

## An E-Commerce SWOT Analysis for Export of Agricultural Commodities in Iran

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### ABSTRACT

Electronic commerce (E-commerce) is a contemporary concept with huge potential that is fundamentally changing how business is done. This paper describes robust E-commerce strategies for trading agricultural goods and services. The purpose of this study was to enhance the efficiency of E-commerce in the export of agricultural commodities. Since the SWOT method is a key tool used by businesses to formulate strategic plans, this study conducted a SWOT analysis of E-commerce to identify the strengths, weaknesses, opportunities, and threats faced by E-commerce in current scenarios. A random sampling method was used to select the statistical population, which was composed of 96 experts from the Ministry of Agriculture. Seventy-five questionnaires were distributed to the experts (N= 75) using Morgan and Krejsi's table, of which 59 questionnaires were filled (n= 59). The questionnaire consisted of strengths, weaknesses, opportunities, and threats to E-commerce development and it was prepared using the Delphi technique. The important results of SWOT analysis constituted a framework to help planners and managers realize their goals and enhance the export of agricultural commodities. The resulting SWOT matrix analysis was located in the area of WO (conservative strategy). Accordingly, it is recommended that for proper exploitation of environmental opportunities, organizational weaknesses should be taken into account. Some important strategies suggested based on this study are enforcing laws and providing effective incentives to reduce production costs relative to global prices as well as creating innovation in the export process using E-commerce.

**Keywords:** Agricultural export, Delphi technique, Electronic commerce, Morgan and Krejsi's table.

### INTRODUCTION

Recent experiences in Iran point to instability in export earnings arising from a reliance on crude oil sales for economic income. Therefore, to reduce the dependence of Iran's economy on crude oil exports and to shift towards a multi-product export economy, it is imperative to consider profitable export products such as agricultural commodities (Dhanashri Patil, 2014). For example, some profitable exporting products in Iran include saffron, pistachio, and apples (Amirteimoori and

Chizari, 2008; Hosseini *et al.*, 2003). Since E-commerce is one of the main channels for the export of agricultural products, it is therefore important to invest in it. In other words, E-commerce is a notable and promising example of Information and Communication Technology (ICT) that can contribute to economic growth and can radically transform how business is done (Jeethesh Dsouza and Joshi, 2014; Mohammadi *et al.*, 2018). One of the most important instruments of each community for survival is competition. E-commerce has provided this opportunity since it has

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provided a means of saving time and labor and facilitated the search for new products. Moreover, with the help of E-commerce, the required paperwork is vastly reduced since the safety of document archiving is ensured. Also, E-commerce is a solution for office automation because it reduces the use of space, manpower, and recording costs (Hetampur, 2011). Thus, it is increasingly important to understand and identify the strengths (the characteristics of a business or project that gives it an advantage over others), weaknesses (the characteristics of a business that places the business or project at a disadvantage relative to others), as well as the opportunities (the elements in the environment that a business or project could exploit to its advantage), and threats (the elements in the environment that could pose trouble for a business or project) of E-commerce (Kiran and Sharma, 2014; Zhu *et al.*, 2002). SWOT is a technical instrument that can be used to identify, understand, and evaluate the strengths, weaknesses, opportunities, and threats of E-commerce. The SWOT analysis of E-commerce can help business managers gain insight into existing or potential problems (Nouri *et al.*, 2008; Sabha, 2017; United States, 2008). Information that is derived from SWOT analysis consists of internal issues (strengths and weaknesses) and external issues (opportunities and threats). SWOT is a candidate model that identifies the availability of potential opportunities and threats as well as what a business can and cannot do (Sammut-Bonnici and Galea, 2015). In other words, SWOT analysis determines what can assist companies in accomplishing their objectives and what obstacles should be overcome or minimized to achieve their targets (Sabha, 2017). To illustrate this, the following sections discuss the strengths and opportunities (Section I) as well as weaknesses and threats (Section II) of E-commerce.

## Section I: Strengths/Opportunities

The basic idea of E-commerce is that innovation resources improve certain aspects of productivity that affect firms in terms of internationalization, profitability, and growth. It is estimated that E-commerce activities will be a key indicator of agricultural development in the next decade (Liu *et al.*, 2013; Uzoka *et al.*, 2007). This will open new markets and create opportunities to increase production (Alarcón and Sánchez, 2016; Kiang and Chi, 2001; Totonchi and Kakamanshadi, 2011). For developing countries, E-commerce represents a compelling strategy and is a promising opportunity for economic development (Albastroiu, 2007; Rillo and Dela Cruz, 2016). Developing countries need to create and exploit new economic opportunities. E-commerce practices are adopted mainly to achieve the following objectives: promotion of economic growth, social development, enhancement of business efficiency and productivity, and a decreased cost of doing business (Albastroiu, 2007). In recent years, E-commerce of agricultural commodities has developed rapidly. In this way, many classic cases and business models including tootoo industrial commune model, original life model and Suichang model have emerged to develop the process of E-commerce of agricultural commodities (Huo and Mu, 2017). It has been pointed out that the research of agricultural commodities E-commerce has mainly focused on the basic research (Wen, 2007), development strategy, operation mode and comparison of agricultural commodities, agricultural products supply chain and agricultural commodities logistics. Moreover, Helander (2000) reported that inductive E-commerce of agricultural commodity transaction costs, such as, distribution costs and transaction costs of contracting agricultural E-commerce applications, can not only change the sales pattern and adjust the market structure of agricultural commodities

(Helander, 2000), but it can also improve the competitive advantage of agricultural products (Bao and Huang, 2012). According to Chen and Zhang (2015) and Currie (2000), there are many benefits of E-commerce, such as reduction of external and internal communication expenses (reduction of administrative tasks and the speed-up of business processes) as well as revenues generated either from current business or new initiatives that enhance the visibility of companies and supplier networks. According to Zhu and Zou (2014), E-commerce has tangible benefits such as cost reduction and increased flexibility in working practices. In addition, some studies (Alarcón and Sánchez, 2016; Cosgun and Dogerlioglu, 2012; Kiang and Chi, 2001; Zhu *et al.*, 2002) found five critical methods to increase E-commerce efficiency, including strengthening supply chains based on the reduction of supplier costs and vertical integration, providing a large array of products and services, making transactions convenient for consumers, helping consumers save time, and reducing information asymmetry between parties. Furthermore, four influential means were found to enhance the productivity of E-commerce: rewarding customers for their loyalty, personalizing products or

customizing services, building virtual communities, and establishing a reputation for trust in transactions (Fels *et al.*, 2017; Kiang and Chi, 2001; Wen, 2007). Other researchers (Awais and Samin, 2012; Dhanashri Patil, 2014; Kiang and Chi, 2001; Kiran and Sharma, 2014; Zhu *et al.*, 2002) have reported SWOT analysis of E-commerce strengths and opportunities. Strengths included the removal of boundaries (global locations), time-saving, cost-effectiveness, direct communication with consumers, improved customer interaction, lower transaction costs, faster purchase procedures, etc. Opportunities were new technologies, high (round the clock) availability, cutting down on local competition, etc. Based on the literature review in Section I, the strengths and opportunities of existing systems are summarized in a Table 1.

## Section II: Weaknesses/Threats

Organizations that use Internet tools to support their business processes are increasingly facing the challenge of E-commerce (Oluwaseun, 2013). One key reason that many consumers use the Internet but do not make purchases online is a

**Table 1.** A summary of strengths and opportunities of trading agricultural commodities.

Strengths	Opportunities
Decreasing cost of doing business and sales pattern	Opening new markets
Enhancing business efficiency and productivity	Creating opportunities to increase production
Adjusting the market structure of agricultural commodities	Promoting economic growth
Improving the competitive advantage of agricultural products	Social development
Reducing external and internal communication expenses	Providing a large array of products
Cost reduction and increased flexibility in working practices	Providing a large array of services
Removal of boundaries (Global locations)	Making transactions convenient for consumers
Time-saving	Helping consumers save time
Cost-effectiveness	Reducing information asymmetry between parties
Direct communication with consumers	Opportunities of new technologies
Improved customer interaction	High (round the clock) availability
Lower transaction costs	Cutting down on local competition
Faster purchase procedures	



mistrust in the safety of conducting business over the Internet (Velmurugan, 2009). The main reason for companies to avoid online marketing is uncertainty as the Internet is a new transaction channel (Kiang and Chi, 2001; Overby and Jap, 2009). According to a survey by Information Systems Audit and Control Association (ISACA), security, risk management, and trust are key problems in the E-commerce world that directly or indirectly have significant effects on trust (Canavari et al., 2010; Lee et al., 2018). Therefore, trust management systems can help reduce risk (e.g., ID theft) and make it easier for users and agents to interact with one another in a low-risk environment. Because of the unique characteristics of virtual shopping environments (i.e., inability to directly see and touch a product and an absence of face-to-face interactions), consumers face uncertainty and heightened risk in their online buying decisions. In some papers (Bhattacharjee, 2002; Mazhar et al., 2012; Patton and Jøsang, 2015), it was explained that the uncertainties inherent in the current E-commerce environment give rise to a lack of trust and reliability in E-commerce partnerships, thereby reducing confidence and creating barriers to trade. For instance, in Latin America, a low rate of credit card usage can be attributed to a “lack of trust” in the credit card system rather than “lack of access” to the system (Wandoko et al., 2017). As a result, trust is one of the most effective tools for reducing uncertainty and risk (Frederiksen, 2014; Vos et al., 2014). Since 1995, the development of IT has fostered an excellent environment for the expansion of technology in Iran, creating a dramatic increase in IT adoption. For instance, Iran had been heavily investing in the development of Internet and electronic banking (E-banking) among governmental institutions and the private sector when compared to other Middle Eastern countries (Kamalabadi et al., 2008; Salehi and Alipour, 2010; Sarlak et al., 2009). Some researchers have examined the influence of E-banking on the adoption of E-commerce. Some aspects of the Internet banking that

influence the adoption of E-commerce include time-saving (DeYoung et al., 2007), the reduction of cost and overhead expenses, particularly those pertaining to the maintenance of physical branches, marketing and work (Chang, 2002), the enhancement of mass customization, marketing and communication activities, and the maintenance and attraction of consumers (Mols, 2000; Sheshunoff, 2000). Findings in Iran (Alizadeh et al., 2018) have indicated that ease of use, Website content, accessibility, privacy, transmission speed, and security have positive effects on the adoption of the Internet banking. The Internet technology has influenced the banking systems (Barkhordari et al., 2017) because of its capability to enhance the performance of financial operations. As a result, the Internet banking and online payment can influence E-commerce adoption. However, E-commerce expansion rates have been moderate or low. In other words, E-commerce as a source of competitive advantage in many business environments, especially agriculture companies (Cai et al., 2015; Canavari et al., 2010), is lagging behind, and more investment is required for its development. Moreover, according to a survey on agricultural marketing, agricultural marketing channels are inefficient and producers have a low share in consumer price (Anviah Takieh, 2002; Ghorbani, 2008). The adoption of E-commerce applications has been largely influenced by factors related to technical and infrastructural factors as well as organizational attitudes and cultural factors (Datta, 2012; Taheri 2012). Companies are not equally inclined to develop and deploy new IT technology due to the hurdles and challenges of E-commerce. A literature review focused on barriers to E-commerce. (Kamalabadi et al., 2008; Sherafati et al., 2014), determined three main challenges to E-commerce implementation in Iran, including social and cultural factors, managerial factors, and technical factors. Some other researchers (Lawrence and Tar,

2010) brought up three main important barriers to E-commerce, including technological factors (perceived benefits), organizational factors (organizational readiness), and environmental factors (external pressure). For example, a study of the implementation of E-commerce in Iranian SMEs indicated that factors like human resource development, education and management, production scheduling, foreign relation management, communication systems, and financial management were critical causes of failure (Amiri and Salarzahi, 2010; Sherafati *et al.*, 2014). Moreover, Hosseini *et al.* (2012) and Sherafati *et al.* (2014) emphasized the low internet speed, lack of security, and lack of E-commerce specialists as technical challenges to E-commerce. Beside various technical obstacles, other issues including online trading security, authentication, and tax policies have yet to be overcome (Kiang and Chi, 2001; Lawrence and Tar, 2010). Moreover, lack of trading partner readiness is a significant inhibitor (Kshetri, 2007; Zhu *et al.*, 2002). Also, the high costs associated with E-commerce, lack of technical resources and expertise related to E-commerce, difficult E-commerce technology, and complexity in measuring return on investment were other barriers to E-commerce adoption (Almoussa, 2013; Robert and MacGregor, 2005).

Since the efficiency of E-commerce is enhanced by focusing on the straightness of E-commerce (reducing weaknesses) and emphasizing E-commerce opportunities (minimizing or removing barriers), based on the review of the literature, we aimed to investigate the SWOT of E-commerce for

exported agricultural commodities in Iran.

## MATERIALS AND METHODS

SWOT analysis is a strategic planning and marketing tool used for regional assessment. In fact, it is an instrument that is generally used to place the analysis of external pressures (opportunities and threats offered by the outside region) besides internal capacities (strong and weak points inside the region) (Gretzky, 2010; Kazemiyeh *et al.*, 2016). SWOT was used to provide a matrix of strategies. Table 2 schematically illustrates the framework of the SWOT model.

An appropriate SWOT analysis was designed in the form of tables and its stages were as follows:

- Providing a list of opportunities, threats, strengths, and weaknesses in the form of tables. (Tables 3 and 4)
- Explaining and interpreting each opportunity, threat, strength, and weakness.

The SWOT analysis technique was used to indicate the current constraints and future possibilities of E-commerce for the export of agricultural commodities in Iran. In this research, the random sampling method was used. The statistical population was composed of 96 experts from the Ministry of Agriculture. Seventy-five questionnaires were distributed to the experts (N= 75) using Morgan and Krejsi's table, of which 59 questionnaires were filled (n= 59). The questionnaire was the main research instrument to collect data. All items of the

**Table 2.** SWOT matrix of E-Commerce analysis for export of agricultural commodities.

	Strengths	Weaknesses
Opportunities	S-O strategies <sup>a</sup>	W-O strategies <sup>b</sup>
Threats	S-T strategies <sup>c</sup>	W-T strategies <sup>d</sup>

<sup>a</sup> What Strengths do we have and how can we use them to take advantage of new or existing opportunities?

<sup>b</sup> What strategies are needed to overcome weaknesses so that we can take advantage of opportunities?

<sup>c</sup> What Strengths can be used to minimize Threats?

<sup>d</sup> What strategies will minimize weaknesses and help us cope with Threats?

**Table 3.** Characteristic of external factor evaluation (EFE) Matrix.

E-commerce opportunities in exporting agricultural products	Average (n= 59)	Relative weight
Coordinating with the changing trend of buyers	4.16	0.106
Cost-effectiveness of E-commerce in the export process	4.81	0.123
Creating a positive attitude toward E-commerce in the Ministry of Jihad-e-Agriculture	3.84	0.098
Creating innovation in the export process using E-commerce	4.05	0.103
Customer satisfaction	3.77	0.096
Direct communication with the consumers	4.01	0.102
Easier exchange methods	3.71	0.095
E-commerce flexibility	4.06	0.104
E-CRM Customer Relationship Management	3.91	0.100
Emphasizing products with relative advantage and off-season to maintain export target markets	4.08	0.104
Establishing companies in support of E-commerce services	3.69	0.094
Existence of diversity in the interests of global consumers with regard to the climate of Iran	3.5	0.089
Extending global interactions	3.93	0.100
Extensive business growth	3.94	0.101
Government's determination to develop non-oil exports	3.86	0.098
Having high business efficiency	4.06	0.104
Having high information efficiency	3.77	0.096
High demand for global and regional markets for agricultural commodities	3.67	0.094
Improving customer engagement	3.81	0.097
Improving productivity	3.72	0.095
Increasing exports	4.03	0.103
Increasing exports, employment and production	4.16	0.106
Increasing financial opportunities	3.98	0.102
Interaction with regional and international E-commerce centers for the exchange of information and services	3.84	0.098
Making culture through advertising, media, etc. for the application of E-commerce in agricultural commodities	3.89	0.099
New markets, new customers, and competitive advantages	3.81	0.097
Raising the level of advertising and public awareness	3.71	0.095
Reducing local competition	3.93	0.100
Reducing operational costs	3.44	0.088
Removing world trade barriers	3.86	0.098
Saving time	3.79	0.097
Speeding up the swap	4.2	0.107
Strengthening Iran's competitive position in the world	3.98	0.102
The possibility of attracting foreign investment in E-commerce	3.72	0.095
Top 24/7 access	4.01	0.102
Unlimited time (availability all the time)	4.1	0.105
Using educated agricultural labor force in agricultural exports	3.72	0.095
Using new technologies in export	3.98	0.102
Utilizing the role of advertising by providing brochures on agricultural products on the Internet	4.08	0.104
Total average	3.912	-----
Total cumulative average	-----	3.912
E-commerce threats in the export of agricultural products	Average (n= 59)	Relative weight

Continued...

Continue of Table 3. Characteristic of external factor evaluation (EFE) Matrix.

E-commerce opportunities in exporting agricultural products	Average (n= 59)	Relative weight
Changes in the environment, law and regulations	3.5	0.085
Creating new business rivals	3.47	0.084
Existence of commercial fraud	4.08	0.099
Existence of fake websites	3.91	0.095
Failure to accept electronic documents by the judiciary (with credit equivalent to paper documents)	3.86	0.094
Failure to create a legal information system and define intellectual property rights	3.76	0.091
Failure to introduce the authority to issue a digital signature certificate in the country and confirm the authentication of the buyer and seller	3.93	0.095
Failure to legislate domestic laws that are consistent with international unions	3.89	0.094
Failure to provide information security	3.91	0.095
Failure to set up fast and reliable communication lines	3.81	0.092
Fierce competition in the supply of agricultural products in global markets	3.86	0.094
Future legal requirements	3.81	0.092
High advertising costs	3.57	0.087
Improper brand name	3.59	0.087
Inappropriate cooperation of foreign financial institutions and banks with exporters	4.37	0.106
Incomplete policy making and planning	3.98	0.097
Increasing global health indicators on production	3.77	0.091
Increasing illegal and legal importing licenses	3.49	0.085
Insecurity in banking interactions	3.81	0.092
Investment weakness	4.03	0.098
Lack of a business-friendly model to help develop E-commerce	3.84	0.093
Lack of a legal framework for E-commerce	3.84	0.093
Lack of a secure government system to gain confidence in having online business	3.83	0.093
Lack of a unit of agricultural products in the stock exchange	3.94	0.096
Lack of active private sector	3.66	0.089
Lack of attention of exporters to customer satisfaction	3.94	0.096
Lack of budget in establishing E-commerce in the company	4.13	0.100
Lack of effective management system with a trustee in E-commerce	3.96	0.096
Lack of experienced managers	3.72	0.090
Lack of familiarity with global markets	4.15	0.101
Lack of personal service	4.05	0.098
Lack of proper information systems	4.15	0.101
Lack of proper packaging compared to competitors	3.45	0.084
Lack of using E-business capable staff in exporting companies	3.93	0.095
Long delivery time	3.96	0.096
Need for additional funds in the adoption of E-commerce at the onset of the work	4.4	0.107
Non-defining individual rights in relation to the confidentiality of personal information	4.47	0.109
Non-membership in the WTO and strong regional organizations	4.03	0.098
Not using modern technologies to accelerate international trade	3.94	0.096
Weak marketing infrastructure	3.66	0.089
Worrying about collapse of privacy	4.27	0.104
Total average	3.9092	-----
Total cumulative average	-----	3.9092

**Table 4.** Characteristic of Internal Factor Evaluation (IFE) Matrix.

	Average (n= 59)	Relative weight
<b>E-commerce strengths in exporting agricultural products</b>		
A way for buying faster and easier	3.18	0.227
Access to appropriate distribution networks for agricultural products	3.32	0.237
Application of coding system for agricultural commodities	3.74	0.267
Climatic variation in agricultural production	3.59	0.256
Comfortable introduction of export agricultural commodities	3.64	0.26
Comparison of prices and varieties of agricultural products	3.45	0.246
Division of target markets in the export of agricultural products	3.61	0.257
Establishing a system for the exchange and tracing of products on their way to target markets	3.66	0.261
Establishment of appropriate contracts with chain stores in target countries for export crop	3.44	0.245
Existence of relative advantage in the production of some commercial products	3.64	0.26
High production potential in export agricultural commodities	3.76	0.268
Monopoly on production in export of some agricultural commodities	3.05	0.217
No need for the physical launch of agricultural exporters	3.49	0.249
The absence of commercial boundaries in the electronic trading of agricultural products	3.38	0.241
Total average	3.4964	-----
Total cumulative average	-----	3.4964
<b>E-commerce weaknesses in the export of agricultural products</b>		
Constraints on the testing of the physical quality of agricultural products	3.3	0.137
Disregarding market preference in the production of agricultural products	3.94	0.164
Failure to create a standard agricultural product code assignment system	3.52	0.146
High cost of final products compared with global prices	4	0.166
Higher transportation cost of agricultural products in E-commerce	3.84	0.16
Inadequacy of information on the developments of target markets in the export of agricultural products	3.27	0.136
Inappropriate banking system for exporting agricultural products	3.94	0.164
Lack of a unit of agricultural products in the stock exchange	3.44	0.143
Lack of active presence of exporters at national and international exhibitions	3.38	0.140
Lack of familiarity of exporters with modern advertising techniques	3.96	0.165
Lack of planning and coordination between trusted agencies in agricultural exports	3.94	0.164
Lack of proper infrastructure for export of agricultural commodities	3.72	0.155
Lack of specialized software and statistics on agricultural products and demand	3.89	0.162
Lack of subsidies and export facilities to exporters	3.23	0.134
Lack of supply chain of agricultural commodities with a comprehensive “farm to fork” plan	3.64	0.151
Lack/weakness of trade associations (E-commerce) for production and trade of agricultural products	3.86	0.160
Limitation of advertising agricultural products in E-commerce	3.66	0.152
Limitation of target markets for agricultural exports	3.62	0.150
Non-comprehensive look at the policy of developing export of agricultural products	3.61	0.150
Non-specialized agricultural products in return with global standards	3.91	0.162
Restrictions on agricultural products displayed on the site	4.66	0.194
Weak standards in agricultural production	4.03	0.167
Weakness in the implementation of supportive policies in exporting agricultural products	3.86	0.160
Weakness of marketing operations in exporting agricultural products	4	0.166
Total average	3.7591	-----
Total cumulative average	-----	3.7591



questionnaire were selected on a five-point Likert scale (1= Very low, 2= Low, 3= Medium, 4= High, and 5= very high). A list of strengths, weaknesses, opportunities, and threats to E-commerce development was prepared using the Delphi technique by reviewing the opinions of 15 experts from the Organization for Development and Trade, 10 experts from the Office for Export Development of Commodities in the Ministry of Agriculture, and 20 experts from the AREEO (Agricultural Research, Extension and Education Organization), five E-business experts from the Ministry of Agriculture, eight professors from the Department of Economics and Agricultural Education and Agricultural Education at Tarbiat Modares University, as well as a review of secondary resources. The final questionnaire included four sections (strengths with 14 questions, weaknesses with 24 questions, opportunities with 39 questions, and threats with 41 questions) with predefined intervals. Then, the respondents were asked to answer the questionnaire based on their opinions about the internal and external factors affecting E-commerce in the field of exported agricultural commodities. SPSS software was used to analyze the data.

This study was composed of the following phases:

Designing external and internal factor matrices;

Analyzing SWOT matrix (space matrix),

Prioritizing identified strategies.

## RESULTS AND DISCUSSION

### Designing External and Internal Factors Evaluation Matrix

At this phase, the matrices of External Factor Evaluations (EFEs) and Internal Factor Evaluations (IFE) that affected the E-commerce system of agriculture export products was designed based on the strengths, weaknesses, opportunities, and threats of the prioritizing questionnaire. The EFE matrix evaluated opportunities and threats, while the IFE matrix evaluated strengths and weaknesses (David *et al.*, 2009; Zulkarnain *et al.*, 2017). The items were individually evaluated and ranked. The

coefficient of importance ratio was identified using a panel of experts. EFE matrices are presented in Table 3. As indicated in Table 3, cost-effectiveness of E-commerce in the export process, speeding up the swap, and coordinating with the changing trend of buyers in E-commerce are the most important E-commerce opportunities for exporting agricultural products. Also, the reduction of local competition is one of the least important E-commerce opportunities for exporting agricultural products (Table 3). This finding suggests that issuers' managers do not care much about the opportunities created through the domestic market by gaining more share of global markets. Moreover, the analysis of threats to E-commerce in agricultural exports shows that unclear individual rights about the confidentiality of personal information, the need for additional funds in the adoption of E-commerce at the onset of the work, and inappropriate cooperation of foreign financial institutions and banks with exporters (Table 3) are among the most important threats to progress. On this basis, it can be said that effective organizations in E-commerce have not seriously addressed the issue of E-commerce training and familiarizing exporters with E-commerce and have not set up a single document for them. Therefore, with changes in global markets, exporters are somewhat confused and inconvenient to deal with the issue. On the other hand, the lack of proper packaging in comparison with global competitors has made the market more attractive and customer satisfaction and their loyalty to re-purchase the Iranian brand is unlikely to lead to the loss of business opportunities in global markets. According to analysis of external factor identification in Table 3, the relative weight of the opportunities (3.912) was deducted from the relative weight of the threats (3.9092) to yield the external factor score (0.0028). Its positive sign indicates that the opportunities of advanced electronic trade in exporting agricultural commodities were greater than its threats. Evaluating the ranking of E-commerce strengths in agricultural exports using the relative weight of each item (Table 4) suggests that high production potential in export of agricultural commodities, application of coding system for agricultural commodities as well as establishing a system for the exchange and tracing of

products on their way to target markets are the most important strengths of E-commerce in exporting agricultural products. However, unclear individual rights about the confidentiality of personal information, the need for additional funds in the adoption of E-commerce at the onset of the work as well as inappropriate cooperation of foreign financial institutions and banks with exporters are the most important weaknesses of E-commerce in agricultural exports.

The first part of SWOT analysis depends on external issues that cannot be controlled but can be managed to enhance or reduce their business impact. The EFE matrix is a good management tool that is often used to check current business conditions by visualizing and prioritizing opportunities and threats. The benefits of external analysis include higher managerial awareness of environmental changes, better resource allocation, and facilitated risk management (Amoozad Khalili and Maleki, 2011; Riston, 2008).

The EFE matrix was processed through the following steps:

Gathering a list of external factors and dividing them into opportunities and threats;

Calculating the average value of the existing factors;

Calculating the relative weight of each factor (cumulative average/total),

Summing the relative weights of all factors.

The IFE matrix is a kind of strategic

management tool used to evaluate the strengths and weaknesses of functional business areas. The IFE matrix and EFE matrix were combined into a strategy-formulation tool to evaluate the performance of a company to identify the internal strengths and weaknesses of a company. The IFE matrix was created using the following steps:

Identifying key internal factors including strengths and weaknesses;

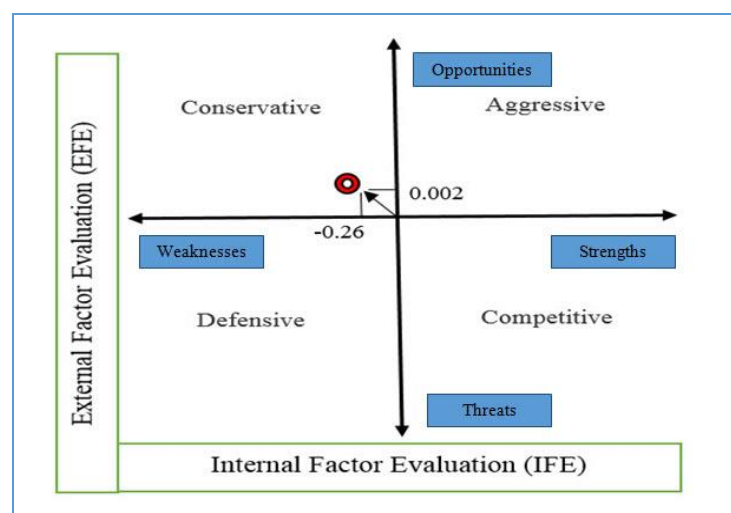
Calculating the average value of existing factors;

Calculating the relative weight of each factor (cumulative average/total),

Summing the relative weights of all factors.

According to the internal factor identification in Table 4, the relative weight of the weaknesses (3.7591) was deducted from the relative weight of the strengths (3.4964) to get an internal factors score (-0.2631). The negative sign indicates that E-commerce trade weaknesses in the export of agricultural products outnumber opportunities.

There exist four types of strategies, aggressive, conservative, defensive and competitive. The Strategic Position And Action Evaluation (SPACE) matrix was used to determine what type of strategy a business should undertake. However, SPACE matrix analysis functions upon two internal and two external strategic dimensions (Figure 1). Horizontal axis indicates the algebraic sum of



**Figure 1.** Space of internal and external evaluation factors matrix, in E-Commerce export of agricultural commodities in Iran.

IFE items while the vertical axis indicates algebraic sum of EFE items. Since the internal factors score is negative and the external factor score is positive, the WO strategies are achieved.

SWOT is the first step of planning and it helps planners focus on key subjects. The SWOT method is a key tool used by businesses to formulate strategic plans. The SWOT matrix comprises four strategic groups consisting of SO (using Opportunities based on the Strengths of the business), WO (proper exploitation of environmental Opportunities due to the Weaknesses of the business), ST (using the business's Strengths to reduce or eliminate the effects of environmental Threats), and WT (alleviating the effects of environment Threats by taking the Weaknesses of organization into account). According to the results of IFE factors and EFE factors, weaknesses and opportunities are achieved, respectively. Based on the SPACE matrix (Table 5), conservative strategy is suggested for developing E-commerce in the field of exported agricultural commodities in Iran.

## CONCLUSION

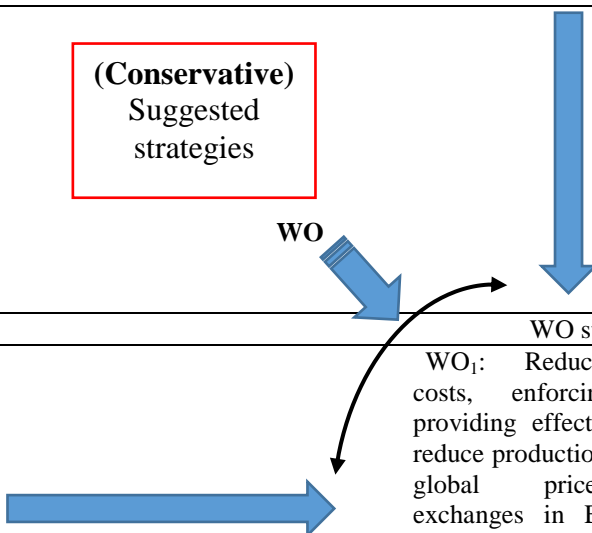
The analysis of SWOT is a framework for helping planners and managers identify strategies to realize their goals. This technique is used to analyze the strengths, weaknesses, opportunities, and threats of businesses. E-commerce has played an important role in exporting products, especially agricultural commodities. Identified strategies based on the analysis of SWOT have a vital role in enhancing the export of agricultural commodities. Important strategies that must be considered are including of reducing operational costs, enforcing laws, providing effective incentives to reduce production costs relative to global prices, accelerating exchanges in E-commerce, and making exchange transactions easier to save on the delivery of agricultural products. Moreover, creating innovation in

the export process using E-commerce and using new technologies in exports to strengthen standards in agricultural production. In addition, establishing companies in support of E-commerce services, increasing financial opportunities, interacting with regional and international E-commerce centers to increase the security of banking interactions, and improving the banking system for the exportation of agricultural products. Also, using modern export technologies, direct consumer communication and high demand in global and regional markets for agricultural products to strengthen the competitive position of Iran and its marketing operations in agricultural product exports. In addition, considering market preferences in agricultural production such as diverse needs of global consumers and the climate of Iran using electronic management, E-CRM customer communication, and alignment changing buyer trends. Moreover, establishing an effective management system for planning and coordinating the agencies responsible for agricultural exports using the well-trained agricultural labor force in agricultural product exports to create a positive attitude towards E-commerce in the Ministry of Jihad-e-Agriculture as well as interacting with regional and international E-commerce centers to exchange information and services and finally, strengthening and implementing supportive policies for the export of agricultural commodities along with the government's decision to expand non-oil exports to attract foreign investment in E-commerce to reduce local competition.

Base on the analysis of SWOT results, it is recommended that E-commerce organizations prioritize barriers and backwardnesses of E-commerce in order to maintain their position and eliminate internal weaknesses. Therefore, it is necessary to design program to achieve these goals and take advantage of the opportunities ahead constantly. For example,

**Table5.** SWOT matrix in E-commerce export of agricultural commodities in Iran.

Internal factors	
Strengths(S)	Weaknesses(W)
<p>S<sub>1</sub>: A way for buying faster and easier</p> <p>S<sub>2</sub>: Access to appropriate distribution networks for agricultural products</p> <p>S<sub>3</sub>: Application of coding system for agricultural commodities</p> <p>S<sub>4</sub>: Climatic variation in agricultural production</p> <p>S<sub>13</sub>: No need for the physical launch of agricultural exporters</p> <p>S<sub>14</sub>: The absence of commercial boundaries in the electronic trading of agricultural products</p>	<p>w<sub>1</sub>: Constraints on the testing of the physical quality of agricultural products</p> <p>w<sub>2</sub>: Disregarding market preference in the production of agricultural products</p> <p>w<sub>23</sub>: Weakness in the implementation of supportive policies in exporting agricultural products</p> <p>w<sub>24</sub>: Weakness of marketing operations in exporting agricultural products</p>
External factors	
Threats (T)	
<p>T<sub>1</sub>: Changes in the environment, law and regulations</p> <p>T<sub>2</sub>: Creating new business rivals</p> <p>T<sub>39</sub>: Not using modern technologies to accelerate international trade</p> <p>T<sub>40</sub>: Weak marketing infrastructure</p> <p>T<sub>41</sub>: Worrying about collapse of privacy</p>	<p><b>(Conservative) Suggested strategies</b></p>
Opportunities (O)	
<p>O<sub>1</sub>: Coordinating with the changing trend of buyers</p> <p>O<sub>2</sub>: Customer satisfaction</p> <p>O<sub>3</sub>: E-commerce Flexibility</p> <p>O<sub>4</sub>: Extending global interactions</p> <p>O<sub>5</sub>: improving Productivity</p> <p>O<sub>6</sub>: Increasing financial opportunities</p> <p>O<sub>36</sub>: Speeding up the swap</p> <p>O<sub>37</sub>: Increased exports, employment and production</p> <p>O<sub>38</sub>: No limited time (Availability all the time)</p> <p>O<sub>39</sub>: Reduce local competition</p>	<p><b>WO strategies</b></p> <p>WO<sub>1</sub>: Reducing operational costs, enforcing laws, and providing effective incentives to reduce production costs relative to global prices, accelerate exchanges in E-commerce, and make exchange transactions easier to save on deliveries of agricultural products</p> <p>WO<sub>2</sub>: Creating innovation in the export process using E-commerce and using new technologies in exports to strengthen the standards in agricultural production</p> <p>WO<sub>7</sub>: Strengthening and implementing supportive policies for the export of agricultural commodities along with the government's determination to expand non-oil exports in an effort to attract foreign investments in E-commerce to reduce local competition</p>



business entities in the country must prepare a well-designed and well-planned planning process for the sale of "exported products in line with global standards" in order to maintain and improve the competitiveness of agricultural exporters at the global level. Also, it is necessary to pay attention to the packaging of agricultural products in accordance with customers' tastes in global markets.

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### REFERENCES

- Alarcón, S. and Sánchez, M. 2016. Is There a Virtuous Circle Relationship Between Innovation Activities and Exports? A Comparison of Food and Agricultural Firms. *Food Policy*, **61(C)**: 70-79.
- Albastroiu, I. 2007. Contribution of the e-commerce to the economic development. *Rev. of Manag. and Eco. Engin.*, **6**: 3-8.
- Alizadeh, A., Saghebi, S., Habibisenobari, T. and Mohammadzaheri, M. 2018. Effects of Adoption and Satis faction on Word of Mouth in the Internet Banking of IRAN. *Int. Bank. Commerce*, **23(2)**: 1-30.
- Almousa, M. 2013. Barriers to E-Commerce Adoption: Consumers' Perspectives from a Developing Country. *iBusin.*, **5(1)**: 62-71.
- Amiri, Y. and Salarzahi, H. 2010. Fuzzy Sketch for Implementation of E-Business Plan in Iran SMEs. *Int. Bus. Res.*, **3(4)**: 172-180.
- Amirteimoori, S. and Chizari, A. H. 2008. An Investigation of Comparative Advantage of Pistachio Production and Exports in Iran. *J. Agri. Sci. Tech.*, **10**: 395-403.
- Amoozad Khalili, H. and Maleki, A. 2011. Project Risk Management Techniques in Resource Allocation, Scheduling and Planning. *Int. Schol. Sci. Res. Innov.*, **5(11)**: 2113-2117.
- Anvieh Takieh, L. 2002. Investigation of Production, Marketing and Trade System of Apple in Iran: A Case of Western Azerbaijan Province. PhD. Thesis in Agricultural Economics, Tarbiat Modares University, Tehran, Iran.
- Awais, M. and Samin, T. 2012. Advanced SWOT Analysis of E-Commerce. *Int. J. Comp. Sci. Issues*, **9(2)**: 569-574.
- Bao, L. and Huang, Y. 2012. On the Supply Chain Management Supported by E-Commerce Service Platform for Agreement based Circulation of Fruits and Vegetables. *Phys. Proce.*, **33**: 1957-1963.
- Barkhordari, M., Nourollah, Z., Mashayekhi, H., Mashayekhi, Y. and Ahangar, M. S. 2017. Factors Influencing Adoption of E-Payment Systems: An Empirical Study on Iranian Customers. *Inf. Sys. e-Bus. Manage.*, **15(1)**: 89-116.
- Bhattacharjee, A. 2002. Individual Trust on Online Firms: Scale Development and Initial Test. *J. Manage. Inf. Sys.*, **19(1)**: 211-241.
- Cai, Y., Lang, Y., Zheng, S. and Zhang, Y. 2015. Research on the Influence of E-commerce Platform to Agricultural Logistics: An Empirical Analysis based on Agricultural Product Marketing. *Int. J. of Sec. and Its Appl.*, **9(10)**: 287-296.
- Canavari, M., Fritz, M., Hofstede, G. J., Matopoulos, A. and Vlachopoulou, M. 2010. The Role of Trust in the Transition from Traditional to Electronic B2B Relationships in Agri-Food Chains. *Comp. Elec. Agri.*, **70(2)**: 321-327.
- Chang, Y. 2002. *Dynamics of Banking Technology Adoption: An application to Internet Banking*. Working Paper University of Warwick.
- Chen, Q. and Zhang, N. 2015. Does E-Commerce Provide a Sustained Competitive Advantage? An Investigation of Survival and Sustainability in Growth-Oriented *Enterprises Sustain.*, **7**: 1411-1428.
- Cosgun, V. and Dogerlioglu, O. 2012. Critical Success Factors Affecting e-commerce Activities of Small and Medium Enterprises. *Inf. Tech. J.*, **11**: 1664-1676.
- Datta, P. 2012. A Preliminary Study of Ecommerce Adoption in Developing Countries. *Inf. Sys. J.*, **21**: 3-32.
- David, M. E., David, F. R. and David, F. R. 2009. The Quantitative Strategic Planning Matrix (QSPM) Applied to a Retail Computer Store. *Coastal Bus. J.*, **8(1)**: 42-52.
- DeYoung, R., Lang, W. and Nolle, D. 2007. How the Internet Affects Output and Performance at Community Banks. *J. Bank. Fin.*, **31(4)**: 1033-1060.



21. Dhanashri Patil, M. 2014. E-Commerce-SWOT Analysis. *I. J. Manage. Commerce Innov.*, **2(1)**: 226-231.
22. Fels, A., Falk, B. and Schmitt, R. 2017. User-driven Customization and Customer Loyalty: A Survey. *Proc. CIRP*, **60**: 410-415.
23. Frederiksen, M. 2014. Trust in the Face of Uncertainty: A Qualitative Study of Intersubjective Trust and Risk. *Int. Rev. Soc.*, **24(1)**: 130-144.
24. Gefen, D. and Straub, D. 2003. Managing User Trust in B2C E-Services. *e-Serv. J.*, **2(2)**: 7-24.
25. Ghorbani, M. R. 2008. The Efficiency of Saffron's Marketing Channel in Iran. *World Appl. Sci. J.*, **4(4)**: 523-527.
26. Gretzky, W. 2010. *Strategic planning and SWOT analysis. Essentials of Strategic Planning in Healthcare, Chapter 5*. Health Administration Press.
27. Helander, M. G. 2000. Modeling the Customer in Electronic Commerce. *Appl. Ergon.*, **31(6)**: 609-619.
28. Hetampur, B. 2011. E-Commerce and Business Society. *Global J. Bus. Manage. Inf. Tech.*, **1**: 43-47.
29. Hosseini, F., Chizari, M. and Manian, A. 2012. Challenges and Solutions for Implementing E-Commerce in Saffron Export as Viewed by Agricultural Ministry Experts. *Indian Res. J. Ext. Edu.*, **1**: 93-99.
30. Hosseini, M., Hemati-Kakhki, A. and Karbasi, A. R. 2003. Study of Social and Economical Effects of Ten Years Research on Saffron. *3rd Nation. Symp. on Saffron*, Mashhad, Iran.
31. Huo, Y. and Mu, H. 2017. Research on the Development of E-commerce Model of Agricultural Products. *MATEC Web of Conferences*, **100**: 02040.
32. Jeethesh Dsouza, D. and Joshi, H. G. 2014. Development of Agricultural E-commerce Framework for India, a Strategic Approach. *J. Eng. Res. Appl.*, **4(11)**: 135-138.
33. Kamalabadi, N., Bayat, A., Ahmadi, P. and Ebrahimi, A. 2008. Identifying and Prioritization of Challenges and Barriers of E-Commerce Implementation in Iran. *World Appl. Sci. J.*, **5**: 590-597.
34. Kazemiyeh, F., Sadighi, H. and Chizari, M. 2016. Investigation of Rural Tourism in East Azarbaijan Province of Iran Utilizing SWOT Model and Delphi Technique. *J. Agr. Sci. Tech.*, **18**: 1-12.
35. Kiang, M. Y. and Chi, R. T. 2001. A Framework for Analyzing the Potential Benefits of Internet Marketing. *J. Elec. Commerce Res.*, **2(4)**: 157-163.
36. Kiran, Y. and Sharma, D. 2014. SWOT Analysis of E-Commerce. *Adv. Elec. Electric Eng.*, **4(6)**: 663-668.
37. Kshetri, N. 2007. Barriers to E-Commerce and Competitive Business Models in Developing Countries: A Case Study. *Elec. Commerce Res. Appl.*, **6(4)**: 443-452.
38. Lawrence, J. E. and Tar, U. A. 2010. Barriers to Ecommerce in Developing Countries. *Inf. Soc. Justice*, **3(1)**: 23-35.
39. Lee, S. J., Ahn, C., Song, K. M. and Ahn, H. 2018. Trust and Distrust in E-Commerce. *Sustain.*, **10**: 1-19.
40. Liu, H., Wang, Y. and Xie, K. 2013. Agricultural E-Commerce Sites Evaluation Research. *Int. J. Bus. Soc. Sci.*, **4(17)**: 138-143.
41. Mazhar, F., Jam, F. and Anwar, F. 2012. Consumer trust in e-commerce: A study of consumer perceptions in Pakistan. *African J. of Busin. Manag.*, **6(7)**: 2516-2528.
42. Mohammadi, R., Lashgarara, F., Omidi Najafabadi, O. and Dinpanah, R. 2018. Designing Model of Using Information and Communication Technologies in Rural Marketing Mix of Garmsar County, Iran. *J. Agr. Sci. Tech.*, **20**: 435-443.
43. Mols, N. P. 2000. The Internet and Services Marketing: The Case of Danish Retail Banking. *Inter. Res.: Elec. Network. Appl. Policy*, **10(1)**: 7-18.
44. Nouri, J., Karbassi, A. R. and Mirkia, S. 2008. Environmental Management of Coastal Regions in the Caspian Sea. *Int. J. Environ. Sci. Tech.*, **5(1)**: 43-2.
45. Oluwaseun, I. 2013. *E-Commerce in Developing Nations: Issues and Challenges. Consumer Attitude In the Nigerian Market*. M.s., University of Arcada.
46. Overby, E. and Jap, S. 2009. Electronic and Physical Market Channels: A Multiyear Investigation in a Market for Products of Uncertain Quality. *Manage. Sci.*, **55(6)**.
47. Patton, M. A. and Jøsang, A. 2015. *Technologies for Trust in Electronic Commerce*. Kluwer Academic Publishers, The Netherlands.
48. Rillo, A. D. and Dela Cruz, V. 2016. *The Development Dimension of E-Commerce in Asia: Opportunities and Challenges*. Asian Development Bank Institute.
49. Riston, N. 2008. *Strategic Management*. Publisher: APS.

50. Robert, C. and MacGregor, L. V. 2005. A Basic Model of Electronic Commerce Adoption Barriers. *J. Small Bus. Enterprise Dev.*, **12(4)**: 510-527.
51. Sabha, S. 2017. SWOT Analysis of Business or Electronic Commerce (E-Commerce). *Int. J. Edu. Res.*, **5(5)**: 105-112.
52. Salehi, M. and Alipour, M. 2010. E-Banking in Emerging Economy: Empirical Evidence of Iran. *Int. J. Eco. Fin.*, **2(1)**: 201-209.
53. Sammut-Bonnici, T. and Galea, D. 2015. *SWOT Analysis*. John Wiley & Sons, Ltd.
54. Sarlak, M. A., Aliahmadi, A. R., Ghorbani, A. and Shahidi, M. 2009. Recognition of Factors Affecting the Successful Implementation of Electronic Banking in Iran. *J. Appl. Sci.*, **9(21)**: 3821-3828.
55. Sherafati, M., Bidabad, B. and Mohammadi, R. 2014. Barriers to E-Commerce in SMEs of Iran. *J. Appl. Sci. Agri.*, **9(6)**: 2591-2599.
56. Sheshunoff, A. 2000. Internet Banking: An Update from the Frontlines. *ABA Bank. J. Am. Bankers Assoc.*, **92(1)**: 51-53.
57. Taheri, A. 2012. *The Adoption of the E-Commerce Thesis for the Master's Degree in Business Administration*. Blekinge Institute of Technology.
58. Totonchi, J. and Kakamanshadi, G. H. 2011. Globalization and E-Commerce. *2nd International Conference on Networking and Information Technology*, Singapore. 270-276.
59. United States 2008. *SWOT Analysis : A Tool for Making Better Business Decisions*. [Washington, D.C.], U.S. Dept. of Agriculture, Risk Management Agency.
60. Uzoka, E. F. M., Shemi, A. P. and Seleka, G. G. 2007. Behavioral Influences on E-Commerce Adoption in a Developing Country Context. *Elec. J. Inf. Sys. Dev. Countries*, **31(4)**: 1-15.
61. Velmurugan, S. M. 2009. Security and Trust in E-Business: Problems and Prospects. *Int. J. Elec. Bus. Manage.*, **7(3)**: 151-158.
62. Vos, A., Marinagi, C., Trivellas, P., Eberhagen, N., Skourlas, C. and Giannakopoulos, G. 2014. Risk Reduction Strategies in Online Shopping: E-Trust Perspective. *Procedia. - Soc. Behav. Sci.*, **147**: 417-423.
63. Wandoko, W., Abbas, B. S., Budiastuti, D. and Kosala, R. 2017. Online Trust Building through Third Party Trust Transfer and Third Party Protection. *J. Phys.: Confe. Series*, **801(1)**: 1-8.
64. Wen, M. 2007. A Knowledge-Based Intelligent Electronic Commerce System for Selling Agricultural Products. *Comp. Elec. Agri.*, **57(1)**: 33-46.
65. Zhu, K., Kraemer, K. and XU, S. 2002. A Cross-Country Study of Electronic Business Adoption Using the Technology-Organization-Environment Framework. *Proceedings of the 23rd International Conference on Information Systems*. 337-348.
66. Zhu, M. Q. and Zou, Z. X. 2014. Research on Middle and Small Manufacture Enterprise E-Commerce Application Systems. *Adv. Mater. Res.*, **933**: 819-823.
67. Zulkarnain, A., Wahyuningtias, D. and Putranto, T. S. 2017. Analysis of IFE, EFE and QSPM Matrix on Business Development Strategy. *Proceeding of The 4th Friendly City Conference*, 2017 Medan, Indonesia.



## تجزیه و تحلیل نقاط قوت، ضعف، فرصت و تهدید در تجارت الکترونیک برای صادرات محصولات کشاورزی در ایران

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### چکیده

تجارت الکترونیک (E-commerce) یک مفهوم معاصر با پتانسیل عظیمی است که اساسا تغییر در نحوه انجام کسب و کار را نشان می دهد. این مقاله، استراتژی های تجارت الکترونیک را برای تجارت کالاها و خدمات کشاورزی توصیف می کند. هدف از این مطالعه افزایش بهره وری تجارت الکترونیک در صادرات کالاهای کشاورزی است. از آنجا که روش SWOT یک ابزار کلیدی است که توسط شرکت ها برای برنامه ریزی برنامه های استراتژیک استفاده می شود. برای انتخاب جمعیت آماری از روش نمونه گیری تصادفی استفاده شده است. جامعه آماری شامل ۹۶ کارشناس از وزارت کشاورزی بوده است. هفتاد و پنج پرسشنامه در بین کارشناسان (۷۵ نفر) با استفاده از جدول مورگان و کرجسی توزیع گردید که از این میان ۵۹ پرسشنامه جمع آوری گردیده است (۵۹ نفر). پرسشنامه شامل نقاط قوت، نقاط ضعف، فرصت ها و تهدیدهای توسعه تجارت الکترونیک با استفاده از تکنیک دلفی تهیه شده است. نتایج مهم استفاده از تجزیه و تحلیل SWOT، چارچوبی برای کمک به برنامه ریزان و مدیران در دستیابی به اهداف و افزایش صادرات کالاهای کشاورزی می باشد. تجزیه و تحلیل ماتریس نتیجه SWOT در منطقه WO (استراتژی محافظه کارانه) قرار دارد. بر این اساس توصیه می شود که برای بهره برداری مناسب از فرصت های محیطی، ضعف های سازمان در نظر گرفته شود. همچنین این مقاله شامل برخی از استراتژی های پیشنهاد شده دیگر نیز می باشد. برخی از استراتژی های پیشنهاد شده مهم، اجرای قوانین و ارائه انگیزه های موثر برای کاهش هزینه های تولید در مقایسه با قیمت های جهانی و همچنین ایجاد نوآوری در فرایند صادرات با استفاده از تجارت الکترونیک است.