



Innovative Marketing of Agricultural Products in the Era of Digital Transformation: A SWOT Analysis of Global Experiences

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Abstract:

This study aims to analyze the role of innovative marketing in improving the marketing of agricultural products in the era of digital transformation by examining successful global experiences such as the Netherlands, China, India, and France. A SWOT analysis is used to identify the strengths, weaknesses, opportunities and threats associated with each experience. The study adopts a descriptive and analytical approach to assess the impact of digital technologies such as e-commerce, artificial intelligence, and the Internet of Things (IoT) on enhancing market access for agricultural products. The findings reveal that digital transformation enhances the efficiency of agricultural marketing and reduces the role of intermediaries, but it requires strong digital infrastructure and training for farmers on modern technologies. The study also emphasizes the need for government policies and technological investments to ensure the sustainability of digital agricultural marketing.

Keywords: Innovative marketing, digital transformation, agricultural products, SWOT analysis.

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1. INTRODUCTION

The agricultural sector has witnessed rapid advancements due digital transformation and the increasing reliance on innovative technologies to enhance production and marketing. With the widespread use of modern technologies such as artificial intelligence (AI), the Internet of Things (IoT), and blockchain, innovative marketing has become a crucial factor in improving the competitiveness of agricultural products. Many leading countries in the agricultural field have adopted digital marketing strategies, making it essential to study the effectiveness of these strategies and their applicability in different contexts

The agricultural sector in many countries faces challenges related to marketing agricultural products, whether due to difficulties in market access or the dominance of intermediaries in distribution channels. In the context of digital transformation, new marketing strategies based on modern technologies have emerged, necessitating an assessment of their effectiveness and potential for wider adoption. So, **How can innovative marketing, in the era of digital transformation, improve the marketing of agricultural products, and how successful are global experiences in this field?**

Sub-questions:

- What is the concept of innovative marketing, and what is its significance in the agricultural sector?
- How has digital transformation influenced agricultural marketing strategies?
- What are the most prominent global experiences in this field?
- What are the strengths, weaknesses, opportunities and threats (SWOT) of each experience?
- How can these experiences be leveraged to enhance agricultural marketing in other countries?

2. The Importance of the Research

- Highlighting the importance of **innovative marketing** in enhancing the agricultural sector.
- Demonstrating the role of **digital transformation** in developing agricultural marketing strategies.
- Providing a **comprehensive analysis** of successful global experiences to serve as models for other regions.
- Offering **recommendations** to improve agricultural marketing based on insights from these experiences.

3. Research Objectives

This study aims to:

- Analyze the relationship between **digital transformation and agricultural marketing**.
- Examine **successful global experiences** in digital agricultural marketing.
- Conduct a **SWOT analysis** to understand the key factors of success and challenges.
- Provide **recommendations** for developing agricultural marketing in emerging economies based on global best practices.

4. Research Methodology

The study adopts a **descriptive and analytical approach**, where various digital marketing strategies in the **agricultural sector** are described and analyzed based on **global experiences**. A **SWOT analysis** is employed to assess the strengths, weaknesses, opportunities and threats associated with each experience.

Theoretical Framework

1. Innovative Marketing

1.1 Innovative Marketing definition

According to Philip Kotler innovative marketing must be a part of marketing concept and strategy that significantly different from the original marketing methods, marketing innovation is based on the understanding that adhering to existing marketing rules alone is not enough to ensure success and competitiveness in crowded markets. (Ottakar Ungerman, 2018, p. 133), OECD (The Organisation for Economic Co-Operation Development) defined innovative marketing as the implement of new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing. (الجبار، 2021، صفحة 288)

Apparently these definition have the same perspective about the innovative marketing, and according to our analysis we can say that *"innovative marketing is a new innovative strategy and method in any element of mix marketing (whether it is in the production or a new pricing strategy or in the promotion ...ect) to ensure the sustainability and the success of the organization"*.

Innovative marketing plays a very important role in business environment: (Sultan Mohammad Said Sultan Freihah, 2020, pp. 266-267)

- **Importance for organizations:** Innovative marketing gives organizations a competitive edge by strengthening their brand image and reputation, helping them stand out and grow in the market.
- **Importance for customers:** Innovative marketing benefits both organizations and individuals by fulfilling customers needs, improving existing solutions, and reducing costs.

- **Importance for society:** Innovative marketing benefits organizations, customers, and society by improving living standards and boosting the economy. In international marketing, it enhances competitiveness and helps developing countries secure foreign currency.

1.2 Types of innovative marketing

Innovative marketing is divided into several types, based on a set of bases which are: (راهم، 2022، صفحة 737)

- **According to Mass-Marketing concept:** it's all about goods and services, people, places and ideas.
- **According to the organization concept:** its objectives, its core activity, its ownership and depending on the organization's marketing strategies.
- **According to the organization efficiency:** the objective of the organization in solving problems, facing an undesirable phenomenon, or the objective of improving the organization performance.
- **According to the Mix-Marketing:** each department of the organization seeks to work according to the goal of innovative marketing.

2. Agricultural Products:

2.1 Agricultural Products Definition:

Agriculture is the science and practice of cultivating soil, growing crops, and raising livestock. Agricultural products support sustainability by using resources efficiently while preserving biodiversity (Juan F. Velasco-Munoz, 2021). And it refers to goods derived from agricultural activities, including crops, livestock and other farm-produced food items, which require traceability systems to ensure safety, transparency and quality assurance throughout the supply chain and according to the previous researchs, the importance of agricultural products includes (Paola Sánchez-Bravo, 2020):

- **Environmental and Sustainability Impact:** Agricultural products are crucial for sustainable development as they influence environmental, social and economic factors. Sustainable agricultural practices help in conserving natural resources, reducing greenhouse gas emissions and promoting biodiversity.
- **Economic and Social Benefits:** Agriculture plays a fundamental role in food security, employment and economic stability. It supports local farmers, promotes fair trade and enhances rural development. Moreover, small farmers contribute significantly to sustainability by ensuring efficient resource use.
- **Consumer Perception and Demand:** Consumers are increasingly aware of sustainability issues and prefer agricultural products produced under environmentally friendly conditions. However, affordability and willingness to pay for sustainable products vary across different regions.

- **Health and Nutrition:** Agricultural products, especially organic and locally sourced foods are often associated with better health benefits. Organic farming methods help in reducing chemical contamination, improving food safety, and providing higher nutritional value.

These factors highlight the crucial role of agricultural products in maintaining ecological balance, economic stability and societal well-being.

2. Types of Agricultural Products:

2.1 Plant-Based Agricultural Products: These include cereals (wheat, rice, maize, sorghum), legumes (beans, lentils, soybeans), fruits and vegetables (apples, bananas, tomatoes, potatoes), oilseeds and nuts (sunflower, peanuts, almonds), fiber crops (cotton, flax), sugar crops (sugarcane, sugar beet), and medicinal plants (ginseng, aloe vera). However, aflatoxin contamination is a major concern, especially in cereals and nuts, which are highly susceptible to fungal infections during cultivation and storage.

2.2 Animal-Based Agricultural Products: This category includes meat (beef, pork, lamb, poultry), dairy products (milk, cheese, butter, yogurt), eggs, fish and seafood, and honey. These products are vital for nutrition and economic trade.

2.3 Forestry and Other Agricultural Products: These include timber, wood, resin, latex, ornamental flowers, and landscaping plants, which serve industries such as construction, paper production, and horticulture.

2.4 Industrial Agricultural Products: Agriculture also supports industries with biofuels (ethanol, biodiesel), fiber for textiles (cotton, wool, silk), and raw materials for pharmaceuticals and cosmetics.

2.5 Agricultural Inputs and Support Products: This category includes fertilizers, pesticides, herbicides, animal feed, and seeds, which enhance productivity and sustainability in agriculture (Tudi, et al., 2021).

3. the role of Innovative marketing strategies in agricultural products in the digital era:

Innovative marketing plays a crucial role in enhancing the visibility, competitiveness and success of agricultural products by adapting to changing consumer preferences and market trends. Market research and strategic planning allow businesses to anticipate demand, differentiate their products and reduce risks associated with new product launches. As sustainability and ethical sourcing become priorities for consumers, agricultural businesses must emphasize branding and product differentiation by highlighting eco-friendly farming methods, nutritional benefits and traditional production techniques. The rise of digital marketing and modern promotional strategies has transformed how agricultural products reach consumers with social media, e-commerce platforms and digital storytelling helping businesses engage directly with their audience. Transparency in farm-to-table marketing fosters trust while value-added innovations such as organic certifications, sustainable packaging and interactive marketing enhance product

appeal. Additionally, leveraging influencer marketing, loyalty programs and experiential campaigns strengthens consumer relationships and boosts brand loyalty. Ultimately, innovative marketing not only drives sales and market expansion but also ensures long-term sustainability by aligning agricultural businesses with evolving technological advancements and consumer expectations (Larina, 2017).

3.1 Marketing innovative technology tools used in agricultural products:

Innovative marketing in agriculture relies heavily on **digital technologies** to enhance efficiency, optimize sales and expand market reach. One of the most impactful tools is **smart data analytics**, which gathers real-time information from sensors, drones and farm management software to analyze consumer behavior and market demand. **Artificial intelligence (AI) and machine learning** further refine marketing strategies by predicting pricing trends, sales forecasts and customer preferences. These technologies allow agribusinesses to make data-driven decisions, reducing risks and maximizing profits. Additionally, **blockchain technology** is increasingly used for supply chain transparency, ensuring product traceability and boosting consumer trust. By providing verifiable sourcing information, blockchain enhances credibility, particularly for organic and sustainable agricultural products. Another critical advancement is the rise of **e-commerce and digital marketing platforms**, which enable direct-to-consumer sales and reduce reliance on traditional distribution channels. Social media advertising, targeted digital campaigns and online marketplaces help farmers and agribusinesses reach wider audiences while improving brand visibility. **Mobile applications and automated communication tools** enhance customer engagement through personalized marketing, direct messaging and loyalty programs, fostering stronger consumer relationships. Moreover, **Internet of Things (IoT) and precision agriculture** improve product quality, allowing businesses to market their produce as fresher, more sustainable and efficiently grown. By integrating these digital tools, agricultural businesses can enhance competitiveness, build consumer trust and drive long-term success in an increasingly digital marketplace (A A Stupina, 2021)

3.2 Innovative marketing strategies in agricultural products:

The innovative marketing strategies in agricultural products across production, pricing, promotion and distribution:

➤ Production Strategies

1. **Product Differentiation & Attributes** Ensuring high-quality attributes such as freshness, organic certification and sustainable farming techniques to enhance customer satisfaction and purchase intention.
2. **Technology Integration** Using smart farming techniques, precision agriculture and data-driven production to improve efficiency and meet market demands.

➤ Pricing Strategies

1. **Value-Based Pricing** Setting prices based on product quality, organic certification, and consumer perception of value.

2. **Dynamic Pricing Models** Adjusting prices according to market demand, seasonal availability, and consumer preferences (H. Fu1 Z. Liu W. Zhu, 2024).

➤ **Promotional Strategies**

1. **Content Marketing** Using educational and engaging content such as blogs, videos, and social media posts to inform consumers about product benefits, sustainability, and recipes.
2. **Influencer Marketing** Collaborating with agricultural specialists, food bloggers, and social media influencers to endorse products and increase brand awareness.
3. **Digital Engagement** Leveraging interactive and immersive experiences, such as virtual farm tours, live streaming, and customer testimonials.
4. **digital advertising, brand positioning, and multi-channel marketing** including TV, radio, billboards, and international collaborations expand market reach and attract global consumers, as seen in the case of **Deglet Nour dates** (2023، راضية)

➤ **Distribution Strategies**

1. **E-commerce and Online Marketplaces** Expanding sales through digital platforms, ensuring a wider reach and convenience for consumers.
2. **Direct-to-Consumer (DTC) Sales** Establishing direct sales channels, such as farm-to-table models, subscription boxes, and farmers' markets.
3. **Smart Logistics & Cold Chain Management** Implementing advanced distribution strategies to ensure product freshness and efficiency in transportation (H. Fu1 Z. Liu W. Zhu, 2024).

These strategies collectively enhance customer satisfaction, increase purchase intent, and create competitive advantages in the agricultural market.

SWOT Analysis of Global Experiences

1. The Dutch Experience: Smart Farming and Digital Marketing

The Netherlands has successfully integrated smart farming technologies into its agricultural marketing strategies, utilizing AI-driven applications, precision agriculture and digital platforms like "Picnic" to enhance efficiency, productivity and market transparency. Its advanced digital infrastructure supports direct-to-consumer e-commerce, allowing farmers to sell their products more efficiently, reducing reliance on intermediaries and ensuring fair pricing and real-time supply chain optimization. Precision agriculture techniques, including drones, IoT sensors, automated irrigation and AI-powered analytics, help farmers monitor soil conditions, predict weather patterns and optimize water and fertilizer usage, leading to higher yields and greater sustainability. Additionally, blockchain technology is being used to improve traceability and transparency, providing consumers with detailed product information regarding origin, sustainability practices, and quality assurance (Willemien van Asselt).

Despite these advantages, high investment costs pose a significant challenge, particularly for small-scale farmers who may struggle to afford advanced technologies or

acquire the necessary expertise. However, this also presents an opportunity for the Netherlands to export its agritech expertise to developing countries, where these innovations can enhance food security and improve farming efficiency. Cybersecurity risks, such as hacking and data breaches, threaten the digital infrastructure of agriculture, while climate change and extreme weather conditions pose long-term sustainability concerns. To maintain its leadership in smart farming, the Netherlands must continue investing in technological advancements, cybersecurity measures, and climate-resilient agricultural solutions, ensuring that innovation remains both sustainable and accessible to farmers worldwide.

2. The Chinese Experience: Agricultural E-Commerce via "Alibaba"

China has transformed agricultural marketing through e-commerce platforms, with Alibaba leading the way by providing direct market access for farmers while reducing the influence of intermediaries. This digital approach has significantly improved market efficiency, allowing farmers to sell their products faster and at better prices. A major strength of this model is the strong government support for agricultural digitalization, which has facilitated the expansion of smart logistics, AI-driven market analysis, and big data applications to optimize supply chains and predict consumer demand. Additionally, the integration of automated warehousing, blockchain traceability, and drone deliveries has enhanced efficiency and transparency in agricultural trade. These advancements have not only benefited large-scale agricultural producers but have also increased rural participation in the digital economy, bridging the gap between farmers and urban consumers through livestreaming sales and interactive platforms (group, s.d.).

Despite its advantages, challenges and weaknesses persist. The dominance of large corporations like Alibaba limits competition and restricts smaller e-commerce platforms, making it difficult for independent businesses to thrive. Additionally, many small-scale farmers lack the technical skills needed to maximize the benefits of digital platforms, creating a divide between tech-savvy farmers and those struggling to adapt. However, China has a significant opportunity to expand global agricultural e-commerce, leveraging its expertise in digital payment systems, AI-driven marketing, and cross-border logistics to streamline international trade. Nevertheless, market fluctuations, logistical issues, and challenges in handling perishable goods pose serious threats that could disrupt supply chains and impact profitability. To maintain its leadership in digital agriculture, China must focus on enhancing training programs for farmers, improving competition in the e-commerce sector, and investing in resilient logistics networks to ensure long-term sustainability.

3. The Indian Experience: Mobile Applications Connecting Farmers to Markets

India has rapidly adopted mobile-based agricultural marketing, with platforms like eNAM (Electronic National Agriculture Market) and AgriBazaar revolutionizing the way farmers connect with buyers. These platforms provide direct access to markets, reducing the influence of intermediaries and ensuring better price realization for farmers. A major

strength of this approach is its low-cost accessibility, making digital marketing tools available to even small and marginal farmers who traditionally struggle with high marketing expenses. Additionally, these platforms enhance price transparency, allowing farmers to compare rates across different regions and make informed selling decisions. By leveraging mobile-based technology, Indian farmers can now receive real-time updates on commodity prices, weather forecasts, and best farming practices, helping them optimize crop sales and minimize losses. Moreover, the government's Digital India initiative has further propelled the adoption of agricultural e-commerce, encouraging more farmers to transition from traditional mandis (marketplaces) to digital platforms (Rishi Kumar Singh, 2021).

Despite these advantages, significant challenges remain. A major weakness is insufficient digital infrastructure in rural areas, where internet connectivity, smartphone penetration, and digital literacy are still limited. Many farmers, particularly those in remote villages, lack access to high-speed internet and mobile networks, making it difficult to fully utilize these platforms. Additionally, digital literacy remains a key barrier, as many farmers require training and technical support to navigate online marketplaces efficiently. However, India has opportunities to expand this model by developing multilingual applications that cater to the country's diverse linguistic landscape, ensuring that farmers from different states can comfortably use these platforms. Furthermore, AI-driven market analytics could enhance decision-making by providing predictive insights on crop demand, price fluctuations, and best-selling times. However, trust issues in digital transactions pose a significant threat, as many farmers remain skeptical about online payments, contract enforcement, and fraud prevention. Additionally, large agribusiness corporations are expanding their digital presence, which could overshadow small farmers and make it challenging for them to compete independently. To sustain the growth of mobile-based agricultural marketing, India must invest in rural digital infrastructure, strengthen farmer training programs, and implement robust security measures to build trust in digital transactions and ensure equitable market access for all farmers.

4. The French Experience: Digital Marketplaces for Local Farmers

France has embraced digital marketplaces to empower local farmers by allowing them to sell directly to consumers, reducing dependence on traditional intermediaries. This model supports sustainable and organic farming, aligning with the increasing consumer preference for fresh, locally sourced products. By using online platforms, farmers can promote their goods more effectively, ensuring fair pricing, greater visibility, and direct engagement with customers. Additionally, digital marketplaces enhance transparency, as consumers gain direct access to information about product origins, farming practices, and sustainability efforts. This trust-building aspect strengthens the relationship between farmers and buyers, fostering a more ethical and community-driven food supply chain. Furthermore, subscription-based models and farm-to-table delivery services have gained popularity, providing farmers with predictable revenue streams while offering consumers convenient access to high-quality produce. The French government's support for agricultural digitalization, along with the expansion of high-speed internet in rural areas,

has further accelerated the adoption of this model, making digital marketplaces more accessible to farmers across different regions (Véronique Bellon-Maurel, 2023).

Despite its strengths, this model also presents significant challenges. A major weakness is the complexity of inventory management and logistics, requiring substantial investment in efficient storage, packaging, and last-mile delivery. Many farmers lack the financial resources and technical knowledge to implement automated inventory tracking systems, making it difficult to manage demand fluctuations and maintain consistent supply levels. Additionally, digital marketing expertise is crucial for success in this space, yet many small-scale farmers struggle to navigate SEO, social media advertising, and e-commerce optimization, limiting their ability to reach broader audiences. However, there are major opportunities for growth, particularly with the rising demand for sustainable and organic agricultural products. Advancements in AI-driven smart platforms and data analytics could further optimize direct-to-consumer sales, providing farmers with insights on consumer behavior, demand forecasting, and pricing strategies. Nevertheless, this model faces threats, including shifts in consumer preferences, where trends in food consumption may change unpredictably. Additionally, regulatory challenges in e-commerce and food distribution laws could impose new restrictions on direct online sales, potentially increasing compliance costs and limiting market expansion. To ensure the long-term success of digital marketplaces in agriculture, France must continue investing in digital literacy programs for farmers, strengthen logistics infrastructure, and create regulatory frameworks that support fair and transparent online trade.

The following table presents a simplified SWOT analysis for each international experience, focusing on the potential for applying elements of these models within the Algerian context. This analysis aims to highlight the strengths, weaknesses, opportunities and threats associated with each model while providing a clear vision of how to benefit from these experiences to develop digital agricultural marketing in Algeria in line with local capabilities and existing challenges:

Fig.01. SWOT Analysis for Each Experience and It Application in Algeria

Source: Prepared by the researcher based on previous studies.

Country Experience	Strengths	Weaknesses	Opportunities	Threats	Application in Algeria
Dutch Experience	Advanced precision agriculture (IoT, AI, drones) Efficient supply chains with direct-to-consumer platforms Blockchain for transparency and traceability	High investment and operational costs Technical expertise required for adoption	Export of agritech expertise to developing countries Partnership with Algerian startups and institutions	Cybersecurity vulnerabilities Climate change impacts on agriculture	Pilot smart farms in fertile regions (e.g. Jijel) Government subsidies for precision farming tools Introduce blockchain systems for export crops traceability
Chinese Experience	Strong e-commerce integration (Alibaba) AI-driven market analysis and smart logistics	Monopoly risk from dominant platforms Low digital skills among small-scale farmers	Global expansion of agri-e-commerce Export China's model to North African markets	Perishable goods handling Dependence on logistics networks	Create local digital platforms for farmers Use AI for demand forecasting in local markets Training programs for rural farmers on digital trade
Indian Experience	Low-cost, mobile-based platforms (eNAM, AgriBazaar) Government support for rural digitization	Weak rural digital infrastructure Low digital literacy among farmers	Multilingual apps for rural inclusivity AI-based market prediction tools	Fraud and trust issues in digital transactions Dominance of large agri-corporations	Launch mobile agri-market apps in Arabic and Tamazight Support low-cost mobile infrastructure in rural Algeria Promote trust in e-commerce via farmer cooperatives
French Experience	Promotion of local, organic farming via digital platforms Subscription models for revenue stability	Logistics and inventory management challenges Need for digital marketing skills	Rising demand for sustainable products Use of AI for customer insights and pricing	Regulatory barriers in online food trade Unpredictable shifts in consumer behavior	Build local digital markets for organic Algerian produce Enable direct-to-consumer apps in urban centers Provide SEO and digital sales training to Algerian farmers

Conclusion:

The study highlights the transformative impact of digital innovation on agricultural marketing, emphasizing how countries like the Netherlands, China, India and France have successfully integrated technology to enhance efficiency, reduce intermediaries and improve direct market access for farmers. The adoption of digital platforms, AI-driven analytics, blockchain for supply chain transparency and mobile-based applications has significantly improved agricultural marketing outcomes. However, these experiences also underline key challenges, including high investment costs, digital literacy gaps and logistical complexities.

For Algeria, leveraging these global experiences can enhance its agricultural marketing sector and contribute to food security and economic growth. To achieve this, the following recommendations should be considered:

- 1. Strengthening Digital Infrastructure:** Expanding internet coverage and improving mobile network accessibility in rural areas will enable farmers to participate in digital marketing platforms effectively.
- 2. Government Support and Policy Development:** Implementing policies that encourage investment in agricultural digitalization, including subsidies for smart farming technologies and incentives for agritech startups, can foster innovation.
- 3. Farmer Training and Digital Literacy Programs:** Organizing training programs to educate farmers on the use of digital marketing tools, e-commerce platforms, and blockchain traceability will help bridge the technology adoption gap.
- 4. Developing Local E-Commerce Platforms:** Establishing national agricultural e-marketplaces, similar to China's Alibaba model or India's eNAM, can facilitate direct farmer-to-consumer sales, ensuring fair pricing and reducing dependence on intermediaries.
- 5. Investing in Smart Logistics and Cold Chain Management:** Enhancing transportation networks and storage facilities will improve the efficiency of supply chains, ensuring product quality and reducing post-harvest losses.
- 6. Encouraging Sustainable Agricultural Practices:** Promoting organic and sustainable farming techniques can help Algerian products gain competitive advantages in both local and international markets.

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