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RESEARCH ARTICLE

The impact of E-Commerce on the availability of marketing information for agricultural export companies

Samar B. Sh. Hassan, M.M.M. Hamdoon and Zahraa B. M. Abdelkawy*

Department of Agricultural Economics & Extension, Faculty of Agriculture, South Valley University, 83523 Qena, Egypt

Abstract

This study aims to examine the impact of e-commerce on the availability of marketing information for agricultural export companies. The research relied on both primary and secondary data sources. Secondary data sources included statistical publications and previous studies, while primary data were collected through an online questionnaire distributed to 250 agricultural export companies. The research reached several important findings regarding the impact of e-commerce on agricultural exports. The data revealed several obstacles limiting agricultural companies' benefits from e-commerce, the most significant of which is fraud, which accounts for 79% of the sample studied. The study also found that a large percentage of farmers and small producers (78%) lack sufficient skills in using modern technological tools, which hinders their progress in this field. On the other hand, the study showed that traditional communication methods, such as email and fax, still play an important role in agricultural crop export processes, with an 88% usage rate. In light of these findings, the research recommends strengthening legal regulations in Egypt to ensure the security of e-commerce transactions in the agricultural export sector, as well as enhancing the role of cooperative associations and developing their ability to provide necessary marketing information to farmers and exporters.

Keywords: E-commerce; marketing information; agricultural exports

1. Introduction

Investing in e-commerce and developing digital infrastructure are pivotal factors that could bring about a significant transformation in enhancing agricultural exports by improving efficiency and increasing competitiveness both locally and internationally. Amidst the information revolution and rapid digital transformation, technology has become an essential component in all aspects of daily life and the global economy. The shift towards a digital economy has opened vast opportunities for creating more flexible and efficient business models, where e-

commerce and digital marketing have become key tools for enabling companies to access new markets and enhance effective communication with customers and consumers worldwide. Thanks to these modern technologies, many marketing functions, such as product promotion, customer interaction, and conducting business transactions, have been simplified, leading to increased sales, reduced costs, and accelerated business processes.

The problem of the study lies in the fact that many global marketing companies rely heavily on e-commerce, while in Egypt, despite the noticeable increase in the use of e-commerce, it remains in a very modest stage. In 2023, Egypt's e-commerce volume was only approximately \$6.6 billion. The Egyptian agricultural market faces several marketing challenges, the most

*Corresponding author: Zahraa B. M. Abdelkawy Email: z.mohamed@agr.svu.edu.eg

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prominent of which is the lack of marketing information needed by farmers, producers, and exporters alike. There is also a weakness in understanding the needs of both local and international markets, which significantly impacts supply and demand mechanisms, leading to sharp fluctuations in agricultural crop prices.

Problem of the Study

The problem of the study lies in the significant disparity between global and local trends in ecommerce. While many global marketing are increasingly adopting companies commerce, with the global e-commerce volume reaching approximately \$5.541 trillion in 2022, e-commerce in Egypt remains very modest in comparison, recording only \$6.6 billion in 2023. As for the Egyptian agricultural sector, it faces numerous marketing challenges that affect the effectiveness of agricultural companies. The most prominent of these challenges is the lack of accurate marketing information needed by farmers, producers, and exporters Additionally, the sector struggles with understanding the needs of both local and international markets, which negatively impacts the ability of agricultural companies to expand and compete in global markets.

Research Objective

This study aims to analyze the strategic role of e-commerce in enhancing agricultural exports by examining its impact on improving the effectiveness and efficiency of marketing operations in the agricultural sector. The research also seeks to evaluate the role of marketing information provided by e-commerce in enhancing the transparency of agricultural markets, which contributes to improving competition levels and increasing competitiveness of agricultural companies both locally and internationally. Additionally, the study aims to identify the key technological tools that agricultural exporters rely on to improve their business performance, as well as explore the factors and challenges that may hinder the application of these technological tools in agricultural markets and the impact of these challenges on the economic growth of the sector.

2. Research Methodology and Data Sources

This study adopted a functional, analytical, and quantitative approach, utilizing advanced statistical methods to analyze the data and derive conclusions. Regarding data collection, the research relied on both primary and secondary sources. The secondary sources included books, scientific references, and previous studies that addressed the topic, in addition to official data published by recognized authorities such as the Central Agency for Public Mobilization and Statistics, the Food and Agriculture Organization (FAO), and the Ministry of Communications.

As for the primary sources, the study relied on carefully designed electronic questionnaires, which were distributed to employees and owners of agricultural export companies across various governorates of the country, with the aim of collecting field data that would enrich the research results.

The study population in this research was selected from agricultural export companies in the Arab Republic of Egypt, based on the data in Table (1). The total number of export companies was 576, distributed across various governorates of Egypt. These companies were classified into four categories based on their size: micro-sized companies), small-sized companies (413 companies (128 companies), medium-sized companies (30 companies), and large-sized companies (5 companies). This data was from the Export Development obtained website Authority

(www.expoegypt.gov.eg.2024). 1.1. Second: Research Sample

The sample size for the research was determined based on the total number of export companies.

The sample size was calculated using a computational tool available on the website http://www.rasoft.com/saplesize.html, which relies on Richard Geiger's formula. A confidence level of 95% was used to determine the sample size, resulting in a target of 231 companies. Data were collected through several methods, such as sending the questionnaire via

email, participating in company groups on social media platforms, and directly contacting companies via phone and WhatsApp. Additionally, personal interviews and visits to agricultural exhibitions were conducted. These methods collectively resulted in the collection of 250 response forms from the relevant companies.

Table 1. Number of Agricultural Export Companies in the Arab Republic of Egypt by Size

Company Size	Number of Companies
Micro-sized	413
Small-sized	128
Medium-sized	30
Large-sized	5
Total Companies	576

Source: www.expoegypt.gov.eg.2024

3. Results and discussion

3.1. Definition of E-Commerce

E-commerce is the process of using the internet and modern digital technologies to conduct buying and selling transactions, in addition to exchanging goods and services between individuals and companies. These activities include various processes such as selling physical and digital products, exchanging information, providing electronic payment services, and completing business transactions digitally. E-commerce has contributed to the development of economic systems by helping to reduce operational costs, expand market reach, and enhance competition among companies.

3.2. Definition of Marketing Information Systems

Marketing information systems are a set of tools and techniques, whether traditional or digital, aimed at collecting and analyzing data from both internal and external sources to support effective marketing decision-making. These systems assist in studying market needs, consumer behaviour, and competitive trends, which helps

in developing more precise and efficient marketing strategies. These systems also play a crucial role in improving marketing performance by providing accurate and up-to-date information that contributes to achieving organizational objectives and increasing return on investment.

3.3. Comparison Between E-Marketing and Traditional Marketing

In light of technological advancements, marketing has undergone a significant transformation from traditional methods to modern digital techniques. This shift has improved the efficiency of marketing operations, increased the ability to target customers accurately, and achieved wider reach at lower costs. The key differences between e-marketing and traditional marketing can be illustrated in the following Table (2):

3.4. Indicators of the Temporal Development of E-Commerce Volume in Egypt

The data presented in Table (3) illustrates the development of e-commerce volume in Egypt during the period from 2001 to 2023. It shows

significant growth that reflects the shift towards the digital economy and the increasing reliance on technology in buying and selling processes. The results can be categorized as follows:

Table 2. Comparison Between E-Marketing and Traditional Marketing

Criterion	E-Marketing	Traditional Marketing
Cost	Lower cost, as digital campaigns can run on a small budget and spending can be precisely controlled.	High cost due to printing, TV, and advertising in traditional media.
Targeting and Reach	Precise targeting using data, age groups, interests, geographic location, and user behavior.	Difficult to target accurately, often general and not aimed at specific groups.
Measurement and Analysis	Easy performance measurement using data analytics tools (Google Analytics, social media platforms).	Difficult to measure, relies on surveys or actual sales to determine campaign success.
Interactivity and Flexibility	Direct interaction with the audience through comments, messages, and real-time updates.	Limited interaction, based on indirect feedback like phone calls or store visits.
Reach and Time	Global reach in a very short time, campaigns can run 24/7.	Takes longer to reach the audience, often geographically limited.

Table 3. Temporal Development of E-Commerce Volume in Egypt from 2001 to 2023.

Years	E-Commerce Volume (in Billion USD)
2001	0.1
2002	0.2
2003	0.4
2004	0.6
2005	0.8
2006	1
2007	1.1
2008	1.2
2009	1.3
2010	1.5
2011	1.6
2012	1.7
2013	2
2014	2.1
2015	2.3
2016	2.5
2017	3.3
2018	3.6
2019	4.9
2020	9.8
2021	6.4
2022	10.4
2023	6.61
Average	2.8
Highest Value	10.4
Lowest Value	0.1

3.4.1. Continuous Growth

E-commerce in Egypt began with a value of \$0.1 billion in 2001, and it continued to grow gradually, reaching \$2.5 billion in 2016.

Between 2017 and 2019, it experienced accelerated growth, recording \$3.3 billion in 2017 and reaching \$4.9 billion in 2019.

3.4.2. Significant Jump Due to the Pandemic

In 2020, e-commerce volume doubled to \$9.8 billion, a result of the COVID-19 pandemic's impact. The increased demand for online shopping was driven by movement restrictions and partial closures of traditional markets.

3.4.3. Post-Pandemic Fluctuations

After the peak in 2020, e-commerce dropped to \$6.4 billion in 2021, before reaching its highest value ever at \$10.4 billion in 2022. However, in 2023, it decreased again to \$6.61 billion, reflecting economic changes and the adjustment to the post-pandemic phase.

These data reflect the rapid digital transformation in Egypt and the impact of technology on the e-commerce sector. The sector is expected to continue growing with the development of digital infrastructure and increased trust in electronic payment platforms.

However, the fluctuations in recent years indicate the need for supporting sustainable growth strategies to ensure the stability and expansion of e-commerce in the future.

3.5. Results of Statistical Analysis

The statistical analysis results in Table (3) indicate that the linear trend is the best statistical fit, showing a consistent and statistically significant upward direction. The annual increase amounted to approximately 0.36 billion USD, with an annual growth rate of about 12.85% of the average. Additionally, the coefficient of determination (R²) is approximately 0.69, meaning that 69% of the changes in the temporal development of ecommerce volume in Egypt can be attributed to the factors reflected by the time element.

Table 3. Equation of the General Trend for the Temporal Development of E-Commerce Volume in Egypt from 2001 to 2023.

Variable	α	β	Т	R ²	F	Average	Growth Rate (%)
E-Commerce (Billion USD)	-1.52	0.36	(6.71)**	0.69	45.10	2.8	12.85

Where: R²: Coefficient of Determination; F: Model Significance; T: T-statistic (**); indicates a 1% level of statistical significance.

Source: Collected and calculated from Table (2).

3.6. Temporal Development of Egyptian Agricultural Exports

Table (4) presents the temporal development of total agricultural exports from 2001 to 2023. The average export quantity during this period was 3,148 thousand tons, with the lowest export quantity recorded in 2002 at 1,252 thousand tons, while the highest value was achieved in 2019 at 5,350 thousand tons. Additionally, the average export value of agricultural crops during the same period was 2,175.83 million USD, with a standard deviation of 958.44 million USD. The lowest export value was recorded in 2001 at 530 million USD, and the highest value occurred in 2023, reaching 3,775 million USD.

3.7. The Impact of Time Factor on the Quantity and Value of Egyptian Agricultural Exports (2001-2023)

The results of the statistical analysis in Table (5) indicate that the linear model is the most statistically significant and follows a generally increasing trend, which is statistically significant. The annual increase in both the quantity and value of Egyptian agricultural exports was approximately 174.8 thousand tons and 125.70 million dollars, respectively, with an annual growth rate of about 5.55% and 5.77% of the average, respectively. The coefficient of determination, which was about 0.86 and 0.79,

respectively, indicates that 86% and 79% of the changes in the quantity and value of Egyptian

agricultural exports are attributed to factors reflected by the time variable.

Table 4. Temporal Development of Agricultural Exports from 2001 to 2023.

Year	Export Quantity (Thousand Tons)	Export Value (Thousand USD)
2001	1448	530
2002	1252	671
2003	1395	776
2004	1854	1105
2005	2241	918
2006	2242	855
2007	2111	1202
2008	1956	1881
2009	2374	2724
2010	2958	2885
2011	3298	2752
2012	2406	2445
2013	4618	2634
2014	3043	2762
2015	3463	2703
2016	3343	2585
2017	4119	2562
2018	4191	2503
2019	5350	2659
2020	4333	2710
2021	5003	2962
2022	4255	3445
2023	5151	3775
Average	3148	2175.8
Maximum	5350	3775
Minimum	1252	530

Source: Central Agency for Public Mobilization and Statistics (CAPMAS) – Foreign Trade Database and Foreign Trade and Export Movement Report for Major Agricultural Goods Exports, Various Issues. Ministry of Agriculture and Land Reclamation, July 2023.

Table 5. The Impact of the Time Factor on the Quantity and Value of Egyptian Agricultural Exports (2001-2023)

Variable	α	β	T	\mathbb{R}^2	F	Average	Rate of Change (%)
Export Quantity (Thousand Tons)	1050.7	174.8	(11.46)**	0.86	131.4	3148	5.55
Export Value (Million Dollars)	667.37	125.70	(8.92)**	0.79	79.6	2175.8	5.77

Where: R²: Coefficient of determination; **F**: Significance of the overall model; (): Statistical significance level at 1%

Source: Collected and calculated from Table (4).

3.8. E-Commerce Methods

As previously mentioned, one of the most prominent features of e-commerce is its reliance on the internet. There are various methods that connect customers and companies in this field. These methods vary according to the information shown in Table (6), which outlines the main ways used in e-commerce by exporting companies in the research sample. These methods include:

- 1. Social Media: Social media platforms are considered one of the simplest and most important methods used for marketing and promoting products due to the large number of potential customers on these platforms. The social media platforms used include Facebook, WhatsApp, and others. Data from Table (6) indicate that 85% of the exporting companies in the research sample rely on social media to market their products.
- **2.** Company Website: As shown in Table (6), exporting companies use their websites as a

- primary tool for marketing and communicating with customers. The rate of website usage is 75% in the research sample.
- **3. Mobile Applications** (e.g., Hadhod and Mahsoli apps): The Ministry of Agriculture has launched dedicated mobile applications to support farmers and producers, such as the Hadhod and Mahsoli apps, which allow users to market crops and check prices. Data from Table (6) show that 52% of the exporting companies in the research sample use these apps as a marketing tool.
- **4. Email and Fax:** Email and fax are among the prominent communication methods used in ecommerce. According to data from Table (6), 88% of the exporting companies in the research sample rely on these means to communicate with their customers.

Table 6. E-Commerce Methods Used in Marketing and Exporting Agricultural Crops

E-Commerce Methods	Percentage of Respondents Using Them
Social Media (Company's official page, Facebook, WhatsApp)	85%
Company's Official Website	75%
Mobile Applications (e.g., Hadhod, Mahsoly apps)	52%
Email and Fax	88%

3.9. Reasons for Using E-Commerce

The data in Table (7) indicate that e-commerce plays a crucial role in improving the commercial performance of export companies. The increasing relative importance of the advantages offered by e-commerce, such as increasing the number of importers and clients (88%), improving marketing compared to traditional methods (86%), reflects a shift towards the use

of these tools to expand markets and enhance efficiency.

Furthermore, the high percentage (90%) that highlights the importance of facilitating access to global markets underscores the vital role of ecommerce in enabling companies to expand and grow in international markets. This reflects ecommerce's ability to overcome geographical and temporal barriers, offering opportunities to access new markets with ease.

Table 7. Reasons for Using E-Commerce

Reasons for Using E-Commerce	Relative Importance
Increasing the number of importers and clients	88%
Better than traditional marketing methods	86%
Easy access to global markets	90%
Easy collection of marketing information	87%

Reasons for Using E-Commerce	Relative Importance
Constant communication with customers	89%
Does not require an intermediary	88%

Source: Collected and calculated from the research survey, 2024.

The data regarding the collection of marketing information (87%) indicates that companies recognize the importance of e-commerce in providing accurate and comprehensive market data. This helps in making business decisions based on analysis supported by up-to-date and live information.

Additionally, the constant communication with customers, reflected in the 89% rate, is one of the main factors driving companies to use e-commerce. This communication helps enhance relationships with customers and provides faster and more efficient services.

Finally, the ability of e-commerce to eliminate intermediaries, leading to a 88% reduction in costs, is one of its major advantages. This feature makes it an attractive option for export companies seeking to cut costs and maximize resource utilization.

These results show that e-commerce is a powerful tool for driving growth and expansion for export companies, offering multiple advantages, including improving market access, reducing costs, enhancing efficiency in information collection, and managing customer relationships effectively.

Despite the significant importance of ecommerce in marketing and exporting, there are several barriers that hinder its widespread use. According to the data presented in Table (8), the main barriers identified are as follows:

1. Difficulty in using e-commerce: This difficulty relates to handling electronic devices

and the methods of digital marketing. The relative importance of this barrier was 57% of the total sample in the study.

- **2. Exposure to fraud and scams by users**: One of the major barriers faced by export companies in adopting e-commerce is the risk of cyber theft and fraud. The importance of this barrier was found to be 79%, highlighting its significant impact.
- **3.** Lack of qualified and trained human resources: The absence of skilled and trained personnel within companies is a significant barrier to adopting modern technology. The relative importance of this barrier was 66%, indicating its considerable effect on e-commerce adoption.
- **4. High costs of digital marketing**: Although emarketing is generally cheaper than traditional marketing, there are instances where it requires higher investments, especially in areas that require advanced tools and techniques. The relative importance of this barrier was 52%, according to the study sample.
- **5.** Lack of awareness about e-commerce among producers and farmers: Many producers and farmers face challenges in understanding and utilizing e-commerce, which hampers cooperation between export companies and farmers in marketing agricultural products electronically. The relative importance of this barrier was 78% for the sample.

Table 8. Barriers to the Use of E-Commerce

Main Barriers to E-Commerce Use	Relative Importance
Difficulty in using e-commerce	57%
Exposure to fraud and scams by users	79%
Lack of qualified and trained human resources in the company	66%
High costs of digital marketing	52%

Main Barriers to E-Commerce Use	Relative Importance
Lack of knowledge about e-commerce among producers and farmers	78%
Poor internet network in the country	62%

Source: Collected and calculated from the survey form, 2024.

6. Weak Internet Network: The telecommunications and internet infrastructure are among the fundamental factors that support the use of e-commerce. When this network is weak, the use of e-commerce is significantly affected. The relative importance of this obstacle reached 62% in the research sample.

These obstacles highlight the various challenges companies face in utilizing e-commerce and emphasize the need to improve technical infrastructure, train individuals, and raise awareness of e-commerce technologies among producers and farmers.

3.10. Key Marketing Information Needed by Companies

Marketing information is a fundamental factor contributing to the success of companies and their ability to remain competitive in the markets. This information also helps companies quickly adapt to changes in the market. According to the data in Table (9), the most important marketing information needed by export companies in the research sample is as follows:

- 1. Knowing Prices in Domestic and International Markets: Understanding prices in local and international markets is essential information for companies. The relative importance of this information reached 95% in the research sample.
- 2. Knowing the Quantities Required for Export: Export companies need to know the required quantities of crops to meet market demands. The relative importance of this information was 94%.

Table 9. Key Marketing Information Needed by Companies

Key Marketing Information Needed by Companies	Relative Importance
Knowing prices in domestic and international markets	95%
Quantities required for export	94%
Agricultural practices performed on crops	93%
Information about competing markets	94%
Technical specifications required abroad	95%
Agricultural quarantine and export requirements	93%

Source: Collected and calculated from research survey data, 2024.

3. Agricultural Practices Performed on Crops:

This information includes methods of sorting, grading, storage, and shipping. A lack of such information can lead to increased crop losses and, consequently, financial losses for companies and producers. The relative importance of this information was 93%, according to the research sample.

4. Information About Competing Markets: Understanding competing markets is a critical

factor that helps export companies enter new markets or increase their market share in existing ones. This information enhances companies' competitiveness by identifying market characteristics and analyzing competing exporters. The relative importance of this information was 94%.

5. Technical Specifications Required Abroad: Technical specifications for crops vary across markets, such as permissible pesticide levels. This information is crucial for export companies

to ensure their products meet external requirements. The relative importance of this information was 95%.

6. Agricultural Quarantine and Export Requirements:

Knowledge of agricultural quarantine regulations and export requirements is essential for companies to comply with international laws and regulations. The relative importance of this information was 93% in the research sample.

It is evident that export companies rely heavily on marketing information related to prices, demand for quantities, technical specifications, agricultural practices, knowledge of competing markets, and export requirements. This comprehensive reliance ensures the success of their export operations.

3.11. Development of E-Commerce Use in Exporting Agricultural Crops

The results of Table (10), derived from the research sample, highlight the key benefits **Table 10.** Development of E-Commerce use.

export companies have achieved through the use of e-commerce. These benefits have contributed to increased agricultural export profits and the growth of export companies. The findings can be summarized as follows:

1. Access to New Markets: E-commerce has enabled export companies to reach new markets and increase their visibility among importers. The relative importance of this result was 87% in the research sample.

2. Acquisition of Essential Marketing Information:

E-commerce has helped companies obtain critical marketing information, enhancing their ability to make informed business decisions. The relative importance of this benefit was 87%.

3. Increase in Export Quantities: The use of e-commerce has contributed to an increase in exported quantities, with the positive impact of this result reaching 87%, according to the research sample data.

Key Results of E-Commerce Use	Relative Importance
Access to new markets	87%
Acquisition of marketing information needed by companies	87%
Increase in export quantities	87%
Improvement in the quality of export crops	82%
Knowledge of export requirements and conditions	87%
Understanding the preferences of foreign customers and importers	89%

4. Improvement in the Quality of Export Crops:

E-commerce has contributed to improving the quality of exported agricultural crops. The relative importance of quality improvement was 82%.

5. Knowledge of Export Requirements and Conditions:

E-commerce has been an important source of information on export requirements and conditions, helping companies comply with

international standards. The relative importance of this result was 87%.

6. Understanding the Preferences of Foreign Customers and Importers:

One of the key advantages of e-commerce is its ability to facilitate the understanding of customer preferences in foreign markets, which helps improve marketing strategies. The relative importance of this aspect was 89%.

Based on these results, it is clear that ecommerce has had a significant positive impact on export companies. It has expanded their markets, improved the quality of their crops, and increased their competitiveness by providing valuable marketing information and fostering better communication with customers and importers in global markets.

4. Recommendations

- 1. Enhance the Use of E-Commerce: E-commerce should be utilized as a key tool for expanding markets and increasing competitiveness. This can be achieved by expanding the use of social media platforms and websites to improve communication with customers and importers on a global scale.
- **2. Focus on Human Resource Training**: Provide specialized training programs for employees in export companies to enhance their skills in e-marketing and data analysis.
- 3. Improve Technical Infrastructure: Since weak internet networks pose a major obstacle, it is recommended to strengthen the internet infrastructure in Egypt, providing fast and reliable internet access to all export companies. This will facilitate business operations and enhance the effectiveness of ecommerce use.
- **4. Build Trust in E-Transactions:** Due to concerns about fraud and scams online, companies should strengthen security measures for electronic transactions. This can be achieved by using secure payment systems and educating companies and consumers on how to handle

5. Encourage Public-Private Sector Collaboration:

online risks.

Enhance the e-commerce environment by offering financial incentives or facilitating access to funding for innovative e-business projects.

6. Expand the Use of Agricultural Applications:

Make better use of specialized agricultural applications such as "Haddad" and "Mahsouli," which allow farmers and export companies to communicate easily with customers and importers. By increasing awareness of these applications, crop quality and productivity can be improved.

7. Develop Specialized E-Commerce Platforms for Agricultural Products: Focus on developing platforms that specifically cater to agricultural products to streamline the export process.

8. Align with International Export Requirements:

Ensure compliance with international standards and export requirements to boost the competitiveness of agricultural exports in global markets.

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Not applicable

Consent for Publication

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Conflicts of Interest

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