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DIGITAL TRANSFORMATION IN AGRICULTURAL MARKETING: ATTITUDES AND CHALLENGES AMONG EGYPTIAN HONEY AND OLIVE OIL PRODUCERS – AN EMPIRICAL STUDY

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ABSTRACT

This study examines how Egyptian Arab Republic honey and olive oil producers understand e-marketing with a specific examination of group variation. The study determines the essential difficulties these producers encounter through investigating how agricultural extension services contribute to enhancing digital capabilities. The research made use of the descriptive analytical framework to investigate 200 producers, consisting of 100 honey producers and 100 olive oil producers at the Al-Horreya Garden Honey and Olive Festivals in Zamalek. The research data shows that honey producers exhibit superior digital aptitudes compared to olive oil producers since they conduct regular social media activities while demonstrating proficient knowledge of electronic marketing systems. The producers showed greater enthusiasm for digital marketing during interviews. Olive oil producers showed reluctance, along with limited hands-on experience, when it comes to managing promotional efforts through advertising and selling their products through e-commerce platforms. Despite being aware of digital tools and having both basic knowledge and internet access, olive oil producers faced problems in handling the technology effectively. Agricultural extension services continue to be fundamental because they develop producers' readiness capabilities through educational programs and technical assistance, and ongoing instructional outreach. The study presents recommendations along with digital agricultural extension as the most critical component, which include practical training development and improved technology access in rural areas. The implemented measures should boost e-market possibilities for agricultural produce while simultaneously improving producers' marketing practices and economic performance.

KEYWORDS: E-Marketing, Digital Agriculture, Honey Producers, Olive Oil, Agricultural Extension, Agricultural Digital Skills.

1. INTRODUCTION

The adoption of e-marketing presents multiple benefits to producers throughout Egypt. Research demonstrates that smallholder producers gain better market access through technological integration, including e-commerce platforms that provide consumer-driven market interaction independently from intermediary service providers. Producers now benefit directly from this paradigm change because they achieve improved product prices and maintain control over consumer quality standards and product specifications (Gau & Saleh, 2024). Customer opinions about sustainable labels and organic products have turned more favourable, thus influencing how businesses approach marketing. The study focuses extensively on analysing quality characteristics of olive oil and honey because these factors determine consumer choice behaviour when making purchases. The evaluation of consumers reveals their deep interest in inherent product factors combined with their attachment to specific brand credentials and additional certification status (Carlucci et al., 2014; Sayadi et al., 2017; Vita et al., 2021). Market segmentation of customer preferences regarding attributes becomes vital for developing targeted marketing approaches for certified products, particularly among young buyers who show increased tendencies to purchase such products (Vita et al., 2021). Consumer buying behaviour develops through strong influences from local cultural elements. Studies have demonstrated that market approaches that integrate traditions alongside local cultural attributes enhance emotional customer relationships with products that boost their purchase interest (Kitagawa et al., 2020). E-marketing evolution encourages producers to embrace digital tools with awareness of regional consumer needs. Producers who use these practices thus strengthen their market visibility and support sustainable agricultural activities through accountable promotional activities (Oe & Yamaoka, 2023). The agricultural industry uses e-marketing to build essential connections between suppliers and customers, thus enabling product promotion. Producers who use e-commerce platforms can better display their products, along with establishing real-time consumer connections and extending their product range beyond what traditional marketing techniques provide (Yang, 2022; Zhang & Qiu, 2024). Through digital interfaces the purchasing process becomes clearer while marketers can conduct targeted strategies that use client behavioural and preference data (Wang et al., 2024). The acceptance of e-marketing strategies within the agricultural sector rose speedily following the COVID-19 pandemic. The initial technology sceptics in the agricultural sector were forced to implement digital systems to keep their sales operational during restricted periods. Digital marketing serves as an essential method to sustain business operations, according to Ji et al. (2023). Rural e-commerce advances producer financial performance through decreased transaction costs and stronger income structures which leads to improved standard of living according to Wang et al. (2024) and Zhang et al. (2024). The conversion to e-marketing provides multiple benefits but presents multiple obstacles for execution. The technical gap creates substantial difficulties for rural areas since they struggle to acquire proper infrastructure connectivity for technology access. The poor internet connectivity together with low digital literacy stands as a major obstacle which prevent producers from adopting e-commerce (Samsudin et al., 2024). Small-scale producers struggle to afford costly technology expenditures along with training programs at the beginning of e-marketing adoption (Nipo et al., 2024). The solution of these issues holds the potential to reveal major business prospects. The development of digital infrastructure and strategic education initiatives for enhancing the digital capabilities of producers will create effective e-commerce participation. Sufficient support enables producers to boost their market performance and strengthen their negotiation position because of better information and communication access (Jabbouri et al., 2022). By using e-marketing, small producers can conduct sales directly with consumers and earn greater profits after cutting out intermediaries (Liu et al., 2023). The merger of technology advancement with shifting consumer interests and changing market conditions drives Egyptian producers to adopt a fundamental change in their agricultural marketing practices.

2. THEORETICAL FRAMEWORK

Olive oil production, together with honey marketing, serves as a vital driver for agricultural advancement and economic development in Egypt. Olive oil and honey production demonstrate strong development potential because integration of modern agricultural practices with digital technologies and successful marketing plans will boost regional and international sector expansion. The Egyptian environment, coupled with its natural resources, allows the production of high-quality olive oil along with honey, although the industry faces various challenges. The sector faces ongoing

difficulties because of poor infrastructure alongside widespread product adulteration, together with a lack of new market opportunities that stem from keeping traditional marketing strategies. The advantages of electronic marketing serve to help producers overcome their current market challenges by building improved connections between consumers and businesses. The transition toward digital business enables organisations to increase earnings and establish brands by highlighting exceptional Egyptian products for global markets.

2.1. Olive Oil Production and Marketing in Egypt

The Egyptian market for olive oil production and distribution presents substantial possibilities to expand the economy and reach new market segments. Modern agricultural implementation combined with better branding and marketing strategies and digital usage will help Egyptian producers enhance their market success locally and globally. The olive oil sector of Egypt must focus on present-day obstacles alongside new feasible opportunities to sustainably increase its size. The Egyptian areas along the Nile Valley, along with the Nile Delta, serve as the primary regions for olive cultivation because they create a suitable climate for olive tree cultivation. The most widely grown variety of olive trees is Olea europaea, which produces premium quality oil products according to Almoselhy et al. (2019). The educational efforts about premium agricultural methods and harvesting techniques that producers accept have resulted in better oil production quality. The composition and flavor of olive oil get better due to selected cultivars grown under specific soil conditions at specific harvest time points, according to D'Imperio et al. (2010). Modern agricultural practices and technology adoption have become essential to achieve higher quality and quantity in olive oil production. Scientists stress the value of precision agriculture together with biotechnological developments for enhancing olive tree cultivation conditions, which leads to better oil quality alongside higher production efficiency (Mili & Bouhaddane, 2021; Karanikolas et al., 2021). A growing number of consumers now prefer to purchase products carrying sustainability stamps since environmental certification schemes and sustainable practices have captured increasing market attention. The growing interest among Egyptian organizations in adopting sustainable farming practices serves both domestic and international demand for certified and organic olive oil, which meets global sustainability requirements (Čehić et al., 2021; Carlucci et al., 2014) Worldwide demand for olive oil surged notably because non-traditional markets in North America and Northern Europe adopted widespread promotion of olive oil health advantages (Gontijo et al., 2020; Arfaoui et al., 2022). Egypt intends to benefit from this demand by developing its marketing strategies as an important regional producer. Digital marketing represents an effective technique for marketing Egyptian olive oil products. Strengthened through e-commerce platforms and social media, producers now connect to wider audiences while building direct consumer relationships. Research findings demonstrate that consumers are prepared to invest higher prices for PDO/PGI-certified olive oils due to their ability to authenticate superior quality and distinct territories of production (Roselli et al., 2016). The specific characteristics of Egyptian olive oil receive greater market attention once adequately promoted through digital advertising campaigns.
The existing market opportunities for Egyptian olive oil face barriers from volatile prices and strong competition against traditional producers in Italy and Spain (Mili & Bouhaddane, 2021; Xiong et al., 2014). For Egyptian olive oil marketing success, it is necessary to rebrand along with educating consumers about benefits because current perceptions link the product with lower quality than European olive oils, according to Jovanović & Joksimović (2020). Success in marketing strategies heavily depends on understanding consumer preferences in this current scenario. Research evidence demonstrates that customers buy locally produced items, including organic, traditionally flavored goods, because they have distinctive quality symbols (Gontijo et al., 2020; Muñoz et al., 2017). Egyptian producers need to tell the story of their manufacturing processes, combined with broadcasted health attributes, to attract customers. Both rebranding initiatives and consumer education about Egyptian produce along with traditionally-flavoured goods, require immediate attention. The focus of Egyptian producers should revolve around narrating their manufacturing process to customers, together with communicating beneficial health features that draw consumer interest.

2.2. Honey Production and Marketing in Egypt

The agricultural sector of Egypt depends significantly on honey production and marketing activities, which create substantial economic opportunities. The honey industry in Egypt holds great promise for expansion, thanks to its plentiful resources and expanding local market, because

proper quality improvements combined with strategic advertising and modern infrastructure projects will drive its continued expansion. The long-term success of this essential industry depends on how well Egypt addresses issues linked to market access, alongside competition and adulteration challenges. The practice of beekeeping has existed for many years in Egypt, where traditional and modern methods contribute to producing superior honey quality. The relative warmth, together with complex floral patterns that thrive mainly in the Nile Delta, creates optimal conditions for successful bee colonies. The predominant bee species found in Egyptian areas is Apis mellifera since it demonstrates both high efficiency and native adaptability to environmental elements (Tesfaye et al., 2024). The use of citrus and clover nectar-producing plants in cultivation results in Egyptian honey that stands out for its quality and distinct taste (Hegazī et al., 2022). The quality of Egyptian honey changes because of the variations between nectar resources, alongside the practices for collection and processing techniques used. The quality indicators for honey include its physical-chemical characteristics as well as its antioxidant content and sugar composition. The high phenolic content observed in Egyptian honey attracts buyers to the market even though particular producers show divergent figures (Tesfaye et al., 2024). Adulteration continues to be an active concern in the food industry because manufacturers mix high-quality honey with less expensive sugar-based substances which compromises consumer trust while damaging market prospects (Hegazī et al., 2022; Fakhlaei et al., 2020). In this regard, the Egyptian honey market shows significant development because consumers are becoming more aware of their health needs. Honey stands out for its healing properties, which lead consumers to look for this product both as a natural sweetener and a dietary supplement (Zulkifli et al., 2024). The global honey industry held a value of USD 8.53 billion in 2022, while experts expect it to grow and reach around USD 14.21 billion by 2031. Egypt has established goals to fulfill both increasing local and international market needs for honey products. Research shows that consumers between 18 to 46 prefer organic and natural products more than older population groups (Vida & Ferenczi, 2023), and these younger people prefer to buy honey through online channels or from their local markets. Digital sales platforms provide honey producers with important opportunities to reach their target consumer segments effectively, as e-commerce distinguishes itself as a major sales channel (Kumar et al., 2024). The export market for Egyptian honey produces noteworthy results through recent data showing that it reaches about 1,041.5 tons annually (Sobhi, 2024). An international demand exists for Egyptian honey because Ziziphus (sidr) tree-derived honey has received recognition as an exclusive high-value product according to Hassan et al. (2023) and El-Wahed et al. (2023). Improving the export potential of Egyptian honey needs to handle issues with quality control measures and brand development procedures while highlighting both the authenticity and distinctness of Egyptian honey production (Fakhlaei et al., 2020; Sobhi, 2024). Several problems decrease the potential growth of Egypt's honey industry despite existing market opportunities. Adulteration represents the biggest obstacle that critically reduces both product quality evaluations and local market trustworthiness among consumers. The market requires immediate implementation of effective regulations along with strict practices to guarantee the availability of pure honey (Fakhlaei et al., 2020; Zulkifli et al., 2024). The Egyptian honey producers encounter intense competition from Spain and Italy, and other well-known international markets that excel in honey production. The competitive strength of Operation depends on enhanced marketing efforts that include product range expansion and specialized markets targeting organic honey sales (Kumar et al., 2024; Hassan et al., 2023). The current market accessibility of Egyptian honey faces hurdles from insufficient storage facilities, together with restricted transportation and distribution structures. The success of Egyptian honey in domestic and international markets requires investments in better logistics systems, according to Shaaban (2022) and Zeedan et al. (2016).

2.3. Challenges Facing Producers in Traditional Marketing

The traditional marketing system creates multiple difficulties that threaten producers, especially in developing nations like Egypt. Agricultural producers at market face difficulties stemming from economic barriers, together with social constraints and structural obstacles that obstruct their product marketing success. The main difficulty producer's encounter is restricted market access, together with a lack of reasonable prices. A marketing system using intermediaries produces substantial profit reduction for producers since intermediaries include price margins on their transactions. The lack of market information creates limitations for producer negotiation power, thus making their situation worse. The lack of market price and demand data

during producer market entry means business results are negatively impacted (Kushwaha et al., 2024). The market productivity of competitors diminishes because they face restrictions in their manufacturing operations. Small production quantities from local producers cannot meet big markets' requirements, thus making it challenging for them to obtain favourable prices with major retailers (Zondi et al., 2022). The restricted market network of traditional informal systems, along with limited market access, prevents businesses from entering promising markets for higher profits (Helicke, 2019). Insufficient market information availability represents a major challenge that producers encounter in their market activities. Producers lack sufficient market knowledge about prices and standards, and quality measures as well as available opportunities, which creates higher expenses in marketplace operations (Nandi et al., 2017). The absence of market information deprives producers both financially and prevents them from developing innovative solutions or adjusting their operations during changing circumstances (Zondi et al., 2022). The knowledge acquired through years of experience helps older producers develop better market behaviors despite younger producers finding it difficult to manage market fluctuations (Ahaljith et al., 2023). The producers who obtain training and other resources demonstrate superior outcomes because they possess better knowledge and abilities (Zondi et al., 2022). The shortcomings of infrastructure result in significant adverse impacts on standard marketing strategies. A deficient transport network undermines market accessibility, which in turn increases the expenses faced by farmers for moving their goods to market consumers (Cheelo & Merwe, 2021). The producers with limited access to transportation sometimes must provide their products to local markets instead of reaching more lucrative distant markets because of this constraint. Storage facilities located in Malawi are insufficient, thus resulting in product spoilage before buyers obtain perishable goods such as fruits and vegetables (Lubaale et al., 2024). The fundamental problems encountered by suppliers in traditional marketing systems include financial challenges alongside insufficient information and poor infrastructure, and minimal organizational potential. The successful removal of these hurdles requires joint efforts and teaches skilled staff, and provides enhanced market information access together with infrastructure development. Multiple strategic efforts targeting this combination of factors will prove essential to power producers while reshaping agricultural operations in Egypt, together with other regional zones.

2.4. The Development of E-Marketing in Egypt

E-marketing solutions for Egyptian agricultural items, specifically including olive oil and honey, represent a major move towards enhancing the country's agricultural industry. Intelligent management of production becomes necessary because of technological developments, along with shifting customer demands and the requirement for companies to stay competitive in markets. Egyptian businesses used to market agricultural products by selling directly through their local markets without establishing network distribution channels or promotional initiatives. Producers now recognize e-marketing as a fundamental tool because young consumers fully embrace the internet and digital technology usage. Digital platform implementation allows producers to establish direct consumer relationships, which reduces the need for middlemen while providing market access to wider territories (Karanikolas et al., 2021). The COVID-19 pandemic created marketplace changes that drove producers and businesses to adopt online sales channels for essential adaptation to emerging market conditions and changing customer preferences. E-commerce platforms combine with social media marketing to function as vital business tools that help companies present products to customers and maintain contact with them while consumption needs for easy buying grow (Arfaoui et al., 2022). The current economic changes towards digital platforms track global movements because consumers demand quick product options at reasonable prices (Mili & Bouhaddane, 2021).

2.5. E-Marketing Strategies for Olive Oil and Honey

Hence, the success of e-marketing approaches increases due to message personalization based on consumer segments. Regulations in the olive oil sector need specialized marketing techniques that demonstrate distinct health advantages and distinct quality aspects for different olive oil types based on studies by Roselli et al. (2016) and Peršurić (2020). Brand segmentation allows manufacturers to offer premium products aimed at health-conscious consumers while continuing to reach price-sensitive segments, according to Vita et al. (2021).

Resorting to social media platforms delivers an essential marketing foundation for advertising olive oil and honey products. Through these marketing channels, producers achieve the ability to showcase brand narratives and engage consumer audiences

alongside promotions for product unique characteristics. Professional content demonstrating product creation or providing recipes helps customers establish stronger bonds, which leads consumers toward buying domestic items instead of imports (Abdallah et al., 2018).

Through online marketplaces, producers gain the ability to post inventory listings and achieve full digital control of sales and transaction management. The approach improves their business by growing client numbers and streamlining product distribution. Websites operated by Egyptian producers now display olive oil and honey products directly to consumers who seek organic regional items, according to Khursheed (2024).

2.6. Challenges in Adopting E-Marketing

Several obstacles prevent Egyptian producers from completely adopting e-marketing strategies, while promising e-business trends evolve in the market. The opinion of Muñoz et al. (2018) states that rural producers struggle to use e-marketing tools because they do not possess the required digital competencies.

The adoption rates for e-marketing by these individuals would increase dramatically after getting training on digital skills. Internet accessibility remains a major challenge for remote areas since they do not have sufficient connections. Rural areas must develop their internet infrastructure because such development opens the way for enhanced participation in e-commerce (Arfaoui et al., 2022).

The paramount importance of creating trust for online shoppers in their purchasing abilities focuses on product quality assurance systems. Flawless marketing methods, which use clear labels along with authenticity verification systems, work to address consumer concerns. The olive oil industry requires product quality assurance, like other sectors, because consumers now demand more scrutiny when selecting products (Albdady, 2023; Clodoveo et al., 2021).

2.7. Future Trends

E-marketing platforms for agriculture show positive potential in Egypt based on predicted growth in digital marketing infrastructure development. E-marketing will emerge as an essential competitive tool since consumer preferences are shifting towards healthy, sustainable choices (Čehić et al., 2021).

The worldwide olive oil and honey markets offer Egyptian producers chances to access profitable foreign markets by building advanced e-marketing strategies and joining with e-commerce platforms, according to research by Karanikolas et al. (2021) and Mikhail (2015). The combination of technology in agriculture with properly directed marketing strategies makes farming operations more sustainable and efficient while increasing profit margins.

The development of agriculture in Egypt depends strongly on e-marketing because it has created substantial changes in olive oil and honey marketing. Advanced digital marketing strategies give producers the chance to deliver marketing impact, which leads to better economic performance and increased consumer visibility. Maintaining investments in digital capabilities and foundation systems will bring about these fundamental transformations within the agricultural field.

2.8. Research Problem

The adoption rate of e-marketing tools for selling agricultural products by Egyptian producers remains minimal despite the popularity of electronics across multiple life spheres, including agriculture (Saleem et al., 2021).

Available electronic platforms receive minimal usage due to unexploited opportunities of expanded customer bases, coupled with better economic performance. Economic together with social and cultural factors, in addition to an insufficient understanding by producers, cause this gap while limiting marketing success for agricultural produce in both local and international markets. Studies must examine how producers view e-marketing together with essential elements that restrict its expansion, so experts can develop suggestions that maximize its usefulness.

2.9. Research Objectives

1. To identify the level of producers' knowledge regarding the concept of e-marketing and its various tools.
2. To determine the attitudes of producers towards adopting e-marketing in the marketing of honey and olive oil products.
3. To analyze producers' skills in using modern technology and the internet as tools for e-marketing.
4. To study the social and economic factors influencing producers' readiness to adopt e-marketing, such as age, education level, and geographical location.
5. To explore the obstacles and challenges that producers face in adopting e-marketing.
6. To determine the role of agricultural extension

in improving producers' knowledge and skills in using e-marketing.

3. RESEARCH METHODOLOGY

The descriptive-analytical method was employed to study the attitudes of producers towards the use of e-marketing. A survey was administered to a purposive sample of 200 participants, randomly selected from attendees of the Egyptian Honey Festival and the Egyptian Olive Festival. These events were chosen because they gathered a large number of producers specializing in honey and olive oil, which facilitates access to diverse and direct opinions from stakeholders in the sector.

The research sample was divided into two equal groups:

- 100 honey producers, selected from attendees of the Egyptian Honey Festival held at the Freedom Park in Zamalek, under the supervision of the Arab Beekeepers Union and sponsored by the Ministry of Agriculture, the Ministry of Trade and Industry, the Ministry of Supply, and the Ministry of Tourism.
- 100 olive oil producers, selected from attendees of the Egyptian Olive Festival, also held at the same location (Freedom Park in Zamalek) from November 27-30, 2024.

4. RESULTS

4.1. First: Producers' Knowledge of E-Marketing Concept and Tools

Table 1 illustrates the extent of marketing knowledge both honey producers and olive oil producers possess regarding e-marketing principles as well as its available tools. Honey producers demonstrated better comprehension of digital marketing principles than olive oil producers, since 92% of honey producers utilized the internet and social media tools for promotion, while olive oil producers reached only 78% understanding. Recent studies by Gau & Saleh (2024) and Ji et al. (2023) point out how age, along with geographic position and level of education, creates individual variances between producers that determine their digital tool engagement capabilities.

The research results validate the study presented by Samsudin et al. (2024) about how rural area digital inequalities affect e-marketing adoption effectiveness. Additionally, the data shows that honey producers understand the advantages of e-marketing better, like reaching new customers and growing their markets. This supports Zhang & Qiu's (2024) findings that the use of digital technologies in a proper way can help to promote marketing and allow agricultural producers to develop economically.

However, even with this strong theoretical insight, there is still a gap in implementing advanced tools, including running e-commerce websites like "Souq.com" and "Amazon," where olive oil producers are less experienced. Although there is considerable theoretical knowledge, there is little practical application of sophisticated tools, particularly in managing the e-commerce websites "Souq.com" and "Amazon," where olive oil manufacturers indicated lesser levels of familiarity.

This discovery can be traced to the gaps in the level of digital literacy among some of the producers, as Muñoz et al. (2018) defined. This dictates the imperative for successful farming extension policies towards providing personalized extension and awareness activities, a stance also advocated by Jabbouri et al. (2022) and Oe & Yamaoka (2023). All these findings collectively suggest that encouraging e-marketing among agricultural producers in Egypt is not only an issue of raising awareness but also involves attempts at systematically, technically, and skillfully preparing the producers, providing infrastructure, and guaranteeing continuous technical support.

This would bridge the gap between knowledge and application, achieving the optimum benefits of digital transformation in marketing agricultural products. A breakdown of producers exists in Table 2 through three expertise segments based on their e-market proficiency: high and medium, and low levels of expertise. Data reveals how 62% of honey producers possess "high knowledge" while the remaining participants belong to the standard range between "high" and "low knowledge." The study shows that 28% of honey producers hold medium e-marketing knowledge, while 10% possess low knowledge about this field. The pattern of knowledge among olive oil producers exhibits diversification since they contain 38% high knowledge stakeholders, while 40% hold medium knowledge status, alongside 22% low knowledge stakeholders. The findings match those reported by Wang et al. (2024) and Saleem et al. (2021) who identified the digital knowledge division present in agricultural producers due to technology exposure and training opportunities and institutional support.

Kumar et al. (2024) reported that honey producers gained remarkable benefits through e-commerce abilities to target diverse consumer segments based on their market dynamics study results. The collected data shows that improving digital skills among olive oil producers matters because they

currently exhibit low and intermediate knowledge levels. A person with insufficient knowledge would exhibit these characteristics. According to Samsudin et al. (2024), e-marketing tool implementations in rural communities fail due to the lack of digital competencies. According to Jabbouri et al. (2022) and Nipo et al. (2024), proper training programmes should be developed to support olive oil producers in their transition to better electronic marketing practices. Digital tools can assist producers to develop critical capabilities that will furnish them with heightened market competitiveness in expanding digital platforms.

Table 1: Producers' Knowledge of E-Marketing and Its Tools.

Statement	Honey Producers	Olive Oil Producers
E-marketing is the use of the internet to sell and promote products.	92%	78%
E-marketing helps in reaching a larger number of customers.	90%	75%
E-marketing is done via the internet and social media platforms.	88%	72%
E-marketing requires understanding the target audience and their needs.	85%	60%
E-marketing allows producers to reach new markets outside their geographical areas.	83%	58%
Offering discounts and promotions online helps attract customers and encourages them to buy honey and olive oil.	87%	62%
Producers can use social media platforms like Facebook and Instagram to promote honey and olive oil.	89%	76%
Through e-commerce sites like "Souq.com" and "Amazon," honey and olive oil can be sold to large customer segments.	80%	54%
Paid ads on social media platforms help increase awareness and reach new customers for honey and olive oil products.	86%	59%
Creating visual content like photos and videos is one of the best ways to promote honey and olive oil online.	91%	73%
Using platforms like YouTube to show how to use honey and olive oil can be an effective way to attract customers.	84%	61%
Collaborating with influencers on social media can boost honey and olive oil sales through effective product promotion.	88%	57%

Source: Field Data, 2024.

Table 2: Distribution of Producers According to Their Knowledge Level.

Knowledge level	Honey producers	Olive oil producers
High knowledge (9-12)	62%	38%
Medium knowledge (5-8)	28%	40%
Low knowledge (1-4)	10%	22%
Total	100%	100%

Source: Field Data, 2024

4.2. Producers' Attitudes toward Adopting E-Marketing

Table 3 presents the attitudes of honey and olive oil producers towards adopting e-marketing for their product promotion. Honey producers have a generally positive attitude towards using digital tools, with average ratings ranging from 2.69 to 2.85. This reflects their general belief in the effectiveness of e-marketing to reach a larger number of customers, save time and effort, and enhance promotional opportunities compared to traditional methods. This positive attitude is supported by Yang (2022) and Wang et al. (2024), who highlighted that e-marketing improves marketing efficiency and expands the market for producers, especially as consumer behavior evolves and online purchasing increases, as seen in the growing demand for honey from younger health-conscious consumers (Vida & Ferenczi, 2023). On the other hand, olive oil producers show noticeable hesitation, with average ratings ranging from 2.11 to 2.52, indicating a more neutral or cautious stance towards adopting e-marketing. Statements like "I feel comfortable interacting with customers through online platforms" (average 2.13) reflect this hesitancy, which may be due to a lack of full confidence or limited experience with digital media. This aligns with the findings of Muñoz et al. (2018) and Clodoveo et al. (2021), who suggested that the lack of skills and confidence might pose a barrier to adopting more modern marketing models among some farmer groups. However, some statements, such as "I believe e-marketing will help me reach new markets" (2.11), indicate initial awareness of the potential of these tools, even if it has not yet translated into actual adoption. This reinforces the idea that digital transformation requires continuous institutional support and practical training to build confidence and overcome cultural and professional barriers, as emphasized by Erraach et al. (2021). Therefore, the gap between the two groups is not only about knowledge but also "conviction and psychological readiness," which implies that agricultural extension programs should not focus solely on technical training but also address motivational and cultural aspects influencing adoption decisions, as recommended by Oe & Yamaoka (2023) and Jabbouri et al. (2022) in their studies on digital agricultural marketing.

Table 3: Producers' Attitudes toward Adopting E-Marketing for Honey and Olive Oil Products.

	Statement	Honey producers				Olive oil producers			
		Disagree	Neutral	Agree	Mean	Disagree	Neutral	Agree	Mean
1	I believe that e-marketing helps me reach a larger number of customers.	8	15	77	2.69	15	30	55	2.33
2	I feel comfortable interacting with customers through electronic platforms.	7	12	81	2.74	18	40	42	2.13
3	I believe e-marketing saves time and effort compared to traditional methods.	4	10	86	2.82	18	35	47	2.15
4	I consider e-marketing an effective tool for promoting my agricultural products.	6	13	81	2.75	20	33	47	2.13
5	Through e-marketing, I can respond more quickly to customers and meet their needs.	4	11	85	2.81	17	38	45	2.15
6	I believe e-marketing will help me access new markets outside my local area.	8	7	85	2.77	22	31	47	2.11
7	E-marketing is less reliable than traditional methods for marketing agricultural products.	90	5	5	2.85	60	25	15	2.45
8	I think e-marketing is unsuitable for agricultural products.	85	10	5	2.8	65	22	13	2.52
9	I do not see any real benefit from using the Internet to market agricultural products.	90	5	5	2.85	55	33	12	2.43
10	I believe traditional marketing is safer and more effective than e-marketing.	8	15	77	1.31	60	26	14	2.46

Source: Field Data, 2024. Interpretation Scale: (1.0–1.5 = Negative), (1.6–2.5 = Neutral), (2.6–3.0 = Positive).

4.3. Digital Skills of Honey and Olive Oil Producers

Table 4 highlights the disparity in digital skills between honey and olive oil producers in using modern technology and the Internet for e-marketing purposes. The data indicate that honey producers possess higher basic digital competencies, particularly in creating social media accounts (85%), producing visual content (70%), and conducting electronic transactions (46%). This reflects a closer engagement with contemporary digital marketing tools. These findings align with those of Wang et al. (2024) and Liu et al. (2023), who emphasized the importance of building foundational digital skills among agricultural producers as a critical step toward integration into the digital economy, especially in light of the growing e-commerce landscape and consumers' increasing reliance on digital platforms for purchasing food and organic products. Conversely, technical skills appear weaker among olive oil producers. Only 24% reported being capable of conducting electronic transactions, and no more than 65% demonstrated skills in producing visual content.

Table 4: Producers' Skills in Using Modern Technology and the Internet for E-Marketing.

Statement	Beekeepers (%) – Skilled	Beekeepers (%) – Not Skilled	Olive Oil Producers (%) – Skilled	Olive Oil Producers (%) – Not Skilled
1. I can create social media accounts (e.g., Facebook, Instagram) to promote my products.	85	15	79	21
2. I know how to create visual content (photos and videos) to market agricultural products online.	70	30	65	35
3. I can manage paid advertising campaigns on social media platforms to increase product sales.	53	47	46	54
4. I can use e-commerce platforms (e.g., Souq.com, Amazon) to showcase and sell my products.	34	66	27	73
5. I know how to identify the target audience for my online marketing campaigns.	25	75	21	79
6. I am able to use design tools (e.g. Canva, Photoshop) to create promotional materials for my agricultural products.	18	82	13	87
7. I can conduct online transactions easily, such as buying and selling through digital platforms.	46	54	24	76

(Source: Field Data, 2024).

This gap may be attributed to factors such as limited technical training or lack of prior experience. As Muñoz et al. (2018) argued, digital skills go beyond mere access to devices; they also require a functional understanding of how to utilize these tools effectively for product promotion. From a more specialized perspective, the results reveal that both groups suffer from a significant lack of advanced skills, such as managing paid advertising campaigns or using e-commerce platforms like Souq.com and Amazon, as well as design tools like Canva or Photoshop. Fewer than 35% of honey producers and only 27% of olive oil producers reported being proficient in using such platforms. This supports Jabbouri et al.'s (2022) conclusion that the real barrier to digital transformation lies in the absence of precise, applied skills rather than theoretical knowledge alone.

These indicators underscore the urgent need for the design of training and advisory programs focused on enhancing producers' proficiency in advanced technical areas. A practical, hands-on approach should be adopted, as recommended by Samsudin et al. (2024) and Nipo et al. (2024), who stressed the necessity of establishing an integrated support environment that includes both technical training and ongoing mentorship. In light of the above, investing in the development of advanced digital skills is not a luxury but an essential requirement to ensure that producers are engaged in a competitive and rapidly evolving marketing environment. This would empower them to maximize their economic returns, expand their customer base, and keep pace with modern market demands.

4.4. Barriers and Challenges Faced by Producers in Adopting E-Marketing

Table 5 illustrates a clear variation in the perceived barriers hindering honey and olive oil producers from adopting e-marketing strategies. This highlights the differences in the technical and practical challenges faced by each group. For honey producers, the most significant barrier was the "inability to create a website or digital store" (72%), followed by "weak photography and design skills" (66%), and "difficulty using online platforms" (54%).

These findings indicate a practical technical gap, even though, according to the previous tables, their theoretical knowledge is relatively good. This discrepancy between knowledge and practice reflects the observation by Zhang and Qiu (2024) that challenges in the digital agricultural sector are no longer about understanding concepts but rather about applying tools, especially among small-scale producers. In comparison, olive oil producers exhibited a similar but more pronounced pattern in terms of skills. For them, "weak photography and design skills" ranked highest (78%), followed by "difficulty using online platforms" (75%), and "low online demand" (72%). This suggests that this group faces dual obstacles: on the one hand, a lack of technical skills, and on the other, a cautious perception of the value of digital marketing. These findings are consistent with those of Muñoz et al. (2018) and Khursheed (2024), who noted that psychological barriers and preconceived notions about e-marketing channels represent an additional hurdle in some traditional agricultural sectors. Interestingly, barriers such as "lack of knowledge of e-marketing" and "limited internet access" ranked lower for both groups.

This suggests a relative improvement in infrastructure and initial awareness, which aligns with the findings of Saleem et al. (2021) and Samsudin et al. (2024), who emphasized that the challenge is no longer access to technology, but rather the development of skills and the provision of continuous practical training. Based on the above, there is a pressing need to develop advisory programs that focus on applied skills, particularly in content creation, platform usage, and the design of engaging marketing campaigns. Moreover, providing ongoing technical support and hands-on guidance would help reduce the gap between knowledge and application, enabling producers to fully capitalize on the opportunities offered by digital marketing, as recommended by Jabbouri et al. (2022) and Nipo et al. (2024) in their studies on empowering rural producers within the digital economy.

Table 5: Barriers and Challenges Faced by Farmers in Adopting E-Marketing.

Statement	Beekeepers (%) – Agree	Beekeepers (%) – Disagree	Rank	Olive Oil Producers (%) – Agree	Olive Oil Producers (%) – Disagree	Rank
1. Weak knowledge of e-marketing.	29	71	9	33	67	7
2. Difficulty in accessing the internet consistently.	15	85	10	31	69	8
3. High costs of digital advertising.	46	54	6	51	49	5
4. Lack of trust in electronic payments.	38	62	8	48	52	6
5. Weak skills in photography and design.	66	34	2	78	22	1
6. Lack of technical or advisory support.	53	47	4	27	63	9
7. Difficulty in using e-commerce platforms.	54	46	3	75	25	2
8. Low demand online compared to direct selling.	47	53	5	72	28	3
9. Inability to create a website or online store.	72	28	1	66	34	4
10. Concerns about competition online.	44	56	7	23	77	10

(Source: Field Data, 2024)

4.5. The Role of Agricultural Extension in Enhancing Respondents' Knowledge and Skills in Using E-Marketing

Table 6 highlights the significant role that agricultural extension can play in supporting producers, both honey and olive oil producers, in developing their knowledge and skills related to e-marketing. The results demonstrate a broad consensus among both groups that extension interventions are essential to address the challenges of digital transformation, particularly in light of the skill gaps revealed in previous tables. The data show that olive oil producers expressed a greater interest in receiving such support. The highest levels of agreement were found in statements related to training on social media platforms (88%), organizing meetings with e-marketing experts (86%), and conducting awareness campaigns (87%). This suggests a growing awareness among olive oil producers of the need for structured guidance to compensate for their relative delay in acquiring digital skills.

These findings are consistent with Saleem et al. (2021) and Geng and Xue (2023), who emphasized that digital empowerment in the agricultural sector requires systematic educational interventions that build confidence and support the practical adoption of

technology. Similarly, honey producers also showed clear interest in the role of extension services, although their levels of agreement were comparatively lower. This may reflect their perception of already possessing a basic level of digital competence. Their key demands were focused on practical aspects such as "training on the use of social media platforms" (72%), "implementing awareness campaigns" (71%), and "assistance in communicating with customers" (69%), all of which are closely linked to hands-on digital marketing. These results support the conclusions of Jabbouri et al. (2022) and Oe and Yamaoka (2023), who argued that agricultural extension services must be restructured to align with the shifts of the digital economy. This includes a focus on practical training, technical support, individualized consulting, and the creation of interactive platforms that connect producers with experts and marketing entities. The above findings suggest that agricultural extension is no longer viewed merely as a channel for delivering traditional agricultural knowledge, but rather as a strategic tool to enhance digital capacities and build a continuous learning environment that enables producers to integrate into modern value chains. As noted by Ji et al. (2023) in their study on e-commerce in rural communities, the core recommendation is to adopt a modern digital agricultural extension model one that combines vocational training, practical support, and technical mentorship. Such a model would help bridge the gap between producers' current capabilities and the evolving demands of digital markets.

Table 6: The Role of Agricultural Extension in Enhancing Respondents' Knowledge and Skills in E-Marketing.

Statement	Beekeepers (%) – Agree	Beekeepers (%) – Disagree	Olive Oil Producers (%) – Agree	Olive Oil Producers (%) – Disagree
1. Training producers on using social media for marketing.	72	28	88	12
2. Offering courses on creating websites and online stores.	68	32	85	15
3. Guiding producers to use paid advertisements to increase visibility.	64	36	80	20
4. Directing producers to appropriate e-commerce platforms.	70	30	84	16
5. Providing technical support to resolve digital issues.	66	34	82	18
6. Offering one-on-one consultations to select appropriate marketing strategies.	60	40	78	22
7. Training producers on creating attractive visual content.	65	35	81	19
8. Organizing meetings with e-marketing experts.	67	33	86	14
9. Assisting producers in building effective online communication with customers.	69	31	83	17
10. Conducting awareness campaigns on the benefits of e-marketing.	71	29	87	13

(Source: Field Data, 2024).

The anticipated task of agricultural extension for improving producer knowledge and e-marketing skills emerges from Table 6 through the responses obtained from honey and olive oil producers. Participant agreement on this role is extensive according to the survey results, while olive oil producers exhibited the highest level of approval. The data illustrates producers' awareness about the necessity of receiving extension support to deal with digital transformation requirements. Around 88% of olive oil producers approved of "Training producers on social media platforms," along with 86% agreeing on "Organising meetings with e-marketing experts" and a similar 87% support for "Implementing awareness campaigns." The survey data shows that olive oil producers want direct interaction and structured learning to learn more and build awareness because of their interest in both. While honey producers expressed evident interest in extension activities, the approval rates they registered remained below those of the olive oil producers.

The survey results demonstrated that beekeepers prioritised training in social media applications for their producers over implementing awareness initiatives and customer communication assistance (69%), which highlighted their understanding of essential marketing skill development. The analysed data indicates that extension services must focus on delivering training programmes through which producers learn digital skills because both groups agree extension institutions should lead digital capacity development efforts.

5. DISCUSSION

The study results reveal clear variations in knowledge, skills, and attitudes between honey and olive oil producers regarding the use of e-marketing, reflecting differences in their level of digital readiness and their ability to engage with modern technological tools. As shown in Tables 1 and 2, honey producers demonstrated a higher level of knowledge about e-marketing concepts than olive oil producers, with more than 62% reporting a high level of knowledge compared to only 38% among olive oil producers. This finding aligns with Wang et al. (2024) and Ji et al. (2023), who noted that early adopters of e-commerce

often have stronger foundational knowledge and higher engagement with digital platforms.

Regarding attitudes toward e-marketing (Table 3), the results show that honey producers have a more positive inclination toward adopting these tools, with averages ranging from 2.69 to 2.85. The respondents demonstrate their solid embrace of e-marketing because they recognise its ability to enhance customer connections while reducing costs. Olive oil producers demonstrated attitudes that were neither positive nor negative toward digital solutions, according to Muñoz et al. (2018), who explained that implementation failure originates from capability limitations and psychological barriers, and learned experiences. A substantial deficiency in the application of practical abilities, especially in advanced competencies like campaign management and e-commerce capabilities, emerges from the data at the skills level across both groups, according to Table 4. Based on Jabbouri et al. (2022) and Samsudin et al. (2024), successful digital transformation in agriculture necessitates training that combines theoretical knowledge with practical implementation for developing competent online marketing practices.

The data from Table 5 affirmed the skill gap because both groups reported "weak photography and design skills" and "inability to create an online store" as significant challenges specifically for honey producers, yet "difficulty using platforms" and "low online demand" primarily affected olive oil producers. These challenges are consistent with Nipo et al. (2024) and Khursheed (2024), who identified weak digital culture and lack of practical skills as major barriers to digital marketing adoption, especially in rural areas. In this context, the results of Table 6 show broad agreement among producers on the importance of agricultural extension in supporting digital transformation. Most producers—particularly olive oil producers—expressed a need for training, technical support, and advisory services. This finding aligns with Oe and Yamaoka (2023) and Geng and Xue (2023), who argued that the success of digital agricultural marketing depends on specialized extension services that provide practical guidance and ongoing professional support.

The outcomes from the study demonstrate that honey producers demonstrate higher levels of digital readiness because they operate within more active marketing networks and actively use online platforms since an early stage. The olive oil industry needs comprehensive assistance, which includes staff training, together with behavioural modification and establishment of e-marketing effectiveness trust. The implementation of integrated digital extension programmes serves as a strategic tool for developing the readiness level of both groups until their capabilities match electronic market requirements. These findings support the strategies proposed by Saleem et al. (2021) and Erraach et al. (2021) for solving digital transformation gaps in agriculture.

6.1. Practical Significance of Findings and Future Prospects

The findings of this study demonstrate clear practical relevance that can be harnessed to develop agricultural marketing strategies in Egypt, particularly concerning empowering producers to adopt e-marketing tools effectively. The revealed gaps in digital knowledge and skills emphasize the need for applied programs aimed at enhancing producers' digital capacities, thereby contributing to sustainable development and improving the economic efficiency of the agricultural sector.

6.2. Future Prospects

The results also open the door to several complementary research avenues, including:

- Studying the impact of digital transformation on producers' direct economic performance (e.g., income, customer base, and sales volume).
- Analyzing digital consumers' preferences regarding locally marketed products.
- Exploring the role of women and rural youth in leading digital marketing initiatives in the agricultural sector.
- Evaluating the current local digital platforms used by producers and assessing their effectiveness.

Hence, the significance of the results goes beyond the theoretical level, representing a launch point for improving the landscape of digital agricultural marketing in Egypt. This supports the country's orientation toward digital transformation and green economy development and contributes to achieving the Sustainable Development Goals (SDGs), particularly those related to poverty reduction, decent work, and responsible consumption.

6.3. Study Limitations and Constraints

Despite the significance of the findings and their contribution to understanding the attitudes of olive oil and honey producers toward e-marketing, the study faced several limitations and constraints that should be considered when interpreting the results, as follows:

1. ***Geographical Boundaries*:** The study was limited to olive oil and honey producers

participating in the Freedom Festivals for Honey and Olives held in the Zamalek area of Cairo. This may affect the generalizability of the results to producers in other regions of Egypt, which may have different economic and social conditions.

2. ***Sample Size and Nature:*** The study relied on a purposive sample of 200 producers (100 honey producers and 100 olive oil producers), which may not necessarily reflect the general attitudes of all producers, especially since the sample was selected from voluntary festival participants.
3. ***Self-Report Bias:*** As the data were collected through questionnaires and direct interviews, some responses may have been influenced by participants' desire to present themselves in a positive or socially acceptable manner, potentially introducing bias into the findings.
4. ***Rapid Changes in the Digital Marketing Environment:*** Due to the rapid development of digital marketing technologies and e-commerce methods, some of the study's findings may become less accurate over time unless followed by future studies that update the data regularly.

7. RECOMMENDATIONS

1. Design applied training programs to enhance producers' skills in using e-marketing tools, especially in content creation, advertising campaign management, and the use of e-commerce platforms.
2. Strengthen the role of digital agricultural extension through individualized consultations, workshops, and meetings with e-marketing experts.
3. Focus on less digitally prepared groups, such as olive oil producers, by providing ongoing technical support and practical training tailored to their specific needs and socio-economic conditions.
4. Improve digital infrastructure in agricultural areas, particularly by enhancing internet connectivity and providing the necessary hardware and software tools.
5. Collaborate with local and international e-commerce platforms to create new marketing opportunities for honey and olive oil products, and build producers' confidence in online sales.
6. Encourage agricultural cooperatives and specialized associations to act as intermediaries between producers and digital platforms, offering group-based digital guidance and support services.
7. Conduct further studies on the economic returns of e-marketing, consumer behavior, and the role of youth and women in driving digital transformation in agriculture.

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