The role of e-commerce in the exporting of country (Case study: food products)

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Abstract: In today's world, information and communication technology and its applications lead to significant developments in the economic, social and cultural processes, so that some of the previous common routines are fully obsolete and replaced by the third millennium practices or the so-called virtual practices. In this research the impact of e-commerce application on the amount of export of food products was studied and suggestions and conclusions were provided. In this study, the literature review and theoretical and methodological aspects of research were explain. The study was conducted by field method supported by library method. The sample included companies producing food products. After reviewing the research literature and analysis of the indicators of the capabilities of e-commerce, 24 main variable in the form of three indices of improvement of the efficiency of the export process, increasing revenue and reducing costs for export were identified and developed and data were collected through a questionnaire and qualitative and quantitative statistical techniques were for the analysis of the data. The results indicate a significant and positive impact on the export of e-commerce and three variables evaluated. According to the results of the investigation, the government policy makers in the export and export managers are recommended to use more e-commerce to develop export policies.

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1. Introduction

The dramatic development of ICT tools in recent decades have made changes in many areas, including e-commerce followed by changes in several activities such as business, economics, banking, customs, etc. (1).

With the arrival of the third millennium, more intensive competition and economic centers of the world's and governments has occurred, especially in the commercial field. Each of the owners of economic power, ranging from enterprises and countries, trade unions and regional organizations as actors of economic rationality and countries, trade unions and regional organizations as major economic powers are trying to take the highest share of the points and opportunities available in the global trade. But with the progress of science and technology, the situation has reached the stage that the owners of economic power are not satisfied with existing opportunities, possibilities and create new opportunities by preparing ground and facilities (2).

One of the most important opportunities to facilitate trade and increase the competitiveness globally is the use of modern information and communications technology. E-commerce as the most important outcome of this new technology and product can be a good opportunity for countries in domestic and international exchanges.

Today, with ever-increasing progress and dramatic growth of the modern communication tools and technologies and replacement of many of the traditional activities, in trade, moving from traditional commerce also towards a new trade (electronic trade) is occurring, as evidenced by figures and statistics on size of e-commerce, and its 20-25 percent the share of the total international trade and its predicted annual growth of about 54 percent.

In the meantime, countries have been able to take this opportunity to take the most benefit who are the provider and promoter new technologies and believe in competitiveness to participate in the markets (3).

2. Statement of problem and necessity of research

In today's world, information and communication technology and its applications have led to significant developments in the economic processes, so that some of the previous common routines are fully obsolete and replaced by the third millennium practices or the so-called virtual practices.

Export is no exception; e-commerce and ebusiness solutions are aimed to simplify and expedite the export process (4). E-commerce eliminates barriers of geography and the difference between day and night and promotes economic openness and communication at the national and international level. E-commerce changes direction of business thus shifting from traditional to newer markets. In this

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regard e-commerce as one of the most important tools greatly increases the efficiency indicators such as trade liberalization, transparency of information and the development of science, culture, business at the international level to gain competitive advantage and increase exports of the countries. It actually gives the leading countries a large competitive advantage. Iran's economy suffers from several problems, certain strategies have been proposed for developing countries; among them are strategies for export jump that balance the relative share of country of world's population and its relative share of world trade and ecommerce is one of the tools in this regard that can help the country and companies. Given the said items, e-commerce should be considered for the country and companies (5).

Given the above said, this research tried to study potentials of e-commerce (given the ability that this technology provides to manufacturers and companies that export food products) in terms of export of food products given our country's advantage in the field and its contribution to the economy of the country, thus focusing on the use of this part of the new information and communication technologies and e-commerce.

3. The objectives of the research

The overall objective of this research is identification of e-commerce capabilities in order of priority in terms of export of food products.

In this regard, the following subsidiary objectives will be pursued:

- 1- Study of extent of use by food products exporter companies the tools of e-commerce.
- 2- The role of e-commerce application to improve the efficiency of the export process and the increase in export earnings.

4. Theoretical framework

1-4. Export process

Exports of goods according to documents of the Trade Promotion Organization have been developed in a six articles as follows:

1 - preliminary stages, 2 - marketing, 3 - steps leading to the conclusion of the contract, 4 - before the customs formalities, 5 - customs formalities, 6 - transportation and bank affairs stage.

2-4. Concept of e-commerce

According to Turban, e-commerce is "buying and selling of goods, services and information via computer networks such as the Internet".

Chaffee describes e-commerce from a different perspective as follows:

Communication perspective: the transfer of information, goods, services or payment by electronic means

Timely view: buying and selling of goods timely.

Service perspective: a tool to simultaneously reduce the cost and increase the speed and quality.

Business process perspective: buying and selling of goods timely.

Organization for Economic Cooperation and Development defined e-commerce as: doing trade of goods and services through the World Wide Web (www) (whether those goods and services that can be offered and delivered through the World Wide Web or those that they do not have such capability. According to Report and Jaworski defined e-commerce as the exchange of technology between sectors (individuals or organizations) and electronic activities within the organization and between organizations that facilitates such exchanges (8).

3-4. E-commerce history

About 133 years after the invention of the telephone by Alexander Graham Bell, Bell's invention in 1876 provided foundation of e-commerce as is known today.

Some believe that the use of trivial number 0 in the calculations is the backbone of e-commerce, which comes from the Indian subcontinent. The use of electronic technologies in business is steeped in history. In fact, the need for e-commerce originates from private and public sector's demand for use of information technology in order to achieve customer satisfaction and effective coordination within the organization (9).

E-commerce in a way that today we know it have changed the way we work, and is rooted in the creative convergence of computer and telephone. Today, e-mails and information through search of web sites have become the most popular trading instruments. The ability is provided to people through effective and creative convergence of phone and computer that produces Internet. History of e-commerce in its modern form is rooted in two phenomena: the Internet and electronic data exchange, the source of both these phenomena can be traced to 1960 (4).

4-4. Internet's Impact on Industry Structure

Porter (2001) in his article titled "Internet and strategy" studied impact of the Internet on the industry structure. He argues that the Internet is creating new industries such as internet auctions and digital markets, but the greatest impact of the Internet is facilitating the industry, So that the high cost of communications, information collection or transactions that create restrictions on the industry was reduced. For example, distance learning industry that has come to existence for many years has received much influence from Internet but didn't create it. This is true of sale through catalog and Internet has just changed only its appearance (10).

The structural attractiveness of each industry, regardless of whether it is old or new, is defined by five main force of competition: the intensity of competition between existing companies, barriers to entry of new competitors, the threat of substitute products or services, the bargaining power of suppliers and bargaining power of buyers. These five factors divide economic value created by each product, service or technology among now existing customers, suppliers, new entrants and substitutes. Contrary to popular perceptions, increased speed of technological change makes the industry analysis more valuable, and despite all these changes these five forces are still determinants of profitability (11).

5-4. Role of e-business in foreign trade (Dunning selective model)

Another model that explains significant impact of e-business on exports and international trade is Dunning selective model (which is based on the selective model).

This model was first described by Dunning in 1976 who was the winner of Nobel Prize for Economics. This model states that the activities of international trade depends on the interaction of three sets of advantage.

- 1- Competitive advantage resulting from ownership: This advantage reflects the specific advantages of firms engaged in cross-border production activities, such as low price, advanced distribution system, extensive after-sales service and
- 2 Competitive advantage resulting from geolocation: This advantage is due to certain geographic location of company. For example, if a coffee-producing company is close to Brazil, which is the largest producer of raw coffee, this is a type of location advantages. Proximity to markets, raw materials, production resources, roads, etc., creates advantage.
- 3 Advantages arising from internalization: Process of internalization means that markets of a country accept the products of foreign countries as if they were the products of their country (12).

6-4. Impact of electronic commerce on the development of export

The question now is given what is the operational effect of concepts of electronic commerce on export process. Much research has been done in this regard that will be discussed.

E-commerce and globalization provide many challenges and opportunities for competition for large and small organizations. Small and medium-sized companies in particular are facing a new opportunity. Although more than half of the country's employment and the amount of added value come from these companies, they are not involved in e-commerce duly

and as much as they deserve. According to Anektad, the most important problem and obstacle that these companies are facing in exporting is lack of capital and adequate capacity and the complexity and difficulty of providing services on international markets. The Internet provides a number of efficient and economic ways to attract foreign customers and providing services to them that can be used for reducing the costs related to the geographical obstacles (13).

The global expansion of e-commerce has resulted an increase in exports via Internet. Export companies increasingly are trying to identify the potential of the Internet to strengthen the existing export activities and find new export customers. The Internet can be an effective tool in marketing for exporters. Effective use of the Internet is a low-cost way to enter global markets for companies that intend to enter the field of exports. This is especially for small and medium-sized companies and companies that are active in a small fraction of the global market. Theo States that to exporters lacking essential financial resources and human resources for marketing research, Internet provides opportunities to support competitive data collection activities in order to plan and create export strategies. The companies using the Internet not only can use it but also can benefit from it as an effective tool for global communication and enter into international transactions with customer in remote places (8).

Today, globalization has become an undeniable necessity for companies and countries. Although there is no single definition of globalization, but a major feature of globalization on which there is consensus is integration of economy, politics, environment, and social development. IT includes a variety of roles including production, distribution and consumption of information. These activities comprise diverse media ranging from radio to satellite and Internet (14).

Deschamp believes that in the context of globalization, development of information technology increases the richness of the information society. If various sectors of society, especially the commercial section enjoy the richness of the information sufficiently, it will be expected that the successful presence of companies and various sectors of the business community in the sphere of competition and global markets will realize (15).

As Figure 1 shows that all of these factors and their interactions ultimately lead to the development of exports. To put it more clearly, development of export is dependent on the richness of the information that is in turn dependent on the development of information and communication technology, and especially e-commerce.

Figure 1. The effect of information technology on the development of export

According to Lawrence, e-commerce contributes to export promotion through the following benefits:

- 1- Ongoing transformation of products and companies.
- 2 Specialization of corporation in terms of functions and not products (the theory of competitive advantage in international trade).
- 3 Replacing trade of inputs and intermediary services instead of the known products.
 - 4 Reorganization of industrial structure.
- 5 Downsizing companies and increasing their number contributes to globalization and global presence of active companies in third world countries and thus to the development of exports and the export process (16).

In his view, the economic impact of e-commerce also plays an important role in the development of Third World countries exports and increasing their global presence.

Economic factors causing this effect can be seen in the following cases:

- 1- Efficiency improvement, reducing production costs and thus reducing the pressure on prices and keeping inflation at a low level.
- 2 Entry of new companies to meet current demand.
- 3 Creating a dynamic and creative environment for the establishment and formation of new companies.
 - 4 Increasing completely new businesses.
- 5- Fuzzy concept of country of origin (for goods and services) (17).

One of the most important factors of the competitive advantage in international trade is transaction costs. According to James, e-commerce leads to the development of exports via the following factors:

- 1 Simplification and facilitation of the process of providing the required materials and parts of company from suppliers;
- 2 Providing new opportunities for the sale of certain products;
 - 3 Low-cost services in foreign markets;

4 - Time period of exchanges; this competitive advantage has a significant impact (18).

Figure 2. The effects of e-commerce on the development of export

5. Hypotheses

According to the literature and theories that have been raised about the potential effects of e-commerce on exports, the following hypotheses were proposed:

5-1. Main hypothesis

There is a significant relationship between use of e-commerce and improved export performance of companies producing food products.

5-2- Secondary hypotheses

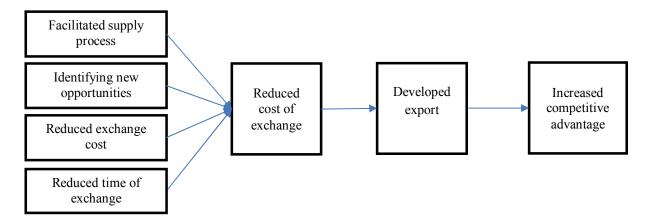
- 1. There is a direct and significant relationship between use of e-commerce and improved efficiency of companies producing goods for export.
- 2. There is a direct and significant correlation between use of e-commerce by companies producing food products and increased export earnings.
- 3. There is a direct and significant correlation between use of e-commerce and reduced the cost of export of enterprises producing food products.

6. Research Methodology

This was an applied research in terms of objective and in terms of data collection, it was a descriptive-survey study, because based on the collection and analysis of secondary data from literature, variables and indicators were identified and then through Questionnaire of beliefs and opinion of group, primary data were collected, and the end result was extracted. Thus the result was of this process was identifying the impact of e-commerce on the export of food products.

6-1. Statistical population and sample

The population of this research included companies producing food products that include 129 companies in 2015. In this research, to estimate the company producing food products, Bernoulli's formula of the binomial distribution was used and sample size was 170/87. In order to reduce the possibility of sampling error the sample size, sample size of 90 was used. Having administered and collected the questionnaires, the data were analyzed using SPSS software.



6-2. Data collection instrument

The researchers used a questionnaire as a measuring tool and to measure the variables, an ordinal scale was used. For this purpose, initially through exploratory interviews with several experts, specialists, and scholars in e-commerce and studying of books, articles and research in this field, a number of indexes were collected for preparing questionnaire, and in fact 24 indicators for the study of role of e-commerce in exports were used.

Overall, each choice was considered on a fivepoint Likert scale (one denoting very low to five denoting very high). It should be noted that the said criteria were obtained in a preliminary study after exploratory interview and referring to advisor and consulting professors.

6-3. Validity and reliability of questionnaire

To check narrative validity of content of questionnaire, face validity was used, which means use of opinion of professors and experts of export and e-commerce.

Reliability of questionnaire was checked through internal consistency using Cronbach's alpha

coefficient and for the 24-item questionnaire, it was obtained to be 0.922, which showed that the reliability is acceptable.

6-7. Data analysis

In this research, descriptive and inferential statistics such as analysis of variance and Student's t test and one-sample binomial test and Friedman test were used.

7. Analysis of research data

7-1. Main hypothesis testing

This hypothesis concerned the presence or absence of a relationship between the use of e-commerce and export companies' performance. In other words, the null hypothesis and alternative one are as follows:

H0: use of e-commerce by company is independent of export performance.

H1: use of e-commerce by companies has an effect on export performance.

To test the above hypothesis, we can binomial test, in which obtained results were obtained in comparison to score (3 as average level). Results are shown in table (1):

Table 1. Statistical test results

Factor		Grouping	Number	Observed ratio	Test ratio	Sig.
Improved over out norformen as	1st group	<=3	10	0.11	0.50	0(a)
Improved export performance	2nd group	>3	80	0.89	-	-
	Total		90	100	-	-

According to the results of statistical tests and given the significance observed was equal to zero and was less than significance level of 0.05, null hypothesis was rejected with 95 percent confidence level and alternative hypothesis, namely the use of e-commerce has an effect on the export performance was accepted.

7-2. Test of the first secondary hypothesis

H0: use of e-commerce by company has no effect on improving the efficiency of export process.

H1: use of e-commerce by company has an effect on improving the efficiency of export process.

One-sample t-test results on variable of export performance improvement of company are shown in the table 2:

Table 2. Statistical test results

Factor		Test value 3	3						
Improved e	export	Sample	Mean	Mean DoF t Sig. Mean difference			Approximate confidence of 95%		
performance	_	size					difference	Low	High
		90	3.6431	0.61116	89	10.253	0.000	0.5325	0.7385

According to the results of statistical tests and given the significance observed was equal to zero and was less than significance level of 0.05, null hypothesis was rejected with 95 percent confidence level and alternative hypothesis, namely the use of ecommerce has an effect on the export improvement was accepted.

7-3. Test of the second secondary hypothesis

H0: use of e-commerce by company has no effect on increased export revenues.

H1: use of e-commerce by company has an effect on increased export revenues.

One-sample t-test results on index of export's increased revenues of company are shown in the table 3:

Table 3. Statistical test results

factor	Test value 3									
Increased export	Sample size	Mean	DoF	t	Sig.	Mean difference	Approximate confidence 95%	of	Approxim confidence Low	
revenue	90	3.7759	0.61012	89	12.06	0.000	0.77594		0.6452	0.9037

According to the results of statistical tests and given the significance observed was equal to zero and was less than significance level of 0.05, null hypothesis was rejected with 95 percent confidence level and alternative hypothesis, namely the use of ecommerce has an effect on the export revenues was accepted.

7-4. Test of the third secondary hypothesis

For the third secondary hypothesis, namely, use of e-commerce by company has an effect on reduced

export costs, null and alternative hypotheses are as follows:

H0: use of e-commerce by company has no effect on reduced export costs.

H1: use of e-commerce by company has an effect on reduced export costs.

One-sample t-test results on index of reduced export costs of company are shown in the table 4:

Table 4. Statistical test results

Factor			Tes	st value 3						
	of	Sample size	Mean	DoF	t	Sig.	Mean difference	Approximate confidence of 95%	Approxim confidence Low	
export proces	33	90	3.5349	0.73550	89	6.900	0.000	0.53495	0.3809	0.6890

According to the results of statistical tests and given the significance observed was equal to zero and was less than significance level of 0.05, null hypothesis was rejected with 95 percent confidence level and alternative hypothesis, namely the use of ecommerce has an effect on reduced export costs was accepted.

7-5. Ranking of the three factors of potentials of e-commerce

In this section, to rank the three factors of potentials of e-commerce including improved export efficiency, increased export revenues and reduced export costs, Friedman test was used. Null and alternative hypotheses are as follows:

H0: There is no significant difference between three factors of potentials of e-commerce.

H1: There is a significant difference between three factors of potentials of e-commerce.

Table 5. Ranking of the three factors

Sig.	90
DoF	2
Sig.	0

According to the results obtained from the table (5), it can be observed that in the section related to test statistic, it is equal to zero, which will cause rejection of the null hypothesis, which means that these indicators have different significance and does not have identical significance.

As displayed in table 6, the highest ranking corresponds to the increase of export earnings with the mean rank of 2.31 and the second ranking corresponds to improved export efficacy, with mean rank of 1.98. Reduced export costs had mean rank of 1.72.

Table 6

Rank	Three factors of impacts of e-	Mean of
Kalik	commerce	ranks
1	Increased export earnings	231
2	Improve efficiency of export process	191
3	Reduced export costs	172

8. Results

According to the 24 items (indexes) of questionnaire in the form of one main hypothesis and three subsidiary ones that were derived from the literature, the following results can be obtained:

- 1 Among the companies exporting food products, according to respondents, the use of ecommerce is effective in improving export performance.
- 2 Among companies exporting food products, according to respondents, the use of e-commerce is highly effective in improving export performance.
- 3 Among companies exporting food products, according to respondents, the use of e-commerce is effective in increasing export earnings.
- 4 Among companies exporting food products, according to respondents, the use of e-commerce is effective in reducing export costs.
- 5 Given the results of the present investigation indicate the enormous impact of electronic commerce on the amount of export of food products by exporter companies in different aspects, which requires more attention of existing companies in the industry to exploit the new technology to enhance the competitive ability at international level and enjoy the benefits of it.

9. Research limitations

- 1 Since the sample comprised companies exporting food products, more extensive research is needed. In addition, the scope of this study included research on companies exporting food products, which makes generalization and study of e-commerce's effect on other industries.
- 2 E-commerce has been in Iran for a short period, which also limited the study period, and was

one of limitations of the research. So the study can continue by adding valuable cases to it.

- 3- Another limitation of the research related to the fear of food industry professionals and experts for responding to the questionnaire and the respondents' lack of trust towards the target of model and it is apolitical nature, therefore, result may lose it power of formulation of exact problems.
- 4- Given limitation of time and financial limits in this research, only 24 effects of the application of ecommerce on the export were studied, which was another limitation.

10. Suggestions

These suggestions were divided to applied and research ones with regard to the results obtained from the research and test of hypotheses.

10.1- Applied suggestions

1. Given the main hypothesis (there is a significant and positive relationship between the use of e-commerce and improved the export performance) was accepted, it is suggested that interest people deploy and make appropriate use of e-commerce in the process of exporting.

Given the results of the investigation, the highest calculated t related to the impact of the use of ecommerce on factor of improved efficiency of export process, which indicates that use of e-commerce had the highest effect on increased export revenues. Therefore, it is suggested that more attention is paid to this factor.

- 3 Given the results of the research the lowest t calculated related to the impact of the use of ecommerce on the export cost reduction; thus it is recommended for interested people to adopt the necessary measures.
- 4- Friedman test suggests that the use of ecommerce had the greatest influence on providing of better services to the customers among components of improved export efficiency.
- 5- Friedman test suggests that the use of ecommerce had the most impact on establishing and maintaining long term relationships with customer and as a result on the creation of loyalty and increasing sales and earnings of the company among constituents of increased export revenues, it is recommended that more attention be paid to this factor.
- 6- Friedman test suggests that the use of ecommerce had the greatest influence on reduced cost of communication of company, among components of reduced cost of export, therefore, it is recommended that more attention be paid to this factor.

10.2. Suggestions for future researches

The aim of the present research was study of the role of e-commerce in export and it would be recommended that research in the future in the field be conducted the impact of e-commerce application on

other areas such as supply chain management, customer relationship management, corporate culture and performance.

Here, only 24 effects of e-commerce on export was study, thus other effects should be studied in future.

Here, only a particular time period was studied, other periods can be used in other researches given variables and indices of this research, and study can be done on such effect during studied time.

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