and communication technology, the world has faced fundamental changes, one of these changes was the emergence of a new way of doing business called e-commerce. In this regard, it can be very important for managers to identify the factors affecting the successful implementation and implementation of B2B and determine the

current state of the organization. This study examines the critical environmental factors affecting the successful implementation and enforcement of B2B. Then, through a case study and using group ANP method, the importance of factors and their rank were determined. Mosemami et al. (2013) in a study entitled "Study of factors affecting the success of B2C e-commerce from a managerial perspective stated that findings showed that technical and managerial factors are the most important factors that will lead to the acceptance of e-commerce. Amirkhani et al. (2012) in a study entitled Analysis and ranking of factors affecting the acceptance of e-commerce in small and medium companies in the food and beverage industry stated that, results of the research indicate the fact that 5 factors within the organization, support, context, technology and environment are the factors affecting the acceptance of such a business. Also, the analysis using the Gray Topsis model showed that among the above-mentioned factors, two supportive and environmental factors are the most important factors in accepting this trade. Tate (2020) in a study entitled Challenges and Barriers to Implementing E-Commerce in Private Organizations stated that, lack of financial resources, neglect of growth and profitability through e-commerce and lack of support and commitment of managers has reduced the tendency of companies to implement e-commerce. Iz et al. (2020) in a study entitled A Theme Analysis on e-Commerce Acceptance in Nigerian Companies stated that, attention to sufficient financial resources, access to appropriate technology, skilled manpower and technology culture are the main categories of e-commerce acceptance. Venrika (2019) in a study entitled E-Commerce Acceptance stated that, factors such as compatibility, comparative advantage and increased awareness of profitability have a significant effect on the acceptance of e-commerce. Small-scale enterprises need to pay more attention to the use of e-commerce technologies such as communication networks and ensure that their work methods and organizational culture are compatible with e-commerce. Benefiting from the benefits of this technology, it has

developed an awareness of the benefits of using e-commerce by SMEs in the industrial sector and this increase in awareness can be achieved through holding workshops, seminars and promotional training courses on e-commerce. Roberto (2018) in a study entitled modeling the rational behavior of individuals in an e-commerce system stated that results of quantitative analysis show the capacity of the model to show the rational behavior of buyers and sellers and the positive effect of RMS online on the total number of transactions under different policies and scenarios. In particular, this model allows us to estimate the value of the premium in order to avoid bankruptcy. In general, our study makes it possible to solve a complex game theory model using an appropriate factor-based simulation model. Our hybrid model can be developed to solve various research questions from both modeling and application perspectives. Kativi (2018) in a study entitled Factors affecting the acceptance of e-commerce stated that the companies surveyed should pay attention to the organizational vision, aligning strategies with technology, attracting specialized manpower and management support. Mira (2018) in a study entitled the effect of external factors on determining the benefits of e-commerce among small and medium enterprises (SMEs) in Malaysia stated that, customer demand and the pressure of competitiveness in the business sector are two important driving factors for the use of e-commerce by SMEs. In terms of benefits, these extensive studies have focused on identifying the benefits or values of e-commerce in SMEs, such as reducing operating costs, improving customer retention, and improving external links. Despite extensive research on identifying the drivers of these SMEs to use e-commerce and reap its benefits, little attention has been paid to this that how external factors - customers and competitors - can influence the benefits gained. Lippo et al. (2018) in a study entitled Implementing e-commerce in Malaysian companies stated that, attention to technical infrastructure, the existence of specialized human resources, the culture of using technology and the support of operating management have an important role in this regard. E-

commerce is one of the important topics in recent years that has attracted a lot of attention in the field of information and communication technology. Reducing the cost of collecting information from customers, gaining access to a wide range of customers, and engaging with a network of environmental influencers are just some of the benefits of this business. However, this business in our country is like a toddler at the beginning of its journey, so understanding the different aspects and angles requires the efforts of researchers in the country. Studies conducted in experimental studies have shown that, so far, no research has been conducted on providing a model for implementing e-commerce in companies active in the field of information and communication technology in active knowledge-based companies and this research gap will be covered in the present study, which using this model will increase the level of readiness and maturity of the studied companies to accept e-commerce.

Method

This research will use the research strategy of data foundation theory. In 1990, Strauss and Corbyn outlined the plan and in 1998, they gave a detailed and practical statement. According to this plan, in order to analyze the collected qualitative data, it is necessary to go through three stages of "Open, Axial, and Selective Coding ". Finally, a logical or objective image of the created theory is presented. Since the main foundations of concept theory are construction, it is necessary to embed a mechanism in data theory to identify concepts and expand them according to their characteristics and dimensions. Which first explains the issue and examines it and then prepares interview questions by preparing a research plan which is followed by this mechanism in open coding; So that the researcher extracts the basic categories related to the studied phenomenon from the primary raw data by asking about the data, comparing cases, events and other states of the phenomena, in order to obtain similarities and differences. In the next stage (axial coding), the

researcher puts one of the categories at the center of the process being studied and explored (the main phenomenon) and then relates the other categories to it; These categories include causal conditions (causes of the main phenomenon), strategies (actions or interactions performed to control, manage, deal with and respond to the main phenomenon), the context (specific bedrock conditions affecting strategies), the intervening conditions (general bedrock conditions affecting strategies), and the consequences (results of implementing strategies). The statistical population of the qualitative section consists of experts familiar with the subject of research (university professors and experts in the field of study). In order to determine the sample size, a purposeful method was used and until the new concepts were not enumerated, the interview process continued until the 15th person. The statistical population of a small part is all employees of knowledge-based companies active in the field of information and communication technology in Tehran, according to the surveys, 21,000 people work in these companies, and 378 people were selected as the sample size by racemose method or random classification and Morgan table. In this research, two questionnaires have been used to collect the data needed to measure the studied variables. Experts' opinions were used to evaluate the validity of the questionnaire and Cronbach's alpha reliability of 0.87 was obtained. To analyze the data, the grounded theory approach and structural equations have been used and the software is PLS.

Findings

In this section, the collected data are analyzed that first, we tried to extract and present the important parts of the interviews, the initial codes were extracted and then one code was assigned to each open code and then the amount of identified codes was presented, in this section, the approach of Strauss and Corbin is used, which is addressed in three stages of open, axial and selective coding, and finally the research questions are answered. At this stage, the text of each interview and

related research is read first and a code is assigned to each key point. In table 1 lists the key points and extracted primary codes. Strauss and Corbin (1987) describe selective coding with open and axial coding as follows: "In open coding, the analyst creates categories and their properties and then tries to characterize how categories change over the defined dimensions. In axial coding, categories are systematically improved and linked to subcategories. "They are not yet the main categories, which will eventually be integrated to form a larger theoretical arrangement, "selective coding" is the process of integrating and improving categories so that the results of the research take the form of a theory (Strauss, 1987). At this stage of coding, Foundation Payment Theory , a theory of the relationships between the categories in the axial coding model is written. At a basic level, it provides an abstract explanatory theory for the process being studied in research. A process of integrating and improving theory in selective coding (Strauss, 1987), through techniques such as storyline writing that connects categories to everyone and the process of categorization, through personal notes, is a special valley of theoretical ideas. In one storyline, the researcher examines how specific factors affect the phenomenon and lead to the use of specific strategies with specific outputs (Chrysol, 2005, p. 398). In other words, selective coding takes the findings of the previous coding step and selects the central category; systematically relates it to other categories, it proves relationships, and completes categories that need further improvement and development. Therefore, category-orientation is a very important part of integrating and improving categories. After the axial coding of the categories and through selective coding, the pattern of the final table of codes was designed according to Table 1.

Table 1

Selective Coding

Causal conditions	**Contextual conditions**	**Interfering conditions**	**Axial factors**	**Strategies**	**consequences**
Compatibility of values Supporting values Employee focus Technology organization Holding workshops Education Courses Align strategies Competitive Advantage The culture of using technology Management support Information technology structure Organization size	Code of Ethics social responsibility Notices Inform people Network Security Technology-based career future Technology-based job position Technology-based job performance Adequate pay to IT staff Difference in IT staff salaries Supporting the services of IT staff Appropriate rewards for IT staff Appropriate level of technology Technology localization Organizational support of technology Responsibility for technology Official access to technology Technology-based job evaluation	Job fit with people Axis worthy Appropriate appointments Technology-based job evaluation Suitable work environment Technology Realism Technology support Challenging technology Technology-based career advancement Job independence Continuous learning Technical infrastructure Develop technology-based instructions Vocational training Technology skills Job knowledge and information Technology-based career advancement Problem solving skills Organizational cognition Participate in staff meetings Exchange of information Environmental compatibility with technology Career attitude towards technology	Advice to employees Empowerment Capable users Work conscience Conscientiousness towards technology Avoid ambiguity Employee motivation Ease of use of technology The usefulness of technology Funds Guaranteed future career Achieving the right technology	Sense of belonging The organization's interest in technology Adherence to the organization Need for technology Choosing the right job Specialized human power Employee knowledge of the organizational perspective Readiness to use technology Job importance Proportion of technology goals with the organization Organizational missions and missions	Information sharing Improve ability Provide feedback Occupational class decline Organizational creativity Organizational Trust Job Satisfaction Pay attention to talents Encourage brainstorming

Table 2 shows that all averages of the following components are greater than the cut-off point (spectrum cut-off) of the 5-point Likert spectrum (2.5) and considering that this average is also higher than the cut-off point of the spectrum, so it does not cause any particular problem. The above results show that the respondents answered the research questions in line with the objectives of the research and the data are scattered around the mean with a proportional standard deviation and the results obtained from the analysis of the mean and standard deviation can be seen in the table below.

Table 2
Descriptive Findings

Components	Average	Standard deviation
Causal conditions	4.55	0.455
Contextual factors	3.66	0.255
Interfering conditions	3.26	0.566
Strategies	3.89	0.355
Consequences	3.68	0.276

For exploratory factor analysis, principal component analysis and Varimax rotation have been used that in this section, 6 dimensions were extracted as model dimensions along with sub-components. These 6 dimensions generally explain 95.84% of the total variance. The criterion for selecting sub-components, as an indicator for factors, is having a specific value higher than one and also a factor load of 0.70 and higher, provided that it appears less than this value in other factors, and finally 81 sub-components were selected. Each of these indicators, the relevant factors and their operating load are shown in Table 3.

Table 3

Results of Exploratory Factor Analysis

Main dimension	Sub-dimensions	concepts	Combined reliability	Mean variance extracted
E-Commerce Acceptance	**Causal conditions**	Compatibility of values Supporting values Employee focus Technology organization Holding workshops Education Courses Align strategies Competitive Advantage The culture of using technology Management support Information technology structure Organization size	0.984	0.687
	Strategies, actions and reactions	Sense of belonging Organization's interest in technology Adherence to the organization Need for technology Choosing the right job specialized human power Employee knowledge of the organizational perspective Readiness to use technology Job importance Proportion of technology goals with the organization Organizational missions and missions	0.951	0.744
	Contextual conditions	Code of Ethics Social responsibility Notices Inform people Network Security Technology-based career future	0.936	0.782

Main dimension	Sub-dimensions	concepts	Combined reliability	Mean variance extracted
		Technology-based job position Technology-based job performance Adequate pay to IT staff Difference in IT staff salaries Supporting the services of IT staff Appropriate rewards for IT staff Appropriate level of technology Technology localization Organizational support of technology Responsibility for technology Official access to technology Technology-based job evaluation		
	Intervenors	Job fit with people Axis worthy Appropriate appointments Technology-based job evaluation Suitable work environment Technology Realism Technology support Challenging technology Technology-based career advancement Job independence Continuous learning Technical infrastructure Develop technology-based instructions Vocational training Technology skills Job knowledge and information	0.902	0.791

Main dimension	**Sub-dimensions**	**concepts**	**Combined reliability**	**Mean variance extracted**
		Technology-based career advancement Problem solving skills Organizational cognition Participate in staff meetings Exchange of information Environmental compatibility with technology Career attitude towards technology		
	consequences	Information sharing Improve ability Provide feedback Occupational class decline Organizational creativity Organizational Trust Job Satisfaction Pay attention to talents Encourage brainstorming	0.956	0.643
	Axial category	Advice to employees Empowerment Capable users Work conscience Conscientiousness towards technology Avoid ambiguity Employee motivation Ease of use of technology Usefulness of technology Funds Guaranteed future career Achieving the right technology	0.893	0.712

To check the quality of the model, the redundancy check index and the coefficient of determination are used. Positive numbers indicate the proper quality of the model. The main criterion for evaluating the structural model is the coefficient of determination. This index shows what percentage of changes in the dependent variable are made by

independent variables. Table 4 shows that 88.7% and 83.6% of the e-commerce acceptance changes are predicted by the identified sub-components (model dimensions), respectively. If the redundancy index is greater than zero, the observed values are well reconstructed and the model has the ability to predict. In this study, this index for e-commerce acceptance variables is above zero.

Table 4
Model Quality Review Indicators

Model	**Coefficient of determination**	**Redundancy**
E-Commerce Acceptance	0/887	0/566

The normality of the data distribution should be checked by calculating the skewness and Kurtosis to determine the skewness of the data scatter from the normal distribution. However, the normal distribution of data in the partial least squares method is not a basic condition. Examination of Table 5 shows that the data distribution of all sub-components of the model is normal because our degree of skewness and Kurtosis is between (1 and -1).

Table 5
Test of Normality

Model dimensions	**Skewness**	**Kurtosis**
Causal conditions	0.633	0.533
Contextual factors	0.546	0.732
Interfering conditions	0.455	0.435
Strategies	0.754	0.544
Consequences	0.733	0.594

Another presupposition of structural equation analysis is the study of variance homogeneity with respect to research variables which is done using Levin test. Given the significance level of the table, which is

greater than 0.05, it can be claimed that the dimensions of the research model are homogeneous.

Table 6
Levin Test

Model dimensions	Levine test	Significance level
Causal conditions	0.454	0.123
Contextual factors	0.564	0.433
Interfering conditions	0.601	0.121
Strategies	0.766	0.324
Consequences	0.501	0.198

Another prerequisite for structural equation analysis is the absence of multiple alignment of variables. Inflation variance (VIF) and tolerance are used to examine this condition. So if the inflation factor is above 5 and the tolerance is less than 0.1, it means that there is an alignment between the variables. As can be seen in Table 7, the dimensions of the model do not have variance inflation greater than 5 and tolerance less than 0.1, as a result, no multiple alignment is observed between the dimensions of the model.

Table 7
VIF Test

Model dimensions	VIF Level	Tolerance
Causal conditions	2.207	0.433
Contextual factors	1.870	0.535
Interfering conditions	2.765	0.382
Strategies	2.344	0.433
Consequences	3.45	0.198

One way to measure this validity is the Fornell-Locker test. Table 8 shows the results obtained for the dimensions of the research model. The table below shows that the structures are completely separate, that is, the values of the original diameter for each latent variable are greater than its correlation with other latent reflective dimensions in the model.

Table 8

Fornell Locker Index

Row	Dimensions	1	2	3	4	5
1	Causal conditions	1				
2	Contextual factors	0/831	1			
3	Interfering conditions	0/764	0/886	1		
4	Strategies	0/566	0/576	0/577	1	
5	Consequences	0/734	0/411	0/893	0/784	1

In this section, considering the conceptual model, the sample size is appropriate and all the identified dimensions are effective on the model, the model was quantified by using partial squares technique and bootstrap t-test. The results are as shown in Figures 1 and 2 for e-commerce acceptance. The results of the above figure show that all the obtained coefficients were positive for the model dimensions that it can be concluded that the model is meaningful and the results can be cited.

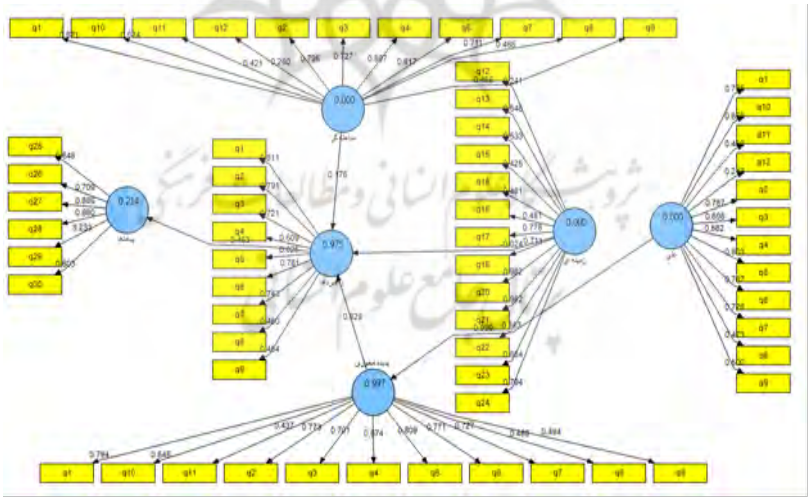

Figure 1

Standard Estimation Mode

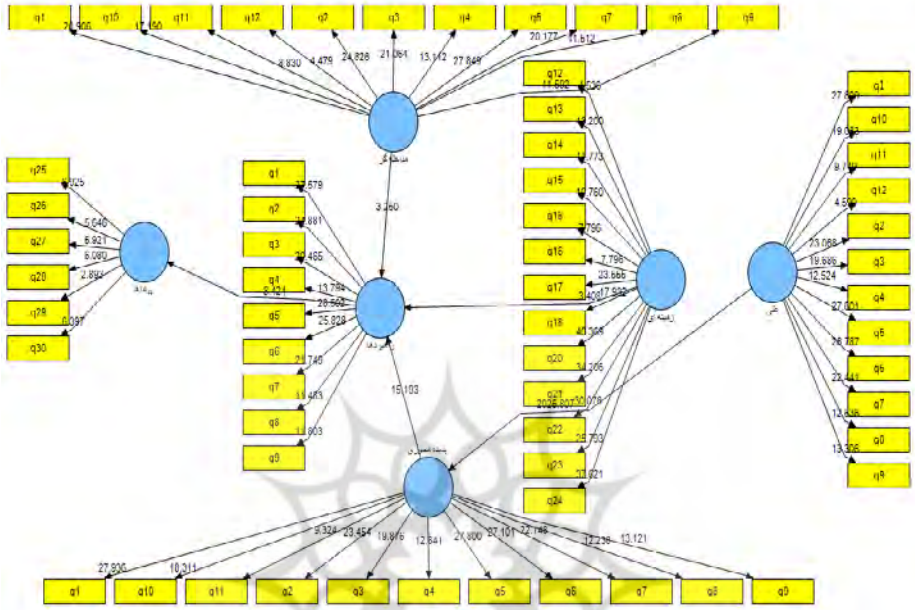

Figure 2
Significant Estimation Mode

According to the above figures, it can be said that there is a positive and significant relationship between the 6 main factors, causal conditions, contextual, interfering, strategies and consequences and acceptance of e-commerce, and these results show that with the increase of each of the identified factors and its sub-factors, we can expect to increase the acceptance of e-commerce in companies and in other words, it can be stated that the identification factors and sub-factors for accepting e-commerce should be considered by company managers in order to ensure the applicability of the model. Therefore, the model is appropriate due to the existence of positive and significant coefficients but in order to increase the degree of trust in the appropriateness of the model according to the conditions of companies using factor analysis and GOF has been further studied. In order to test the conceptual model, goodness-of-fit indicators including GFI, AGFI and RMSEA have been

used, values obtained in Table (9) show that the results of the model are reliable. Because GFI and AGFI indices are both more than expected, this statistic was higher than the criterion of 0.90. Also, the ratio of chi-square to degree of freedom (X2 / df) has shown a good value. Also, the RMSEA error criterion was estimated to be 0.03, which was less than the allowable limit of 0.08. Based on the presented estimates, it can be concluded that the model tested in the target population had a relatively good and acceptable fit. Therefore, the results of the research model show that the model used in the present study had a good fit.

Table 9
Goodness of Fit

Fit indicators	**Symbol**	**Criterion**	**Research values**	**Fit result**
Divide k-squared by the degree of freedom	X^2/df	≤3	1.34	A good fit
Root of the mean squares of the estimation error	RMSEA	≤0/08	0.03	A good fit
Fit Goodness Index	GFI	≥0/9	0/94	A good fit
Adjusted Fit Goodness Index	AGFI	≥0/9	0/91	A good fit
Comparative fit index	CFI	≥0/9	0/95	A good fit
Incremental fit index	IFI	≥0/9	0/93	A good fit
Soft fit index	NFI	≥0/9	0/92	A good fit
Non-soft fit index	NNFI	≥0/9	0/96	A good fit
Coefficient of determination	R2	≥0/67	0/76	A good fit

So that Communalities is the average value of the common values of each structure and R2 is the mean value of the Squares R values of the endogenous structures of the model. Based on Table 9, the values of coefficient of determination R2 are obtained. Also, the common value is equal to 0.76 and considering the three values of 0.01, 0.25 and 0.36 which are introduced as weak, medium and strong values for GOF, a value of 0.65 for GOF indicates a strong general fit of the research model. Since the calculated value of GOF is greater than 0.36, it indicates a good fit of the research model. Therefore, it can be said that the general

fit of the research model is very appropriate and approved. Therefore, according to the analysis, it was found that at 95% confidence level, all routes are significant and as a result, the six main dimensions and sub-components related to the model are approved.

Discussion and Conclusion

The purpose of this study was to provide a model for implementing e-commerce in knowledge-based companies active in the field of information and communication technology in Tehran province that for this purpose, research studies and expert opinions were used to identify the dimensions and sub-components of the model. The results showed that in order to accept e-commerce, the 6 main components of causal conditions, contextual, interfering, strategies and consequences and pivotal categories along with the mentioned sub-components must be implemented in the company, so that companies can be expected to be successful in implementing e-commerce. Also, for modeling, Bootstraping technique and partial squares technique in the form of structural equation method were used. The results are presented in Figures 1 and 2 and all coefficients were positive while being significant. Today, organizations have to adapt to new conditions for their survival and dynamism. Undoubtedly, the realization of this important issue requires the use of factors such as initiative and innovation in the organization and the use of new technologies such as information technology. In fact, innovation is the response that organizations provide to market changes to ensure their survival and growth in competition with other companies. Using the Internet is one of the innovations that can be efficient and effective for organizations in today's turbulent and uncertain world. Also Internet, as an important and vital platform, has also reduced the costs of data collection and access to customers, and has made it easier for companies to interact with a chain of suppliers and customers and enable them to interact electronically. Today, this form of business has attracted the attention of many experts in the field of market

and business and it provides very important opportunities for companies that can increase quality, agility and quick access to customers and thus increase their market share. E-commerce has also led to the globalization of businesses, the removal of time and space constraints, job creation, expanding market coverage, improving productivity, significantly reducing transaction costs, increasing sales percentages. Therefore, companies should consider factors and patterns to facilitate the successful adoption of e-commerce technology. Because e-commerce is not only a valuable opportunity for companies but also a serious challenge for them and it requires changes in infrastructure, strategic planning and organizational structure. However, the most important factors that companies should consider in accepting e-commerce are: axial factors (accurate and appropriate planning of the organization's business environment, appropriate goal setting, and integration of the business process with the company's strategy), interfering factors (appropriate investment, support and senior management support) Contextual factors (type of technology used in the company, the degree of turmoil in the company's business process, the degree of demand variability), Causal factors (government support, including protection laws, use of incentives, etc., security concerns and benchmarking competitors) finally, there are consequences (utilization of a range of information and communication technologies, technical and knowledge capabilities of the project team, and integration of information transmission channels). Referring to Table 9, it can be said that the model has a good fit. Regarding the model fit indicators, it can be said that X2 / df index is 1.34 which is less than 3, RMSEA index is 0.03 which is less than 0.08, GFI index is 0.94 which is more than 0.90, AGFI index is 0.91, Which is more than 0.90, CFI, IFI, NFI and NNFI indices which are more than 0.90, respectively (0.95, 0.93, 0.92 and 0.96) and also the value of GOF is equal to 0.65, which indicates the appropriate report of the model and this means that the proposed model can increase the attention to the implementation of e-commerce in knowledge-based companies based on technology,

according to the formulated goals. Therefore, causal, contextual, strategies, interventionist, consequences have formed the dimensions of the desired model and companies should pay attention to these main components along with the specified sub-components. The results of these findings with the results of research by Tate (2020), Gardon and Pearson (2004), Link (2010), Paolo and Shay (2012), Rashid and Karim (2012), Ismailpour et al. (2018), Babaianpour and Keramati (2020), Kaviani, 2019), Amirkhani et al. (2012), Odo and Marquis (2015), John (2015), Ramio (2015) are aligned and consistent.

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