



## Develop a Model to Information Technology Use for Increasing Consumer Awareness in Electronic Commerce According to the Grounded Theory at the Customs Borders of Khuzestan

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### ABSTRACT:

This study aims to develop a model to use information technology to increase consumer awareness in e-commerce at the customs borders of Khuzestan and Examining how the factors of the model influence each other and practical solutions in the direction of using information technology to increase consumer awareness of e-commerce. Therefore, due to the combined approach in the qualitative part using the grounded theory method and in-depth interviews with 18 experts (academic experts active in the field of information technology, managers of companies active in the field of e-commerce and Internet marketing officials), Developing a model for using information technology to increase consumer awareness of e-commerce at the customs borders of Khuzestan. This template consists of six main themes: 1) causal conditions (profit motive, social motivation and hedonistic motivation of cross-border e-commerce); 2) background conditions (application of information technology in cross-border e-commerce with the aim of profitability); 3) Interfering conditions (application of information technology in cross-border e-commerce with the aim of tourism); 4) central category (consumer awareness); 5) Strategies (purchase intention strategies); 6) Consequences (Consumer Consequences). Then, in the second step, using confirmatory factor analysis and structural equation modeling techniques, the resulting model was fitted, validated and tested among 110 people who have at least once experienced online shopping from abroad. In a quantitative stage, based on the research method, the correlation between the variables of the initial model and the coefficients of effectiveness of each in explaining the role of information technology in increasing consumer awareness of e-commerce was determined. Based on the statistical results of the study, causal conditions with a coefficient of 42%, intervening conditions with a coefficient of 40% and background conditions with a coefficient of 32% were effective on the central category, respectively. The least impact on the central category is related to the background conditions and the most impact is related to the causal conditions. Also, the impact of the central category on strategies is 58%, the impact of contextual conditions on strategies is 34% and the impact of intervening conditions on strategies is 29%, which has the greatest impact on the central category. The effect of strategies in the model on the outcomes was 62%.

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## 1. Introduction

E-commerce can be defined as the conduct of any business online through the Internet. This technique has grown a lot in recent years and is expected to grow even more. E-commerce refers to any transaction in which any purchase and sale of goods or services takes place through the Internet and leads to the import or export of goods or services. E-commerce usually has a wider application, that is, it includes not only buying and selling through the Internet, but also other aspects of business activity, such as purchasing, handling goods, managing production and procurement, distribution and moving of goods, as well as after-sales services in takes over. Of course, the broad concept of e-commerce is electronic business. Information technology and e-commerce have provided new solutions for business in today's world. In e-commerce, buying, selling, support and logistics are done digitally. Customers, suppliers and investors can meet online and pursue their business ideas on the online platform (Kordnaji and Heydari, 2019).

The use of e-commerce has expanded in all parts of the world and this expansion is due to the benefits of using computer networks and especially the Internet in business and commerce. In the current changing and changing conditions, to deal with the global economy and economy based on knowledge and information, traditional manual and pen-and-paper methods are no longer working. With the competition of large organizations and the change in the way of providing services, intelligent interactive systems were created to provide virtual services in the field of knowledge, which automatically determine what option and solution should be offered to the user (Santobli et al., 2018).

Companies, as a large economic enterprise, do not need these changes, and the more they enter the field of e-commerce and lead in providing better quality electronic services, they can attract more customers and provide more specific services to users. Compared to other competitors, witness more loyalty and attract more customers. Because, the quality of electronic commerce is one of the most important aspects that consumers consider when evaluating electronic services. With the advent of information technology, there is an opportunity for companies to reach more audiences. Considering the role of customers in the success of today's companies, customers as intangible assets should be attracted with tact and thought (Moon, 2019).

Trade is always reminiscent of the word mediation, and these two words are so familiar and intertwined that they are even included in online purchases and sales. Of course, the passage of time has changed the form of this mediation. Living conditions in today's world with all its unique features have led to an increase in the number of users who want to buy from online stores every day. Buying and selling goods through the global Internet network is one of the



branches of electronic commerce, in which the Internet acts as a bridge between sales centers and buyers and reduces the time and place distance between them to zero. In this branch of e-commerce, the buyer must first enter the "code system provider companies" site, which covers the online store, to order the desired product; Then by viewing and checking the products he wants, he selects them and finalizes the purchase by entering his personal information and postal address.

However, information technology now enables consumers to pool their knowledge and make decisions to get their value from international online markets. The Internet provides new ways for consumers to interact with each other, with companies, and with the electronic environment itself. Therefore, now information technology is a set of interconnected global networks that can be used as a medium to collect information around the world (Han and Kim, 2019). However, little research has been conducted on IT-related awareness development processes in e-commerce. In particular, an integrated understanding of why and how consumers use information technology to raise awareness has not been explored. Without a clear answer to such a question, marketers cannot fully assess how their e-marketing strategies fit into the consumer's purchase decision process. Consumer understanding and awareness of e-commerce provides ample opportunities to develop marketing methods that encourage consumers to use, interact, explore, and spend the Internet with e-commerce. Therefore, this research seeks to answer the question, what is the role of information technology to increase consumer awareness in e-commerce?

## 2. Research goals and questions

Research objectives:

- 1- Identifying factors and dimensions affecting the role of information technology in increasing consumer awareness in e-commerce
- 2- Explaining the impact of effective dimensions on the role of information technology in increasing consumer awareness in e-commerce
- 3- Identifying intervening and mediating variables on the role of information technology in increasing consumer awareness in e-commerce.
- 4- Identify effective strategies for the role of information technology in increasing consumer awareness in e-commerce
- 5- Consequences and results of using information technology in increasing consumer awareness in e-commerce

Research questions:

- 1- What are the factors and dimensions affecting the role of information technology in increasing consumer awareness in e-commerce?
- 2- How do variables affecting the role of information technology in increasing consumer awareness in e-commerce affect each other?
- 3- What are the intervening and mediating variables in the role of information technology in increasing consumer awareness in e-commerce?
- 4- What strategies are there to identify the role of information technology in increasing consumer awareness in e-commerce?
- 5- What consequences and results should be obtained from the use of information technology in increasing consumer awareness in e-commerce?

### **3. Theoretical framework and research background**

#### ***3-1. Electronic commerce***

During the last decades, business has made many advances; So that a large amount of exchanges no longer face-to-face and are mostly done by phone and mail and using credit cards. New forms of money and payment methods that exist today, such as electronic checks, smart credit cards, have not only led to major changes in the purchase process, but also the possibility of companies entering the field of money production, which until now has only been in the authority of the governments, it has made it possible. E-commerce is an electronic business. For companies, e-commerce is more than just buying and selling products online. E-commerce is changing the shape, competition, speed, flow, products and payment of customers to companies and from supplier companies. E-commerce is at the forefront of developments that change business activities and is called the industrial revolution of the 21st century, which will rapidly develop and expand with the advent of the Internet.

In electronic commerce, information and services are bought and sold or exchanged with the help of computer networks. Buying and selling can be wholesale or retail, physical or non-physical goods such as books or software, providing various services to buyers such as medical or legal advice and other commercial materials such as tenders and auctions, or buying and selling information between organizations, organizations be with people or between people. Various definitions have been provided for e-commerce, most of which are based on past experiences in using e-commerce. The European Commission defines electronic commerce as based on the electronic processing and transmission of data, including text, sound and images. Electronic commerce includes various activities such as electronic exchange of goods and

services, instant delivery of digital content, electronic transfer of funds, electronic stock exchange, electronic bill of lading, business plans, joint design and engineering, sourcing, government procurement, direct marketing, and after-sales services. It includes the sale (Gol Seher Nodehi, 2017).

### ***3-2. Providing models of consumer behavior in the e-commerce environment***

In this field, there are many models that show these decision-making models, purchasing behavior, and ways that can be understood by consumers. The purpose of these models is to organize and integrate the vast components of known knowledge about consumer behavior, which is briefly described by some We will pay models (Saidnia and Bani Asadi, 2014).

1. Kotler's buying behavior model: this model consists of 4 parts: marketing stimuli, macro stimuli, buyer's black box and buyer's reactions. The buyer's black box consists of 2 parts. The first part is the buyer's personal characteristics, which is based on understanding and his reaction to the stimulus has an effect, and the second part is the buyer's decision-making process, which affects his behavior.

2. Howard-Sheth model of purchase behavior: In this model, an attempt is made to explain how, through learning, certain data in response to marketing stimuli are transformed into stimuli such as purchase or other behavioral responses. This model is shown in Fig. Edited is a previous systematic and systematic attempt to build an in-depth view and theory of the consumer decision-making process.

3. Engel-Kolrat-Blackwell purchase behavior model: This model is basically used as a plan to organize the knowledge structure related to consumer behavior. The mentioned model consists of several editing channels, the purpose of which was to optimize and clarify the relationships between the main and secondary components as much as possible. As it is clear in the figure, before a message is exploited, the consumer must 1) become aware of it 2) allocate information processing capacity to the received messages 3) interpret and interpret the stimulus and motivation 4) by This motivation should be encouraged 5) to retain the messages by converting and transferring input and data to long-term memory (Saidnia and Bani Asadi, 2014).

### ***3-3. Perceived enjoyment and consumer behavioral intention***

Perceived enjoyment refers to "the extent to which the activity of using a particular system is perceived as enjoyable for them apart from any performance consequences resulting from using the system". Perceived pleasure is a dimension of intrinsic motivation and is related to the pleasure and satisfaction gained from doing the activity. On the other hand, perceived enjoyment is actually an intrinsic factor according to the theory of motivation, which refers to the

satisfaction obtained from performing an activity and is believed to be an important predictor of behavioral intention to use information technology (Wong et al., 2015). Past research has shown that the acceptance of information technology affects people who experience pleasure or happiness. Ghafoor (2013) in a research with the aim of identifying and prioritizing factors affecting the use of mobile banking technology, concluded that the variables of perceived security, perceived enjoyment, and quality of communication are most effective in accepting the use of mobile banking, respectively. Merikivi et al. (2016) conducted a research titled "Understanding the perceived pleasure in mobile gaming in order to investigate the relationship between the intention to continue and pleasure and the factors affecting the enjoyment of mobile games. Their findings show that enjoyment has a direct effect on continuous use intentions. Sun et al. (2013), in a research entitled "Understanding Users' Persistence Intention towards Online Social Networks: An Integrated Theoretical Model", have investigated the integrated research model by 320 social network users in China. The results show that the intention to continue is positively and significantly affected by the perceived pleasure (Khadami et al., 2016).

#### ***3-4. Social motivation and consumer behavioral intention***

According to Venkanesh et al. (2003), social influence is defined as "the degree to which a person perceives that others believe that he should use a new system". Social influence can facilitate the understanding of behavioral intention to adopt information technology (Wong et al., 2015). Lou et al. (2003) described social influence as a person's desire to influence the way others think about performing a particular action; For example, friends, family members, community or media can encourage a person towards the intention of mobile advertising and the person will also gauge the opinion of others about an easy and useful method. Bahreinizadeh and Khalkhi (2013) in a research entitled "Investigation of the factors affecting the acceptance of marketing by mobile and its effect on consumer purchase" have examined the factors affecting the acceptance of marketing by mobile and according to the studies conducted and the reproducibility of the factors of these results It was found that factors such as social influence, demographic variables such as age, gender and education level have the greatest effect on the acceptance of mobile marketing. Research by Wu and his colleagues (2008) using the UTAUT model to investigate the behavior of third generation mobile communication users. Based on the results of this research, social effects have a positive effect on behavioral intention and ultimately the use of third generation telecommunication services. A person's friends and family influence his use of these services; Because some think that if they don't use these services, they are left behind (Khadami et al., 2016).

#### ***3-5. The results of the research done inside and outside of Iran.***

The empirical research conducted related to the discussed field can be a good guide for research in that field. Therefore, a number of researches conducted on the discussed subject have been briefly reviewed and their results have been stated. It should be noted that it has been tried to consider selected studies in some way in relation to the subject of this research. In this regard, the studies conducted inside and outside the country are reviewed in Table (1).

**Table (1). The results of the research done in connection with the topic**

| Writers                                  | Title   | Results   |
|--|---|---|
| Hamid Sabrian (1401)                     | The effect of the use of information technology on the promotion of consumer awareness and its effect on the purchase intention in the context of electronic commerce in online chain stores. | In order to increase sales promotion and purchase motivation and strengthen or repeat online shopping behavior, they should strengthen their relationships with buyers in the first purchase period. Focusing on increasing the feeling of shopping satisfaction for online customers in the first period of shopping can also be achieved in various ways such as: perceived quality, reasonable price, discounts, after-sales services, money back guarantee in case of canceling the purchase. |
| Kurdnaj and Heydari (2019)               | The role of information technology in increasing consumer awareness in cross-border e-commerce  | The motives of using the Internet (e-commerce) to buy goods from abroad make customers use information technology to know the suppliers of goods and also how to buy online. Also, the use of information technology by increasing customers' awareness of cross-border e-commerce increases their intention to buy through the Internet.   |
| Ramezani Qutbabadi and colleagues (2019) | Identification and ranking of factors affecting the implementation of e-commerce (Study case: Tejarat Bank branches in Shiraz)  | Among the main factors, the contextual factor has the most impact, followed by the organizational and individual factors that influence the e-commerce of Tejarat Bank branches. The technology factor also has the least impact on e-commerce in Tejarat Bank branches.  |
| Shoja Kazemi                             | The role of information technology in increasing consumer awareness in e-commerce   | The dimensions of information technology, i.e., individual factors, attitudinal factors, educational factors, technical factors, economic factors, environmental factors, and human and managerial factors have a positive and significant effect on consumer awareness of e-commerce.  |
| Mojdam et al. (2018)                     | Analyzing the influencing factors on the behavior of consumers using internet shopping technology based on the integrated theory of technology acceptance and use; Case study: customers of   | Value, price and trust variables have a significant and positive effect on the intention to use internet shopping. The habit variable has a significant and positive effect on both the intention to use and the behavior of use. Also, trust variable has a significant and positive effect on word-of-mouth advertising. Also, word-of-mouth advertising and intention to   |



| Writers                | Title  | Results   |
|------------------------|--|---|
|                        | Digikala store in Khuzestan province   | use have a significant and positive effect on usage behavior.   |
| Shukri et al. (2017)   | Presenting a model for online shopping among women using the qualitative method of grounded data theory  | The results of the current research led to the identification of 28 sub-categories and 9 main categories, which in the form of a paradigm model include the intention to use online shopping as a central category and causal conditions (perception of the purchase system and customer characteristics), background factors (facilities and facilities) ), intervening conditions (buying success and compatibility and social acceptance), strategies (web features and product and promotion mix) and consequences (online shopping) were placed. |
| Ferreira et al. (2023) | Consumer intention to use and develop smart home technology: the role of environmental awareness   | Among people with a high level of environmental awareness, facilitating conditions have a greater influence on the behavior of using technologies, while habit has a lower influence. Moreover, for that particular segment of people, usage behavior is less important in explaining the recommended intention. Interestingly, even though usage behavior is not directly explained by environmental awareness, this relationship is significant when mediated by behavioral intention.  |
| Wen et al. (2022)      | Blockchain digital technology enables sustainable value creation decision-making and coordination of the e-commerce supply chain, taking into account online consumer reviews. | In the e-commerce supply chain of BOCR technology, members can optimize costs and increase profits by extracting more valuable information. Optimal selling price and service level show different magnitude relationships with production cost changes. When investment costs meet certain conditions, the use of BOCR technology can make members more profitable. Cost-sharing and profit-sharing contracts enable e-commerce coordination.  |
| Santosa et al. (2020)  | Increasing Consumers Towards E-Commerce in Central Java, Indonesia   | Purchase decisions are influenced by trust. If the quality of the products offered by the website is suitable, the consumer's trust will increase, thus forming the customer's trust.   |
| Zhao et al. (2020)     | Electronic word-of-mouth advertising and consumer purchase intention in social e-commerce  | Information quality has a positive relationship with social psychological distance and trust. Social psychological distance has a positive relationship with trust. Social psychological distance mediates the relationship between information quality and trust, and trust is positively related to purchase intention.   |
| Han and Kim (2019)     | The role of using information technology to increase consumer awareness in cross-border e-commerce: an   | have created a research model specific to cross-border e-commerce, which theorizes the relationship between different types of cross-border e-commerce motives (utilitarian, social and hedonistic), patterns of information technology use   |





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| Writers                    | Title   | Results  |
|----------------------------|---|--|
|                            | empirical study   | (productivity and discovery), awareness of the consumer's purchase intention processes The experimental test results support the research framework. Thus, they have obtained a clear and fundamental mechanism for developing cross-border e-commerce awareness among international consumers.  |
| Sana'i and Movahedi (2018) | Application of information technology and marketing strategies in e-commerce                            | Different e-commerce success factors may suit different marketing strategies as well. In particular, the results show that risk management has no significant relationship with any of the marketing strategies studied in this research, while compliance only affects the focus strategy. On the contrary, IT control has a negative effect on the focus strategy and a positive effect on both the differentiation strategy and the leadership marketing strategy. Finally, IT governance is positively related to both the price leadership strategy and differentiation is negatively related to the focus strategy. Also, information technology governance has a positive relationship with both differentiation and price leadership strategies. Also, information technology leadership plays an important role in formulating and implementing e-marketing strategy of e-business. |
| Hahn et al. (2018)         | Investigating consumer attitudes and purchase intentions in cross-border online shopping in South Korea | Attitudes about e-service quality and consumers' need for exclusivity positively influence attitudes toward online shopping from international sites, which in turn influence purchase intention. Also, self-efficacy and normative structure related to cross-border online shopping positively affect behavioral intentions.   |

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#### 4. Research methodology

The design of the present study is a sequential-exploratory combined method. In the sense that first the qualitative approach and then the quantitative approach have been used. Based on this, in the current research, the researcher first moved towards the creation of the theory by using the inductive approach and then evaluated the explained theory with a comparative approach.

##### *4-1. Population and statistical sample*

The statistical population of this research includes two qualitative and quantitative parts. In the qualitative part, the statistical population of the research includes academic experts active in

the field of information technology, managers of companies active in the field of e-commerce and internet marketing officials who have characteristics such as experience, suitability for the field of study, employment in teaching at the university, research and authoring experience in this field. They are the context. In order to sample in the qualitative part of the research, the purposeful sampling method was used, and to determine the adequacy of the sampling, the theoretical saturation criterion was used. The selected samples include 8 university professors and 10 managers of companies active in the field of e-commerce.

The statistical population of the quantitative part includes those who have at least once had the experience of online shopping from abroad, and a questionnaire was distributed among them.

#### ***4-2. Information gathering tool***

In the present research, semi-structured and in-depth face-to-face interviews were used in the qualitative part of the tool. In a small part, a researcher-made questionnaire was used to collect data. The final questionnaire was set in two parts, descriptive information of the respondents and main questions with a five-answer option on the Likert scale and statistical sampling. In the current research, the foundational data theory method using MAXQD software was used to analyze qualitative data. In this research, in the quantitative part and to analyze the data, confirmatory factor analysis was used to check the validity of the constructs and structural equation test and SPSS and AMOS software were used to test the relationships between variables.

#### ***4-3. Validity and reliability of research tools***

In qualitative research, narrative answers the question of whether the methods and techniques used in the research are related and evaluate what they were designed for or not. In the present study, in order to increase the credibility, after the implementation of the interviews, if possible, a written interview was sent to the interviewee and his approval was obtained. In addition to this, the final conceptual model extracted from the analysis of the interviews was sent to the interviewees so that they can confirm the model in terms of matching with reality.

In the quantitative part, content validity and construct validity methods were used to measure the validity of the questionnaires. To measure content validity, the research questionnaire was given to five experts and university professors, and they confirmed the validity of the research. Confirmatory factor analysis was used to measure construct validity.

Also, regarding the reliability of the research tool, Cronbach's alpha test was used to measure the reliability and internal consistency of the questionnaires. In this research, in the form of a pre-test, the distribution of the questionnaire among a sample of 30 people and their Cronbach's alpha coefficient were calculated as follows. Cronbach's alpha coefficients higher than  $\alpha=0.7$

indicate the appropriate reliability of the measurement tool. Based on this, the results of Cronbach's alpha show the high reliability of the research questionnaire.

## 5. Research findings

At this stage, in the qualitative part, the report and description of the process of collecting, classifying and analyzing the information obtained from the interview has been discussed, and in the quantitative part, the data obtained from the distribution of the questionnaire among the research community has been analyzed.

### 5-1. Analysis of research data

In this section, the stages of classification and analysis of information in three stages of open, selective and central coding have been described in detail. Then, each of the main and sub-themes of the research is explained by providing documentation from the text of the interviews.

#### 5-1-1. First step: open coding

At this stage, after the implementation of the interviews, open coding was done and important sentences were highlighted from the text of the interviews and initial codes were created.

#### 5-1-2. Second step: selective coding

After identifying the primary codes, the codes that were similar to each other were named as secondary codes. Also, similar secondary codes were classified in the form of sub-themes.

**Table (2). An example of an open coding process**

| Extracted badges   | Extracted themes  |
|--|---|
| Saving product cost and search cost; obtaining products at a lower price; lack of time, place and atmosphere limitations; Buying foreign products in a more convenient way (at any place, with access to different markets at any time); providing a more convenient and easy shopping environment; In e-commerce there are more products to choose from; Choosing a more diverse hub with a lower cost; increasing the variety of selected products; obtaining information related to product specifications, stores, sales promotion, etc.; E-commerce provides complete and extensive information about every product to buyers and sellers; Internet consumers prefer not to be disturbed during the shopping process. Online consumers have the possibility to search for products as they want without disturbing the sales personnel. Discounts and discounts; seasonal auctions; To save time in buying products; looking for quality products; quality of products and services; Access to different types of products and brands that do not exist in the country. | cost savings; convenience value; diversity in choice; availability of information; lack of social interaction; discount; saving time; quality of products and services; Access to different types of products and brands that do not exist in the country |
| Accompanying friends, relatives, sales representatives or other consumers when   | development and expansion of  |

| Extracted badges  | Extracted themes   |
|---|--|
| <p>shopping; creating a space for dialogue and interaction among consumers; share your experiences and opinions about products, services and brands with other people; Advise others to buy or not to buy a particular product or service; Electronic word-of-mouth communication is a process of dynamic and continuous exchange of information between consumers; Consumers can post their opinions, comments, or product reviews on blogs, discussion forums, product review websites, retail websites, newsgroups, and social networking sites.</p>   | <p>personal relationships with others; Sharing experiences and information with others</p>   |
| <p>the experience of curiosity; Experiencing emotional states; A sense of excitement and enthusiasm in shopping; Enjoy shopping; Recreational shopping; A pleasant way to spend leisure time; Getting pleasure and comfort; looking for new products; discover and try different products; International online shopping provides an opportunity to deviate from everyday life; Familiarity with modern fashion; Interest in different products, new items, tastes and up-to-date fashions</p>  | <p>adventure and exploration; A pleasant way to spend leisure time; Not seeking to deviate from everyday life; Familiarity with modern fashion</p>   |
| <p>The possibility of searching information related to the price, product using the dedicated program (websites) of border e-commerce; Increasing purchasing efficiency by using cross-border e-commerce specific operating systems or programs; The ability to search for price comparison information; Purchase review and evaluation, automatic recommendations; Reducing search costs for customers; Simplifying exchange processes; speeding up the transaction processing process; Economies of scale; increase transfer speed; Faster delivery, ease of purchase and lower price; ease of use of technology; Understanding the ease and usefulness of information technology</p> | <p>Search for information about price, product; Increasing purchasing efficiency using operating systems or dedicated programs; Convenience and ease of buying and facilitating payment; ease of communicating and using the experiences of others; Optimal use of time</p>  |
| <p>Using new and diverse methods to search for information; use of social network services; Review cross-border e-commerce information on discounts, payment process, customs and delivery process, product quality, delivery reliability, seller information; acquiring new information and knowledge using online forums, social network services, instant messengers; Having new cross-border e-commerce skills using online forums, social networking services and instant messengers about new shopping trends, new product news, new product shopping experiences; Using new apps, new payment methods, new forums, new social networking services and instant messengers</p>     | <p>Using new and diverse methods to search for information; Review cross-border e-commerce information on discounts, payment process, customs and delivery process, product quality, delivery reliability, seller information; Gaining new information and knowledge using online forums, social networking services, instant messengers</p> |
| <p>Consumers shop with the aim of learning about new events and trends; Obtaining sufficient information about the price of the product (reasonable price, price in local currency, etc.); Obtaining sufficient information about product characteristics (quality, design, usability, usefulness); Sufficient information about the shipping method and the ability to choose how to deliver</p>   | <p>awareness of trends; obtaining sufficient information about the price of the product; Obtaining sufficient information about product specifications; obtaining</p>  |

| Extracted badges  | Extracted themes   |
|---|--|
| the goods; Adequate information on how personal information will be used; Obtaining sufficient information about international purchasing processes (delivery processes, lead times, refund procedures, customs clearance, duties, etc.); obtaining sufficient information about sellers (seller's location, reputation, reliability, credibility); Information related to the service or sales process | sufficient information about international procurement processes; Get enough information about sellers |

**5-1-3. The third step: theoretical coding**

Theoretical codes conceptualize the possible relationship between real codes. In fact, theoretical codes provide a model of the possible relationship between the categories resulting from the integration of codes and concepts around the central category. In the following, the main themes, sub-themes and main concepts identified are presented.

**Table (3). Main concepts and subcategories**

| General category             | Subcategories  | Main concepts   |
|------------------------------|--|---|
| <b>Causal conditions</b>     | The hedonic motivation of cross-border e-commerce  | <ul style="list-style-type: none"> <li>● Saving costs</li> <li>● Convenience value</li> <li>● Diversity in choice</li> <li>● Availability of information</li> <li>● Lack of social interaction</li> <li>● Save time</li> <li>● Quality of products and services</li> <li>● Access to different types of products and brands that do not exist in the country</li> </ul>   |
|                              | The social motivation of cross-border e-commerce   | <ul style="list-style-type: none"> <li>● Development and expansion of personal relationships with others</li> <li>● Sharing experiences and information with others</li> </ul>  |
|                              | The hedonic motivation of cross-border e-commerce  | <ul style="list-style-type: none"> <li>● Adventure and exploration</li> <li>● A pleasant way to spend leisure time</li> <li>● Innovation</li> <li>● To deviate from everyday life</li> <li>● Familiarity with modern fashion</li> </ul>   |
| <b>Background conditions</b> | Application of information technology in cross-border e-commerce with the purpose of benefit | <ul style="list-style-type: none"> <li>● Search for information about the price, product</li> <li>● Increasing purchasing efficiency by using operating systems or dedicated programs</li> <li>● Convenience and ease of purchase and facilitating payment</li> <li>● Ease of communicating and using the experiences of others</li> <li>● Optimum use of time</li> </ul> |

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|                               |  |  |
|-------------------------------|--|--|
| <b>Intervening conditions</b> | Application of information technology in border e-commerce with the purpose of tourism | <ul style="list-style-type: none"> <li>● Using new and diverse methods to search for information</li> <li>● Review cross-border e-commerce information on discount, payment process, customs and delivery process, product quality, delivery reliability, seller information</li> <li>● Obtain new information and knowledge using online forums, social networking services, instant messengers</li> </ul>  |
| <b>The central category</b>   | Consumer awareness   | <ul style="list-style-type: none"> <li>● Awareness of trends</li> <li>● Obtaining sufficient information about the price of the product</li> <li>● Obtaining sufficient information about product specifications</li> <li>● Obtaining sufficient information about international purchasing processes</li> <li>● Obtaining sufficient information about sellers</li> </ul>   |
| <b>Strategies</b>             | Intention to buy   | <ul style="list-style-type: none"> <li>● Buying required products from foreign virtual markets</li> <li>● Recommend cross-border e-commerce to peers, friends and family</li> <li>● Quick and timely response to consumers</li> <li>● Brand credibility and reputation</li> <li>● Providing attractive services and reward schemes to established and reliable consumers</li> <li>● Appropriate and fair pricing for consumers</li> <li>● Advertising messages</li> <li>● Effectiveness of site information content</li> <li>● Website design</li> </ul> |
| <b>consequences</b>           | Implications for consumers   | <ul style="list-style-type: none"> <li>● Encourage others to shop online</li> <li>● Repeat purchase behavior</li> <li>● Increasing consumer confidence</li> <li>● Increasing consumer satisfaction</li> <li>● Eliminating middlemen, which will reduce prices</li> <li>● The possibility of buying customized and desirable products for consumers</li> <li>● Save time and time</li> <li>● More diverse hub selection with lower cost</li> <li>● Quick and easy product and price comparison</li> </ul>   |

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In the form of 46 main concepts, the researcher has categorized 10 categories using the Strauss and Corbin paradigm, and by conducting interviews and data analysis, he has gained a deeper understanding of the issues raised. Then, between the categories and known characteristics in the first stage of open coding, back and forth movement has been done. The interviews continued until the categories reached theoretical saturation.

**5-1-4. Research paradigm model**

The paradigm model of this research was designed based on the paradigm model of Strauss and Corbin according to figure (1). In this model, causal conditions, binding factors of e-commerce are shown. Despite these factors and conditions, the e-commerce model was designed. Background conditions are the foundation of e-commerce. Conditions that should be considered more for better success in implementing this process. Intervening conditions have a positive or negative effect on e-commerce and can disrupt or facilitate or accelerate e-commerce. In this process, the most important factor in creating the e-commerce process based on consumer awareness is considered as a central category. The strategic factor of the model is purchase intention strategies, and in the consequences dimension, the expected results from the consequences of consumers were considered. The consequences of which their manifestation means the emergence of the phenomenon of e-commerce due to the increase in the awareness of consumers.

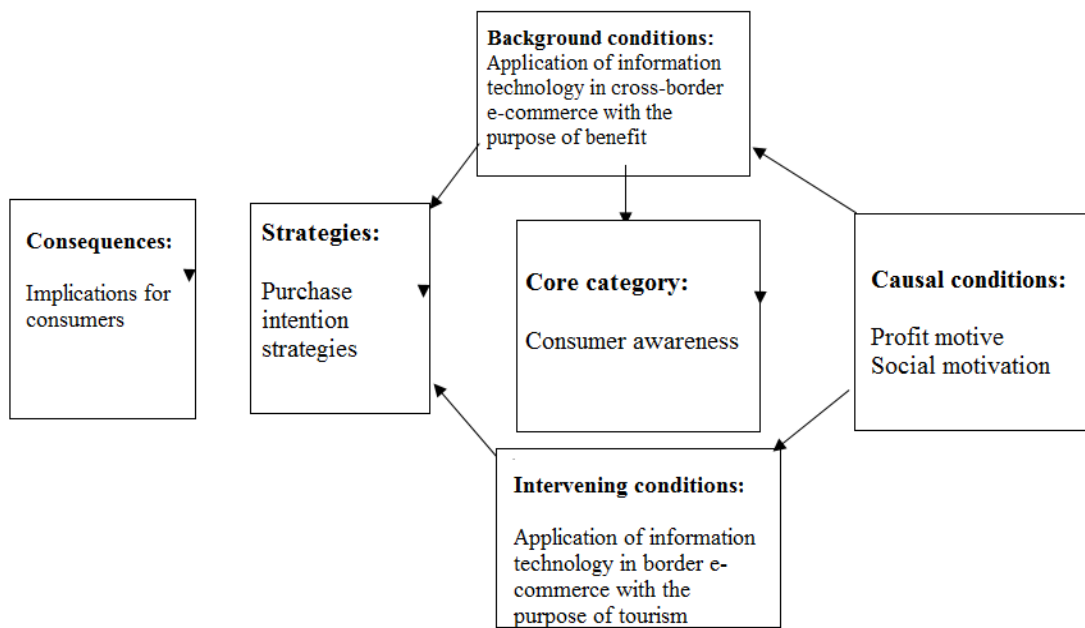


Figure (1). research paradigm model



## 5-2. Quantitative segment analysis

To analyze the collected data, analytical statistics are presented in two forms, descriptive and inferential statistics.

### 5-2-1. Descriptive statistics

Demographic statistics related to this research are briefly shown in Table 4:

In the following, based on 46 concepts and 8 main categories identified in the qualitative section, a 5-scale Likert scale questionnaire was designed, which was used in this section, and in this section, it was used to calculate the sample size based on the structural equation method, which is based on the number of main indicators and the selection of the sample size is in the interval  $q < n < 155$ , which in this research, considering that 10 main categories were identified, the average of each factor is taken into account for structural equation calculations and in The result of the 10 identified factors will be the criterion of action, as a result, the sample size should be between  $80 = (10 * 8)$  and  $120 = (15 * 8)$ , based on which the number 110, which is in the mentioned range, has been selected. After completing the questionnaires, which were randomly distributed among the examined sample, the descriptive statistics were analyzed, as follows.

**Table (4). Demographic variables**

| Demographic variables |                   | Abundance | Frequency |
|-----------------------|-------------------|-----------|-----------|
| Gender                | Man               | 84        | 76.4      |
|                       | Female            | 26        | 23.6      |
| Education             | Diploma           | 10        | 9.1       |
|                       | Bachelor's degree | 27        | 23.6      |
|                       | Master's degree   | 67        | 60.9      |
|                       | P.H.D             | 7         | 6.4       |

### 5-3. Inferential statistics

Inferential statistics become relevant when there is sampling. After examining the descriptive statistics, using inferential statistics, confirmatory factor analysis and structural equation testing using AMOS software were used to explain the relationships between the models.

### 5-3-1. Research hypothesis test

Before examining the research hypotheses, the reliability and validity indicators of the measurement model have been examined, and the test of each of the research hypotheses has been presented.

### 5-3-2. Reliability and validity of indicators

Before examining the relationship of the model, the reliability and validity indicators of the measurement model have been examined, and the test of each of the research relationships has been presented. In the following, the combined reliability index and convergent validity are presented. To measure the validity of the structure, the measurement model and factor loads are presented below.

#### A. Narrative

According to the implementation of the factor analysis model of the confirmation stage and the calculation of the path coefficients based on the table below, all the paths are significant, which can be concluded that the structure development of a model for ‘the use of information technology in increasing consumer awareness in e-commerce According to the data theory’, the foundation has the necessary validity in the customs borders of Khuzestan.

**Table (5). Values of path coefficients**

| Variable                         | Dimensions<br>Values of<br>standardized<br>weights  | path<br>coefficient<br>( $\beta$ ) | P VALUE | C. R<br>(test<br>statistics) | Multiple<br>correlation<br>squared (R-<br>squared) | Variance of<br>errors |
|----------------------------------|---|------------------------------------|---------|------------------------------|--|-----------------------|
| <b>Causal<br/>conditions</b>     | Profit motive   | 0.88                               | 0.000   | 4.833                        | 0.77   | 0.078                 |
|                                  | 0.89  |                                    |         |                              |  |                       |
|                                  | Social<br>motivation  | 0.69                               |         |                              |  |                       |
| <b>Background<br/>conditions</b> | Hedonic<br>motivation   | 0.54                               |         |                              |  |                       |
|                                  | Application of<br>information<br>technology in<br>cross-border e-<br>commerce with<br>the purpose of<br>benefit | 0.67                               | 0.000   | 7.487                        | 0.45   | 0.07                  |

|                               |  |      |       |        |      |      |
|-------------------------------|--|------|-------|--------|------|------|
|                               | 0.45   |      |       |        |      |      |
| <b>Intervening conditions</b> | Application of information technology in border e-commerce with the purpose of tourism | 0.61 | 0.000 | 6.547  | 0.37 | 0.09 |
|                               | 0.47   |      |       |        |      |      |
| <b>The central category</b>   | Consumer awareness   | 0.59 | 0.000 | 6.222  | 0.34 | 0.07 |
|                               | 0.44   |      |       |        |      |      |
| <b>Strategies</b>             | Purchase intention strategies  | 0.75 | 0.000 | 8.627  | 0.56 | 0.05 |
|                               | 0.56   |      |       |        |      |      |
| <b>consequences</b>           | Implications for consumers   | 0.87 | 0.000 | 10.874 | 0.76 | 0.06 |
|                               | 0.76   |      |       |        |      |      |

In the first column of the above table, the values of the standardized weights that show the importance of the factors, and the minimum standard value is 0.40, and as it is known, all the values are greater than the minimum standard value, and in the second column of the table, all the coefficients of the path are greater than the value of 0.40. Also, according to the value of P, which are all zero and less than the level of 05. and the values of the test statistic (C.R) are more than the critical value of 1.96, as a result, all the paths are significant. , central, strategies and consequences on the main variable of the research, which are the development of a model for the purpose of using information technology to increase consumer awareness in e-commerce based on the foundation's data theory in the customs borders of Khuzestan has a positive and significant effect, the positive effect on It is based on the positivity of the path coefficients.

#### B. Composite reliability

The combined reliability of the proposed model (structure) is calculated from the combined reliability equation which is as follows. (Kalantari, 2018):

$$P_c = \frac{(\sum \alpha)^2}{(\sum \alpha)^2 + (\sum \theta)}$$

where  $\alpha$  is the factor loadings related to the indices and  $\theta$  is the variance of the errors of the indices and the combined reliability PC and the result of placing the numbers is as follows:

$$P_c = \frac{\sum R^2}{\sum R^2 + \sum \theta^2} = \frac{.87+.75+.59+.67+.88}{.87+.75+.59+.67+.88+.06+.05+.09+.07+.07} = 0.967$$

The result of rounding the number is 0.967 This number is more than 60. As a result, the model (structure) is stable.

**5-4. Research conceptual model test**

5-4-1. Path analysis based on the ground theory model related to the qualitative part

In this section, after validating the structure in the previous section, the final model is presented based on the premise of Grounded theory and confirmatory factor analysis, and we examine the significance of direct and indirect paths, and the hypotheses have been answered.

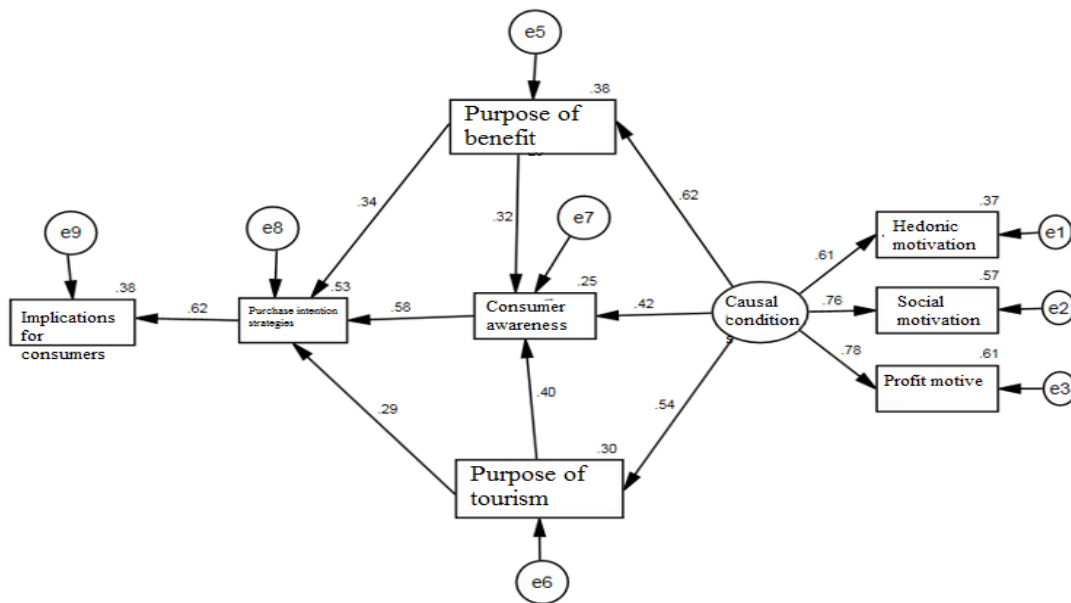


Figure (2): research model, path analysis based on ground theory model, output of AMOS software

Table (6). Goodness of fit indicators, path analysis

| --             | RMSE           | IFI           | GFI           | Cmin/df     |
|----------------|----------------|---------------|---------------|-------------|
| Standard limit | Less than 0.08 | More than 0.9 | More than 0.9 | Less than 5 |
| Model values   | 0.076          | 0.904         | 0.992         | 2.778       |

In the above table, four goodness of fit indices are shown, which are modified according to the fit of different models and the correlation between the error values in the above graph, and are within the standard range. Also, the method of implementing the model is the maximum likelihood method.

#### ***5-4-2- Examining research hypotheses***

Hypothesis (1): Causal conditions (profit motive, social motive and hedonistic motive from cross-border e-commerce) have a positive and significant effect on the central category (consumer awareness).

Hypothesis (2): background conditions (use of information technology in cross-border e-commerce with the purpose of usefulness) have a positive and significant effect on the central category (consumer awareness).

Hypothesis (3): Intervening conditions (the use of information technology in cross-border e-commerce with the purpose of tourism) have a positive and significant effect on the central category (consumer awareness).

Hypothesis (4): The central category (consumer awareness) has a positive and significant effect on strategies.

Hypothesis (5): background conditions (application of information technology in cross-border e-commerce with the purpose of usefulness) have a positive and significant effect on the adoption of strategies.

Hypothesis (6): Intervening conditions (the use of information technology in cross-border e-commerce with the purpose of tourism) have a positive and significant effect on the adoption of strategies.

Hypothesis (7): Strategies have a positive and significant effect on the consequences of its implementation.

Hypothesis (8): Causal conditions have a positive and significant effect on strategies through the conditions of the interveners.

Hypothesis (9): Causal conditions have a positive and significant effect on strategies through background conditions.

**Table (7).**

| The Main Hypothesis                            | Direct Impact | Test        |         | Total Effect | Test Result          |
|--|---------------|-------------|---------|--------------|----------------------|
|  |               | Result (CR) | P Value |              |                      |
| Causal conditions on the central category      | 0.42          | 5.192       | 0.000   | 0.42         | hypothesis confirmed |
| Background conditions on the central category  | 0.32          | 3.937       | 0.000   | 0.32         | hypothesis confirmed |
| Intervening conditions on the central category | 0.40          | 4.028       | 0.000   | 0.40         | hypothesis confirmed |
| A central category on strategies               | 0.58          | 5.146       | 0.000   | 0.58         | hypothesis confirmed |
| Background conditions on strategies            | 0.34          | 3.476       | 0.000   | 0.34         | hypothesis confirmed |
| Intervening conditions on strategies           | 0.29          | 3.276       | 0.000   | 0.29         | hypothesis confirmed |
| Strategies over consequences                   | 0.62          | 8.278       | 0.000   | 0.62         | hypothesis confirmed |

The profit path coefficient between the causal conditions (motivational, social and hedonistic motivation from cross-border e-commerce) and the central category (consumer awareness) includes a direct effect, the value of which is 0.42. In total, the total effect is also the same number as 0.42. The effect is positive due to the positive number of the multiplication of the path. Also, the value of p is zero, which is less than the critical level of 0.05 and the test statistic is 5.192, which is more than the critical level of 1.96, which is significant as a result of this effect, so the causal conditions (profit-seeking motivation, social and exciting pleasure-seeking motivation) of cross-border e-commerce) has a significant effect on the focus category (consumer awareness).

The coefficient of the path between the background conditions (use of information technology in cross-border e-commerce with the purpose of benefit) on the central category (consumer awareness) includes a direct effect, the value of which is 0.32. In total, the total effect is also the same as 0.32 and this effect is positive. Paying attention to the positive number of the path coefficient is positive. Also, the value of p is zero, which is less than the critical level of 0.05. And the test statistic is 3.937, which is more than the critical number of 1.96. As a result, this effect is significant, so the conditions of the background conditions (use of information technology in cross-border electronic commerce with the purpose of usefulness) has a significant effect on the central category (consumer awareness).

The coefficient of the path between the intervening conditions (the use of information technology in cross-border e-commerce with the purpose of tourism) on the central category (consumer awareness) includes a direct effect, the value of which is 0.04. In total, the total effect is also the same as 0.04 and this effect is positive. Also, the value of  $p$  is zero, which is less than the critical level of 0.05 and the test statistic is 4.028, which is more than the critical number of 1.96. As a result, this effect is significant, so the intervening conditions (use of information technology in border e-commerce with the purpose of tourism) has a significant effect on the central category (consumer awareness).

The path coefficient between the central category (consumer awareness) on strategies includes a direct effect, the value of which is 0.58, which in total is the same number as 0.58, and this effect is positive due to the positive path coefficient number. Also, the  $p$  value is zero, which is less than the critical level of 0.05, and the test statistic is 4.028, which is more than the critical number of 1.96. As a result, this effect is significant, so the central category (consumer awareness) on strategies has a significant effect.

The path coefficient of background conditions (the use of information technology in cross-border e-commerce with the purpose of benefit) in the adoption of strategies includes a direct effect, the value of which is 0.34, and the total effect is also the same number of 0.34, and this effect is positive. The path coefficient number is positive. Also, the  $p$  value is zero, which is less than the critical level of 0.05, and the test statistic is 3.476, which is more than the critical number of 1.96. As a result, this effect is significant, so the background conditions (use of information technology in cross-border electronic commerce) with the purpose of usefulness) has a significant effect in adopting strategies.

The path coefficient of the intervening conditions (application of information technology in cross-border e-commerce with the purpose of tourism) in adopting strategies includes a direct effect, the value of which is 0.29. The path coefficient number is positive. Also, the  $p$  value is zero, which is less than the critical level of 0.05, and the test statistic is 3.276, which is more than the critical number of 1.96. As a result, this effect is significant, so the intervening conditions (use of information technology in cross-border electronic commerce) with the purpose of tourism) has a significant effect in adopting strategies.

The path coefficient of the strategies in the results includes the direct effect, the value of which is 0.62, which is the total effect of 0.62, and this effect is positive due to the positive value of the path coefficient. Also, the  $p$  value is zero, which is less than the critical level of 0.05, and



the test statistic is 3.276, which is more than the critical number of 1.96. As a result, this effect is significant, so the strategies have a significant effect on the results.

Examining the mediation hypothesis:

The Sobel test is used for the significance of the mediating effect of one variable in the relationship between two other variables. One of the disadvantages of this test is that it requires a lot of data for an accurate and valid result. In this test, a Z-value is obtained through the following formula. If this value exceeds 1.96, it can be The 95% confidence level tested the significance of the mediation effect.

$$Z - value = \frac{a \times b}{\sqrt{(b^2 \times s_a^2) + (a^2 \times s_b^2) + (s_a^2 \times s_b^2)}}$$

a: Path coefficient value between the independent variable and the mediator

b: Path coefficient value between mediator and dependent variable

S<sub>a</sub>: is the standard error of the path between the independent variable and the mediator

S<sub>b</sub>: is the standard error of the path between the mediator and the dependent variable

Hypothesis (8): Causal conditions have a positive and significant effect on strategies through the conditions of the interveners.

$$Z - Value = \frac{0.54 \times 0.29}{\sqrt{(0.29 \times 0.064) + (0.54 \times 0.057) + (0.064 \times 0.057)}} = 4.356$$

Based on the results obtained, the z-value is equal to 4.356, which is higher than 1.96, so it can be said that the causal conditions have a positive and significant effect on the strategies through the conditions of the interveners.

Hypothesis (9): Causal conditions have a positive and significant effect on strategies through background conditions.

$$Z - Value = \frac{0.62 \times 0.34}{\sqrt{(0.62 \times 0.021) + (0.34 \times 0.073) + (0.021 \times 0.073)}} = 4.60$$

Based on the results obtained, the z-value is equal to 4.60, which is higher than 1.96, so it can be said that causal conditions have a positive and significant effect on strategies through background conditions.

## 6. Conclusion

The purpose of this article is to develop a model to use information technology to increase consumer awareness in e-commerce based on the foundational data theory in Khuzestan customs borders; which examined the findings and results of the coding and examination of the categories

extracted in the first stage, which led to the design of the model. In this research, the interviewees in the first stage of the research were asked to state the factors that can influence the role of information technology in increasing consumer awareness in e-commerce and discuss these events in detail.

In this model, the causal conditions show the binding factors of e-commerce considering the role of information technology in increasing consumer awareness. Despite these factors and conditions, the information technology model was designed to increase consumer awareness in e-commerce. Background conditions are the foundation of e-commerce. Conditions that should be considered more for better success in implementing this process. Intervening conditions have a positive effect on e-commerce and can facilitate and accelerate e-commerce. In this process, the most important factor in creating the e-commerce process based on consumer awareness is considered as a central category. The strategic factor of the model is purchase intention strategies, and in the consequences dimension, the expected results from the consequences of consumers were considered. The consequences of which their manifestation means the emergence of e-commerce phenomenon due to the role of information technology in increasing consumer awareness.

After identifying the indicators in the qualitative section, quantitative methods were investigated in this section.

Based on the correlation research method, the relationships between the variables of the primary model and the influence coefficients of each in explaining the role of information technology in increasing consumer awareness of e-commerce were determined. Based on the statistical results of the research, causal conditions with a coefficient of 42%, intervening conditions with a coefficient of 40%, and contextual conditions with a coefficient of 32% were influential on the central category. The lowest influence on the central category is related to contextual conditions and the highest influence is related to causal conditions. Also, the impact of the central category on strategies is 58%, the impact of background conditions on strategies is 34%, and the impact of intervening conditions on strategies is 29%, which is the most impact related to the core category. The influence of strategies in the model on outcomes was 62%.

The results of this research show that consumers follow three motivations to use information technology to raise their awareness, and these motivations include profit-seeking, which means choosing the best type of desired product at a reasonable cost, and social motivation, which means participation and getting the opinions of others. Consumers and pleasure-seeking motivation means virtual browsing in stores to find out about the product collection. Also, in this research, it was determined that the profit-seeking motive for using information technology is



related to the purpose of benefiting from e-commerce, and the social and pleasure-seeking motives for using information technology are related to the purpose of tourism in cross-border e-commerce. Also, the findings of this research have shown that among the motives for using information technology in cross-border e-commerce, profit-seeking motives, hedonistic motives, and social motives encourage the use of electronic commerce.

Increasing the awareness of consumers both in terms of the purpose of usefulness and the purpose of tourism in cross-border e-commerce will increase the intention to buy through the Internet.

Therefore, it seems that saving time and money and using easy methods for online shopping in foreign markets are highly attractive for consumers to use international electronic commerce. that informing customers in this field can be beneficial.

Eliminating middlemen is one of the most valuable gifts of e-commerce to buyers, which will cause an unprecedented reduction in prices and also reduce the time of transactions. With e-commerce, it is possible to cover a wide range of producers and gain the possibility of more bargaining in trade exchanges, which is not possible in traditional trade due to geographical limitations. The possibility of supplying and selling products by manufacturers to the market of all countries, and this means the possibility of globalization of sellers with the lowest possible cost and the possibility of wider marketing. Another advantage of e-commerce is the possibility of buying customized and desirable products. This means that when you buy a product, you transfer your desired features to the seller, and the seller, if possible, produces the product according to your wishes and makes it available to you.

Now this method of selling has become more popular in industrial products, while in the early years it was only possible to realize such a thing in the case of simple products such as watches, books, etc. The place to expand and increase the number of buyers and sellers is provided in this type of market. Despite the large number of buyers and sellers, full competition will be possible in the market, and none of the buyers and sellers can have an effect on the conditions and prices of the market. E-commerce will cause a change in business practices, which will result in a drastic increase in the scale of production, decrease in exchange costs, decrease in distribution costs, increase in competition, etc., all of which will decrease production costs and increase social welfare.

### ***5-3-1- Practical suggestions***

Providing quality and diverse products and services with reputable, well-known brand names and suitable prices for online sales to customers on the site; Variety of ways to communicate

with consumers (creating a sense of importance in consumers, having a consumer club, consulting with specific consumers, receiving feedback from consumers about support, maintaining communication after purchase, the possibility of tracking opinions, suggestions and criticisms ); E-stores should differentiate their brand name and brand from their competitors by creating appropriate commercial advertisements and strengthen consumers' attitudes with appropriate advertisements so that these attitudes evolve into consumer beliefs and finally become destructive intentions; providing proper after-sales services and providing correct and sufficient comprehensive information about goods and services to customers on a regular basis; Examining education and information in the expansion of electronic commerce; Taking the necessary measures to facilitate the sending and receiving of goods across the country and abroad, increasing the security factor in the cyberspace and providing training for the purpose of culturalization in the field of doing things related to electronic commerce; Making the necessary investments to increase the level of security and purchase risks, in order to increase the trust of users; Using the experiences of leading countries in the field of customs and tax infrastructure and trade; Optimizing the customs system, eliminating the monopoly of the customs system, standardizing customs rules.

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