

Web-Based Agricultural Management Products for Marketing System: Survey

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ABSTRACT

The development of information systems motivated scientists to use their knowledge to improve new tactics that can provide competitive advantages in a highly complex environment, primarily in the management of agricultural products marketing systems. Farmers often blame marketing issues for their struggles. Poor prices, a lack of transportation, and substantial post-harvest losses are all issues that they can recognize, but they are typically ill-equipped to solve. Modern technology, particularly Internet and mobile connectivity, makes it easier for people to do their work across a wide range of activities, including economics, commerce, marketing, and agriculture. Agricultural Information Management Systems (AIMS) are becoming more popular as a useful sector as agriculture expands and becomes one of the world's most lucrative enterprises. In recent years, people have become increasingly dependent on this technology. Systems have evolved from passively absorbing information to actively incorporating users as an important part of the system. The goal of this research is to clarify and exhibit that different kind of systems employed by various agricultural-related authorities had a good probable influence on their operations by making duties simpler for their personnel. Specifically, the study focuses on displaying this information. In addition, the research analyzes the primary distinctions between these studies by contrasting many of them, with the goal of gaining an understanding of the foundational advantages that may be used by new researchers that are interested in developing new AIMS, And in order to fully comprehend websites, researchers are combining quantitative and qualitative approaches. Numerous analyses of agricultural product websites have been conducted, using a wide range of approaches. Study 26 investigated whether farmers' and retailers' use of web-based technology facilitated the display and sale of goods.

KEYWORDS: Agricultural Products, Marketing System, E-Commerce, E- Marketing, Agricultural Marketing.

1. Introduction

Decisions making about the production and sale of farm commodities, farmers rely heavily on agricultural market information systems. Farmers need to be able to get full, accurate, and up-to-date market information for their crops quickly and easily [1]. Agricultural marketing plays an important role in the national economy because it is the foundation on which agriculture is built; the farmer seeks to market his crop and deliver it to the consumer. As a result of agricultural development and increased specialization in production, as well as trade openness to other countries, the benefit to the producer and consumer has increased [2]. To show the value of agricultural products marketing centers, because they represent one of the most important elements in which benefit exchange occurs. In those marketing centers, agricultural products are bought and sold, and this process occurs primarily in one location, which is the market. Many markets specializing in the marketing of agricultural products have emerged, including fruit markets, vegetable markets, and livestock markets that sell and sell fish, as those markets have grown to meet the needs of the population for agricultural commodities, and as these markets have become the primary focus of interaction between supply and demand forces. It is no secret to us that agricultural product marketing centers play an important role in the development process, as they work to mobilize capital and human energies in the field of competition with developed countries'

markets, which helps those countries improve their food and economic security. As a result, the evaluation of agricultural products marketing centers is important.

It seems vital to integrate the role of information technology in agricultural production in order to help overcome the problem of diminishing agricultural production. "Smart farming" refers to the practice of integrating technology into agricultural practices. Smart farming technology will control and monitor the entire agricultural process, through planting to harvest, with the intention of making it more productive.

The web is one of the technologies that is presently developing at a rapid pace. The web allows for the efficient and effective transmission of data and information, as well as the loading and displaying of a wide variety of information that can be accessed from a wide variety of devices. The proliferation of smartphone technology has contributed to people's growing reliance on mobile devices. Smartphone users' reliance is inextricable from the advancement of the device's useful features. Apps that make better use of smartphones and their features are being developed in tandem with the devices themselves.

It's starting to pick up steam in terms of development of a technology that enables applications on smartphones, particularly smartphones using the Android operating system, from a solo program to an application that can communicate with other applications over a worldwide network. Web service application programming interface (API) refers to the technology that allows computers and mobile devices to communicate and share resources. [3] Due to agricultural issues and the progress of technology, it is important to build a web-based information system to store and record all data collected from seed sowing through crop harvesting. An application programming interface has been built into the system as well, so that it can be used with other programs.

The rest of the paper is organized as follows; an examination of the relevant literature in Section II, followed by An overview of the methodology will be provided in Section III, and finally, a discussion and results will be provided in Section IV. Section V presents the conclusion.

2. LITERATURE REVIEW

Modern information technology's widespread adoption has given agricultural businesses new opportunities for growth within a dynamic and competitive market and for locating new customers. When it comes to reselling goods online, one of the most basic technological elements is undoubtedly e-commerce [4]. Poor living conditions for farmers have been a result of the involvement of middlemen since the beginning of time. Construction of a portal will allow farmers to reach customers all around the country with their wares. The website makes it simpler for farmers to sign up and start selling their goods. Since the web site creates a direct link to the consumers, the farmers stand to gain more than usual from its use. Taking out the middlemen and streamlining the process. Through the portal, farmers can have a better understanding of sales, profits, and consumer wants and needs. As a result, the farmer would have a better notion of what crops to cultivate and how much money to put into them based on what their customers want. The max-priority algorithm allows the most profitable customers to be assigned to the farmers. It also aids farmers in getting their goods to market faster. That's why this platform is so important; it helps farmers make more money, which boosts the economy [5].

In 2022, Sanjay S. Kadam et al [6], It presented a new way to increase farmers' profitability via direct farmer-to-farmer, farmer-to-customer, and farmer-to-dealer contact. The project helps farmers sell items online at the best price. Farmers, consumers, dealers, and admins utilize this website. Farmers will have a unique interface to the market, acquire market prices,

communicate through SMS or email, learn about various schemes, and be paid online. It gives farmers interactive market and commodity reports. The centralized market committee controls every business.

Condro Puspo Nugroho 2021 [7], Farmer's knowledge and expertise in utilizing IT, as well as the influence it has on their income, revenue, and selling price were examined in this study. It was decided to conduct the study in East Java's Malang Regency and Batu City, which are hotbeds for horticulture output. Farmers who utilize e-commerce and those who don't were separated into two groups (conventional farmers). According to the findings, farmers who utilized e-commerce had more income, higher revenue, and a better selling price than those who didn't, and the difference was statistically significant.

Nina, Rachman, & Surahman (2020) [8], Agriculture System Powered by Artificial Intelligence (E-Tandur). In this research, we explore how an IoT-based agricultural information system might be utilized to improve the consistency of the quality of food grown in the field. Incorporating information technology into farming will improve crop yields, hardiness, and efficiency in crop production costs.

Saputri & Mulyono (2019) [9], A Web-Based Harvest Data Reporting Management Information System: Analysis and Design for Jambi Province's Food Crops Agriculture Service. When complete, the information system will facilitate everything from data logging and retrieval to the creation of reports. Therefore, the developed information system will greatly aid in providing data that facilitates decision making.

Aprini (2019) [10], Planning a City of Pagar Alam Internet Agriculture Sales and Marketing Database. The purpose of this research was to develop a system for promoting and informing the public about agricultural goods in Pagar Alam City in a timely, precise, and accurate manner. In order to increase the visibility of Pagar Alam City's agricultural products

to potential buyers who may not be located inside the city itself or the immediate surrounding area.

Rahayu, Cahyana, & Cahyana (2019) [11], A unified strategy for the design of a web-based agriculture products information system. The original intent of this database was to streamline the process by which farmers could give their customers direct product information.

Elmayati & Hazilawati (2019) [12], An SMS Gateway-Based Information System for the Extension of Agricultural Products in Musi Rawas District, Pakistan. To help farmers in the Musi Rawas area better understand agricultural practices, commodity pricing, and other challenges, the SMS Gateway technology may be used. Agricultural extension efforts will also be made more accessible and will be able to reach more rural regions as a result of these improvements.

Perkasa & Setiawan (2018) [13], Development of Web Services for Local Data Using an Access Token with a REST API. Data from the Population and Civil Registry Service is used to construct and register job seeker cards in this study's application. Several parties, including data administrators, employees, and individuals, may benefit from this application's ability to perform and facilitate various functions.

Setiawan, Eosina, Primasari, & Ridwan (2018) [14], Software for Managing Medicinal Plant Resources (SITANO). In order to streamline the use of medicinal plants in this study, a web-based information system was created. In-depth information on nursery operations, plant maintenance, administrative and financial reporting, and more can be found in the onsite database. The development of a medicinal plant information system has been proved to improve the efficiency and effectiveness of maintaining medicinal plants.

Herbal medicine information system [15]. This information system provides details about herbal medical plants, the compounds they contain, their

characteristics, and the processes that may be utilized to turn them into herbal medicinal plants. The purpose of the information system created is to make it easier for the general public to find information about herbal medicine.

In 2015, A. Satheesh et al [16]. farmers will be able to cultivate their crops in a cloud-based e-commerce environment that facilitates their delivery of agricultural goods to the market place on time and provides them with the most up-to-date farming technologies. Farmers would be able to get their produce to market more quickly in this scenario. The Minimum Support Price (MSP) Policy is intended to establish a floor price for the sale of perishable agricultural goods.

In 2005, Vikram Sorathia et al [17]. In their proposal, they laid out a model act that describes business logic precisely and that will be adopted by all marketplaces across the country. They modeled distinct business procedures as Web Services, and then developed an orchestration service that can execute the entire procedure, even if it involves many systems and people.

In 2022, Anadozie et al. [18] The effect of cell phone use on poor rural farmers was evaluated using an interpretive method. Using the Sustainable Livelihoods Approach, interviews with farmers in a rural Nigerian agrarian community revealed that mobile phone use had a positive effect on farmers' ability to communicate with one another, connect with neighbors, and gain knowledge and expertise in agriculture (SLA). Opportunities like these enhance the lives of farmers across the board in the agriculture industry. Farmers are unable to fully reap the benefits of mobile technology due to human capital deficiencies and contextual factors such as language barriers and a lack of ability and understanding in using mobile phone features and functions. This demands for strategies to develop rural capabilities and raise knowledge of cell phone farming.

In 2021, Anadozie et al. [19] They developed a qualitative system dynamics model that portrayed cell phone use in agriculture. According to the principal feedback loops, the greatest challenges to farming in the area are insecurity and climate change. Farmers, on the other hand, gain from mobile phones' enhanced access to information and communication, which empowers them and enables them to overcome these hazards. The use of feedback loops in research adds rigor and depth to the results due to their ability to emphasize the interdependencies between system components. Using system dynamics modeling, they learn more about how the use of mobile phones in agriculture affects knowledge and practice.

In 2021, Dewi et al. [20] studied how and why the establishment of an agricultural product information system, which aimed to assist the region's best product-based economy. Other Bali regions and Indonesian provinces may benefit from this strategy as well. Using this strategy, farmers will be paid fairly for their products, and shoppers will be able to purchase high-quality commodities at low rates.

In 2021, Ibrahim et al. [21] They explain the design and implementation of a blockchain-based poultry information management system utilizing Hyperledger Fabric. The proposed system provides precise, decentralized, immutable, and consensus-based processes that foster trust and openness among stakeholders. The primary functions of the system are the recording of information linked with chicken growing (from a hatchery to a farm) and the monthly reporting of farm operations. The system can monitor the movement of docks across the supply chain till final customer delivery at the retail store. The capacity to track the origin of animal products through all phases of rearing/production, processing, and distribution is crucial for guaranteeing food safety since recalling tainted products is simple, boosting customer trust.

In 2021, Sivalakshmi P et al. [22] All of the problems

in this agro-sector, they said, may be solved by connecting farmers and distributors directly through an efficient auction system, allowing for immediate payment upon delivery and full disclosure of all financial dealings. Governments could serve as a hub for coordinating technical details, educational programs, and regulatory frameworks that will aid recently graduated individuals in the labor market.

In 2021, Krishna et al. [23] They suggested software would allow farmers to sell directly to clients. The mobile app benefits both farmers and users. The technology claims to make selling things easier. A user may navigate to the farmer depending on the farmer's location. The app is farmer-friendly. The user sees all the farmer-uploaded goods. The user may browse to the farmer's location to purchase the produce. This software lets users purchase things.

In 2021, Anbumani et al. [24] was conducted New approach for agricultural automation Agriculture's Cloud-Based Marketing System. Internet communication is the answer. The initiative improves information flow between farmers and customers by eliminating middlemen. By implementing the idea, farmer and buyer gain without middlemen and supply delays are avoided. It also prevents middlemen from raising product prices needlessly, against regulatory rules.

In 2021, Leduc et al. [25] They pointed out that most blockchain-based farming frameworks today are geared toward tracking and tracing food. Rarely does research focus on how to design digital marketplaces to help farmers and other potentially interested third parties trade agricultural goods, and the same is true for evaluating how well the proposed frameworks work.

In 2020, Umar et al. [26] Studied how numerous studies have shown that a well-designed marketing information system may help businesses make better decisions more quickly and easily. In order to gain a competitive edge, it may be utilized to supplement or

even replace costly assets that are already available in the market. Agricultural marketers and consumers alike would benefit from the proposed system's improved reliability and efficiency as a way of conducting agricultural transactions when selling their products.

In 2020, Shamrat et al.[27] They create "Smart Farming System" online app. Through this mechanism, Bangladeshi farmers may exchange expertise and problems. Farmers may research illnesses and find solutions. "Smart Farming System" experts and physicians may aid with agricultural operations.

In 2020, Vilas et al. [28] Studied how the 1622WQ app provides farmers with real-time information on nitrate and other factors in local creeks and rivers. The design approach highlighted application constraints such as inadequate internet access, low data quality, and operational difficulties. Once these impediments were removed, adoption increased. Real-time information for farmers is just part of the answer owing to a digital gap between conventional and digital sectors.

In 2020, Vikas et al. [29] It was presented by them how method will be built on an auction, with all wholesalers and merchants bidding from a set minimum value for the commodity that a specific farmer posts online. The items will be sold to the highest bidder / wholesaler. A confirmation email will be sent to both the farmer and the merchant, together with their respective contact information, after the auction is over. Once the farmer and the merchant/wholesaler have exchanged contact information, the logistics of transporting the goods will be explored.

In 2020, Wibowo et al. [30] Show how farmers can use a smartphone app to help them sell their agricultural goods more easily. One of the difficulties in designing mobile apps is the wide range of mobile device platforms available. In an ideal world, a single

mobile app would be able to function on many platforms. This study contributes to the creation of an application for Android and iOS platforms utilizing a hybrid strategy for application development.

In 2020, Rachmaniah et al. [31] They used gRPC and GraphQL were used as servers in the study, while front-end apps built on the Vue Js framework were also developed successfully. Extreme programming techniques with two iterations are used in application development. A project velocity of 37 allowed for the successful implementation of eight user stories in iteration one. Eleven user stories were completed in the second iteration with a project velocity of 41. With a shorter supply chain, the government hopes that the Tokocabai marketplace application would help to stabilize chili prices.

In 2019, Salahuddin et al. [32] They did behavior and robustness of the agricultural online application were assessed after it was tested using black box and white box techniques. Accuracy was found to be 93.4 percent for agricultural web-based applications in the study. There have been no issues with the web-based agricultural management development application working well to map out the area of North Aceh's superior agricultural products and viable agricultural places.

In 2019, Bhutta et al. [33] They sought to examine and assess the literature on Agriculture Market Information System produced between 1995 and 2018 to demonstrate the value of market information, particularly in developing countries, and its influence on various stakeholders. Agriculture Market Information system, its components, working, economic utility of information for its different stakeholders like growers, policy makers, and market functionaries and the challenges like cost involved, the validity of data, accuracy, and problems in its disseminations are discussed in this article.

In 2019, Dormido et al. [34] They launched a smartphone app for agriculture in Negros Occidental,

Philippines. This smartphone software helps farmers make decisions about in-demand agricultural products. An agricultural product forecasting system that helps farmers sell their goods without losing quality or wasting harvests. The program helps track trading post prices. This helps dealers ensure customer supply.

In 2019, Chinnusamy et al. [35] They creation of a website. It includes all of the information on the farmers' agricultural output. By placing an order and providing a delivery address, the client may purchase it straight from the farmer. If the client and the farmer are near enough, the product may be delivered directly; otherwise, logistics are required. In this manner, both the farmer and the consumer may get payment in full for the labor they performed. The website makes this kind of electronic transaction incredibly efficient and beneficial for both consumers and farmers.

In 2019, Amer et al. [36] Explain the purpose of the study was to map the existing agricultural marketing information systems, evaluate the challenges that farmers face in their access and use of these systems, and propose improvements to guide the development of robust agricultural marketing information systems that are easy to use and accessible. They also underline the need of government assistance in the development of technical and information and communications technology (ICT) infrastructure as the basis for contemporary information and marketing systems based on ICT. Due to the low extension worker farmer ratio, the traditional technique of dissemination, which calls for direct interaction between extension workers and farmers, is presently inapplicable.

In 2018, Akbar et al. [37] Studied how the administration, manufacturing, and marketing modules comprise the create Gapoktan management software. In consideration of the great distance between farmer groups, a web-based application for

activity management that may be used online by farmer groups. It is anticipated that this application would serve as the foundation for the administration of information technology-based farmer groups and the beginning of the creation of communication networks between the salak farmer groups integrated into the Gapoktan of Ngudi Luhur.

In 2018, Bhende et al. [38] Elucidate get a decent price, farmers must understand the market's thriving crops and items. Reaching all merchants physically would take too much time and effort, and farmers have limited time. Traditionally, farmer methods restricted access to clients (merchants), limiting alternatives for selling agricultural products. Introducing a new marketing approach where farmers may sell their crop or product at each step of the marketing chain (merchants, marketplaces, or directly to end users) with many possibilities is important. Android apps for farmers are utilized.

In 2018, Nugroho et al. [39] Android Marketplace Agricultural Product Base Application suggested This application was created using the Software Development Life Cycle (SDLC) Prototype methodology, Java, XML, and MySQL as the database management system. This application will provide information on agricultural goods, make it easier for farmers to advertise those items, and make it easier for farmers to engage in direct business with customers.

In 2018, Evans et al. [40] The researchers used a system generalized technique of moments to investigate the non-linear connection that exists between mobile phones, internet, and agricultural growth in Africa during the course of the period 2001-2015. The empirical findings point to a link that is not linear between mobile phones, internet access, and the progression of agricultural practices. Both the rate of mobile penetration and the squared rate of mobile penetration have significantly favorable impacts on agricultural value added, which suggests that the rate

of mobile penetration has a rising influence on agricultural value added. On the other hand, although using the internet may have major negative consequences on the value contributed to agricultural products, using the internet squared can have huge beneficial benefits. Mobile phones and the internet play key roles in the spread of agriculture, and agriculture in turn plays essential roles in the extension of mobile phones and the internet.

In 2018, T.Salvador et al. [41] The study aimed to help small-holder farmers, farmer cooperatives, and farmer groups adopt Agro-Entrepreneurship and connect to institutional markets. This data management software will help farmers and their executives manage farmer and product information and monitor clustering-related data. Provisions for the Production Module and Financial Module enable farmers to manage agricultural data systematically. This will provide farmers access to a well-managed information management solution to enable them better manage their product and agricultural operations. Access to agricultural data reports will make farmers more efficient. With this management tool, farmers, leaders, and organizations may improve conventional agricultural documentation procedures.

In 2018, Mambile et al. [42] point to most livestock producers now have inexpensive cellphones. Despite its promise, livestock producers have limited access to and use of livestock information systems. Tanzania's poultry industry has financial potential, but producers lack dependable market linkage information systems to reach customers. Poultry producers face similar technical challenges. This project aimed to construct a web-based platform for poultry market linkage with an emphasis on usability and user experience (UX). The web-based platform's user experience was tested using eye tracking, retrospective thinking aloud, and facial expression.

In 2017, Mutiawani et al. [43] point to unprocessed,

tradeable materials are commodities. Price is crucial in commodity trading and may determine buying and selling. Aceh province trades agricultural goods. Agricultural market information system collects, processes, and distributes pricing data. KomoditiAceh is a web-based agricultural commodities pricing information system for Aceh. KomoditiAceh may be accessed with a web browser. Smartphone displays aren't great. Using RESTful Web service, this study created an Android version of KomoditiAceh.

3. METHODOLOGY

In particular, data on published articles was gathered via academic search engines—tools that many scholars often utilize. Agricultural Products, Marketing System, Online Agricultural Marketing, Web-Based Agricultural Marketing, Database Agricultural Marketing, Digital Agricultural Marketing, Mobile Application, and other phrases were used in the search. In addition, attempts were made to locate references that have been cited in previously published publications. After carefully examining the papers, it was found that there are published studies that have a direct bearing on the subject of website evaluation in the agriculture sector. There are a total of 26 peer-reviewed articles that are connected to this investigation. As stated in Table 1, the publications were separated into several categories. which included the problem-specific study, the research's objective, its methodology, its findings and suggestions, the location, and the agricultural goods covered by the research's area of interest.

Prior research indicated that the most prevalent target category is Web-Based, which employs a variety of methods, and destination websites were the second most popular category. However, mobile applications on the phone were the most requested in terms of popularity, as the majority of farmers do not use laptops or desktop computers due to the fact that they

conduct the majority of their business on Etisalat and that the mobile phone enables quick communication over the Internet. People will search for news to satisfy their requirements since news is vital for educating the general public on a variety of subjects. Different media provide information that influences audiences' choices and aids in problem-solving. In this era of enhanced information exchange, mobile phones are crucial communication tools. However, as technology develops, the usage and influence of these gadgets are sometimes both overstated and undervalued. Information is essential to agricultural growth because it facilitates communication among stakeholders, acts as a way to identify trends, and helps to direct decision-making. [44].

The practice of farming calls for information and the application of technical knowledge, which is why extension services are required. However, owing to a variety of issues, extension services are not easily accessible to all farmers. The integration of mobile technology with agricultural practices in this way enables nations to more rapidly advance their economies. In addition to this, it investigates the ways in which information and communication technologies are altering the agricultural environment in different nations. It further highlights the significance of agricultural market information in the agriculture value chain, as well as the issues that it faces, as well as the experiences that smallholder farmers have had. [45].

3.1 Electronic Commerce (E-Commerce).

When firms started conducting a larger amount of their typical buyer-seller operating operations online in the late 1970s, this is when Electronic Commerce (E-Commerce) first emerged [46]. The organizations have made a significant shift toward inter-organizational systems (IOS) and internet-based e-commerce applications over the past few years of challenges using electronic data interchange (EDI), which has the potential to have significant benefits

but is typically difficult to implement in real life. Through internet applications, EDI, which used to be cost-effective, is now accessible to all enterprises. Building confidence among trade partners in a worldwide virtual environment is essential given the exponential increase predicted for business-to-business (B2B) e-commerce. Digital marketing, virtual money transfers, supply chain, online marketing, online transaction processing, electronic data exchange (EDI), inventory management systems, and automated data gathering systems are just a few of the technologies that are employed in e-commerce. There are six primary types of electronic commerce: business-to-business (B2B), business-to-consumer (B2C), business-to-government (B2G), consumer-to-consumer (C2C), and government-to-business (G2B)[47]. Popular E-Commerce market statistics place Amazon, which was developed in the US, among the leading E-Commerce platforms internationally. While Amazon and eBay dominate the business-to-consumer (B2C) e-commerce space, Rakuten and Alibaba are making steady inroads in this sector. The most well-known example of C2C E-Commerce is the online auction site eBay, which also allows merchants a platform to advertise their items. Customers can shop directly from their home computers or mobile devices via e-commerce websites, which process outsider B2C and B2B purchases and sales. The online marketplaces, which process outsider B2C and B2B transactions, collect demographic information through web contact and web-based media, electronic information interchange, and marketing to both potential customers as well as established ones via web media stages. Electronic commerce is the use of Information and Communication Technologies (ICT) to support all aspects of a company's operations. As a company, you can't do business without commerce, which is the exchange of goods and services between businesses, organizations, and individuals. The term "Electronic

Commerce" refers to the practice of doing commerce between companies and their customers, suppliers, and other organizations through electronic means. E-commerce may be defined as the process of doing business through the internet. It necessitates not only the integration of ICT into a company's internal operations, but also the increasing interoperability and cooperation across the IT infrastructures of all parties involved. Some widely acknowledged technologies and technical standards have permitted the broad use of ICT in many different fields throughout the world. The business process should be the focus of your attention. As well as a commercial process, it also provides a complete process that spans many organizations and transcends organizational boundaries. When ICT was first developed, its primary purpose was to automate business activities inside a firm; now, it automates the whole process that passes across all involved businesses. In short, M-Commerce is the usage of mobile devices for commercial purposes, such as smartphones and cell phones. It is described as (mobile) consumers' location independence, availability of services through well-established mobile phone networks, increased processing capabilities of mobile devices and interaction with mobile devices. In m-commerce, clients' geographical independence, high availability of services over existing mobile phone networks, rising computational power of mobile devices, interactivity of smartphones and security are some of the primary advantages of the technology [48].

3.2 Agricultural Marketing.

A set of economic operations known as marketing are done to increase or develop a product's economic worth. The connection between production and consuming activities is provided by marketing activities. The definitions of marketing given by different professionals may vary from one another. The definitions of marketing employed by

professionals vary, which is what causes the discrepancy. The exchange activities are the main focus of this marketing campaign. By demonstrating their values to diverse social groups in order to suit their wants, people engage in exchange, a kind of commercial activity, where they attempt to provide a variety of products or services. The goal of marketing as a human activity is to fulfill wants and desires via the process of trade.

According to Philip Kotler, marketing is a social and management process wherein people and groups create, sell, and exchange valued items with one another in order to fulfill their needs and desires. The basis for this definition of marketing is a fundamental idea that encompasses needs, desires, and requests [49].

In order to obtain the desired results, businesses must use marketing principles effectively in their daily operations. This suggests that a company's marketing operations need to be better integrated and controlled. Consumers' interests and demands are at the heart of the marketing idea. This business theory asserts that a company's sustainability is dependent on meeting the requirements of its customers, which is why the term "marketing idea" is used [50].

As a result of the preceding description, all corporate actions must be geared toward understanding the demands of customers and providing satisfaction in order to achieve long-term profitability. Marketing organizations are the corporate entities that apply this marketing strategy. To achieve organizational objectives, it's essential to be more successful than your rivals in integrating marketing operations into your overall strategy. In this marketing strategy, the target market, customer demands, integrated marketing, and profitability are the four pillars of success. As society and technology continue to grow, the notion of marketing is evolving to reflect these changes. Societies and people are no longer only the focus of businesses. The term for such an idea is

"community marketing" [51].

3.3 Web-Based System.

So far, computer technology has advanced considerably as a result of the digitization process. Improvements in speed, error-free performance, and security are among the features that have been included. The development of the internet and extranet has had a major influence on the way markets operate in business and marketing. With the internet and the outside world easily accessible, consumers are dealing with numbers from across the globe. All of this is possible thanks to web-based tools.

An application or service that is available through an internet browser and can be accessed from anywhere in the globe falls within the definition of a web-based system. When computers are connected to one another, they share information and data in order to attain a high level of performance via distributed systems[52].

Databases, commerce, marketing applications, and information systems are all using this technology. The ways in which these aspects of the global system may be put to use will differ from one organization to the next. Those make it easier for the general people to use the available systems. If the specifics of a system's operation to be altered, it may take a considerable amount of time to do it [53].

4. DISCUSSION AND RESULTS

When it comes to Customers, suppliers, and academic researchers' perspectives on agricultural-related websites, such as those that give product information, were typically surveyed using qualitative methods in the early phases of this study. To put it another way, the results drawn from these early studies cannot be generalized since there were only a limited number of participants. Furthermore, the researcher's limited knowledge of online purchasing may be enhanced by including academics in the process, which may assist

ensure a high level of trust in the instruments utilized. Customers and practitioners are increasingly influencing the usage of quantitative approaches in website evaluation research. Even while generalizability of results is still a subject of concern in the profession, quantitative research findings seem to be more applicable to a larger market segment than qualitative research findings as illustrate in Table 1.

Table 1. Summary of literature review related to agricultural Web-Based Systems

Reference , author, year	Descriptions	
2022, Anadozie et al.[18]	Technology	Mobile phones
	problem	Some human capital limitations and contextual issues, such as a language barrier, lack of understanding of mobile phone agricultural functions, and inability to utilize mobile phone features, prevent farmers from maximizing mobile phone benefits. There is a demand for indigenous mobile farming apps.
	Aim	These help farmers and ensure long-term food security. Mobile communications ease improves community and creates social capital. Mobile phones improve farmers' knowledge and abilities for 21st-century agriculture.
	Methodology	The interview and field notes.
	Analysis and findings	The results showed that farmers have more possibilities as a result of using mobile phones, and this effect is seen across the whole value chain of agriculture.
	Recommendations	Future studies should employ a longitudinal strategy that includes different agricultural villages, including livestock and fish farms.
	product	Crop production.
2021, Anadozie et al.[19]	Region	A rural Nigerian.
	Technology	Mobile phones
	problem	Insecurity and weather fluctuations threaten agricultural in the area.
	Aim	Mobile phones boost farmers' access to information and communications, empowering them to tackle these dangers.
	Methodology	Data were qualitatively obtained through interviews and field observations.
	Recommendations	Comparative research on other aspects of farming, such as fishing and cattle production, is recommended.
	product	Crop production
2021, Dewi et al.[20]	Region	Northeast Nigeria
	Technology	Web-based
	problem	The problem of high prices for products.
	Aim	Supported the region's product-based economy. This method may help other Bali areas and Indonesian provinces.
2021, Ibrahim et al.[21]	product	Products information.
	Region	Indonesia
	Technology	Blockchain-based
	problem	Stakeholders trust the technology's accurate, decentralized, immutable, and consensus process, which permits straightforward identification of contamination sources in the event that a product is recalled.
2021, Sivalakshmi P et al.[22]	product	Livestock
	Region	Korea
2021, Krishna et al.[23]	Technology	Blockchain
	problem	They suggest a suitable auction flow model to handle all of the observed challenges in the agriculture business.
	Aim	They propose, by allowing farmers direct access to suppliers via an appropriate auction system with the option of quick payment on delivery and clear transaction information, the answer may be provided by enhancing supply chain transparency.
	product	Auction of agricultural products
2021, Anbumani et al.[24]	Technology	Mobile
	problem	Farmers are facing a lot of difficulties in selling their crops in markets. In markets, dalaaries buy crops from farmers for a very small amount of money, causing farmers to lose their crops and profits. Farmers don't know how to sell their crops directly to the end-users.
	Aim	Farmers and other end users are the targeted beneficiaries of the mobile application. The system is designed to make it simple for people to sell their items for fun. The position of the farmer has a significant impact on the user's ability to locate the farmer.
	product	Products
2021, Leduc et al.[25]	Region	India
	Technology	Cloud-Based
	problem	Most distribution networks today face several obstacles, such as the need to serve as profit-maximizing middlemen between producers and consumers.
	Aim	By enabling direct connection between farmers and buyers without the need of middlemen, the initiative improves the flow of information between farmers and their customers.
2020, Umar et al.[26]	product	Farming products
	Region	India
	Technology	Blockchain
	problem	Blockchain technology in farming is attracting interest for its potential to change the centralized, monopolistic agricultural value chain.
2021, Leduc et al.[25]	Aim	Presenting not only an innovative platform for a farming marketplace that is powered by blockchain technology and given the name "FarMarketplace," but also a comprehensive method to assist software solution integrators in better understanding and measuring how a particular configuration setting of such a platform can influence the overall quality of service performance over the course of time.
	Methodology	literature review
	Analysis and findings	It should spur an opposition to the centralized, monopolistic approach that governs the current food value chain.
	product	Farming marketplaces.
2020, Umar et al.[26]	Region	European
	Technology	Web-based
2021, Sivalakshmi P et al.[22]	problem	Same-product costs aren't transparent. Farm products are not advertised to the general public in a formal fashion. Customers can't get real-time information on farm food availability. Poor market knowledge damages and devalues perishables.
	Aim	The suggested approach will work as a more trustworthy and efficient way to carry out agricultural transactions when marketing goods to clients. such that both agricultural

		merchants and consumers can easily access them.			
	Methodology	Market survey.			
	Recommendations	Identify hazards at every level of Market Information operations and determine how to mitigate them. controlled. Developing plans, policies, and procedures that adhere to environmental rules and legislation. in order to sweeten the system. As a means of ensuring optimal resource usage, information on the availability of certain agricultural commodities must be readily accessible at all times. minimizing the possibility of product damage.			
	Region	Nigeria			
	Technology	Web Based			
	problem	Farmers can acquire information around various diseases and resolver on their problems.			
2020, Shamrat et al.[27]	Aim	Through this mechanism, Bangladeshi farmers may exchange expertise and problems. Farmers may research illnesses and find solutions. "Smart Farming System" experts and physicians may aid with agricultural operations.			
	Recommendations	The System may be modified in the future if necessary with a passing scope.			
	Region	Bangladesh			
	Technology	Web-based			
	problem	Because they degrade water quality, intensive agricultural activities pose a serious danger to aquatic ecosystems.			
2020, Vilas et al.[28]	Aim	Farmers may help improve water quality by better agricultural management, but only if they are aware of their role in the decline. While water quality monitoring devices have the potential to raise farmers' awareness, most were designed to analyze regulatory water quality objectives rather than provide information to them.			
	Region	Australia			
	Technology	Web-based			
2020, Vikas et al.[29]	problem	It gets rid of the overall annoyance that an auction situation would bring about.			
	Aim	All wholesalers and merchants will bid on a farmer's online-posted produce starting at a set minimum price. It enables farmers meet customers directly, eliminating intermediaries. Buyers and sellers may discuss items in a forum.			
	Region	India			
	Technology	Mobile-based			
	problem	Problems include an inadequate e-commerce infrastructure, farmers' ignorance of the advantages of e-commerce, and a difficult-to-use program design.			
2020, Wibowo et al.[30]	Aim	The app displays farmers' crops. This app's filter helps discover agricultural items. The app uses Flutter to utilize the same code on several mobile operating systems. Android and iOS outputs vary somewhat. Similarity is 90%, despite some slight deviations.			
	product	This article uses a hybrid strategy for Android and IOS app development.			
	Region	Yogyakarta			
	Technology	Web			
	problem	By developing a digital marketplace for purchasing and selling chili, the issue of price swings might be lessened.			
2020, Rachmaniah et al.[31]	Aim	Digital markets may speed up chili transactions in Indonesia, shortening the supply chain. The Tokocabai marketplace app should help eliminate chili price swings by shortening the distribution path.			
	Recommendations	Application transactions may be possible to			
	ions				utilize a genuine payment gateway in the future if more research is done. As part of future investigations, it is envisaged that both vendors and purchasers will be able to access and use the program fully.
	product				Chili
	Region				Indonesia
	Technology				Web-based Application
2019, Salahuddin et al.[32]	problem				Web-based apps and testing of agricultural applications will be used to map superior agricultural commodities and areas that have the potential to grow agricultural commodities in North Aceh.
	product				Long beans, nutmeg, lime, mango, peanuts, and candlenuts.
	Region				Indonesia
	Technology				Marketing information
	problem				Addresses issues such as the cost of data, its validity, correctness, and difficulties with its transmission..
2019, Bhutta et al.[33]	Aim				Agriculture Market Information System helps growers improve their negotiating strength and market prospects by providing fast, accurate market information. Traders/market functionaries benefit by knowing the current pricing of agricultural commodities and sale/purchase patterns. By enhancing data quality, interpretation, distribution, comprehension, and execution, policymakers may boost value chain stakeholder benefits.
	Methodology				Review of literature findings.
	Region				Pakistan.
	Technology				Mobile App
	problem				Because of the huge importation of commodities from neighboring Asian nations, local farmers are struggling to make a profit. The majority of farmers fall into the "marginal" category of the community, and they are often overlooked by the government when it comes to funding.
2019, Dormido et al.[34]	Aim				Agricultural Technology of Negros Occidental (AgriTechNo), an agricultural product forecasting system application, helps farmers decide where to sell their product and estimate the market's pricing worth.
	product				products
	Region				Philippines
	Technology				Web pages
	problem				This method is provided to uplift the farmer's income and reduce the productivity cost.
2019, Chinnusamy et al.[35]	Aim				This method is provided to uplift the farmer's income and reduce the productivity cost of Farmer and also agricultural product cost to the consumer through electronic trade (e-trade).
	Region				India
	Technology				Platforms
	problem				Access to accurate, up-to-date and comprehensive agricultural marketing information is essential for farmers. It is unclear to what degree agricultural marketing information systems are used and accessed in Tharaka Nithi and across Kenya. In many cases, farmers, extension workers, and policymakers are unable to get the information they need to make decisions.
2019, Amer et al.[36]	Aim				Farmers' access and use of agricultural marketing information systems are being evaluated, and recommendations for changes are being made to help ensure that future agricultural marketing information systems are more robust, user-friendly, and accessible.
	Methodology				Data was collected through semi-structured interviews and analyzed by use of qualitative and quantitative methods.

In 2018, Akbar et al.[37]	Analysis and findings	Findings show that, a number of agricultural marketing information system platforms exist in Tharaka Nithi. Farmers who had access to relevant information on appropriate farming methods and output marketing sold their farm produce at higher prices.	ions	investigate policy approaches which can suit the rapid growth, so that they can meet the objectives of digital agriculture and agricultural development.
	Recommendations	Due to a number of changes, including those in technology, literacy, information packaging, and the low ratio of extension workers to farmers, among other things, these information systems have not completely met farmers' information demands.	product	Agricultural development.
	product	production and marketing of farm produce.	Region	Africa
	Region	Tharaka Nithi and Kenya	Technology	Web-Based
	Technology	Web-based	problem	Farmers, leaders, and organizations will be able to strengthen conventional agricultural practices into more organized techniques of farm documentation thanks to the creation of this management platform.
	problem	Given the distance between farmer groups, a web-based activity management solution is needed.	Aim	This initiative is aimed to help small-holder farmers, farmer cooperatives, and farmer groups adopt Agro-Entrepreneurship and connect to institutional markets. This data management software will help farmers and their executives manage farmer and product information and monitor clustering-related data. Provisions for the Production Module and Financial Module enable farmers to manage agricultural data systematically.
	Aim	This application is planned to provide the foundation for managing IT-based farmer organizations and for developing communication networks among salak farmers in Gapoktan of Ngudi Luhur.		Leaders and smallholder farmers believe that an information management system that documents agricultural data and procedures makes them better organized. Farmer leaders and members feel that current and historical data helps them improve their operations and processes and estimate output and price. Through the produced reports, the farmer may view the large picture of the agricultural process, enabling him to successfully manage it from planting to harvest.
	Methodology	Observations with interviews directly with farmer groups.	Analysis and findings	After analyzing the research's results, the following are suggested for future study and improvement: Farmer knowledge and traditional traditions are the primary sources of information for the system, which is not typically based on scientific application. Individual and cognitive processes of farmers, their acquisition of information about farming and its methodology, structure and management, will be a fertile area for further study in the future. Some farmers may not be able to supply a single general production procedure because of the clustering approach to production. Individual farmers' most successful approaches may also be studied in rural areas in order to integrate the best practices.
	Region	Indonesia	Recommendations	
	Technology	Platform	Region	Philippines
2018, Bhende et al.[38]	problem	Indian farmers faced various problems, including getting a decent return on their work and investment. Seasonal limitations and crop life restrict farmers' ability to evaluate market circumstances.	Technology	Web-based platform
	Aim	Using the KNN algorithm as a nearest neighbor search for better decision making and the Haversine algorithm to check latitude and longitude using GPS system, one can explore and analyze the current market situation while selling or purchasing crops at various layers of the marketing chain, providing multiple options (market, merchant or end user).	problem	Farmers need dependable market linkage information systems to connect with buyers. Poultry producers face similar technical challenges.
	product	Crop	Aim	Researchers in this research sought to establish a web-based market linkage platform for poultry that was easier to use and user-friendly, as well as a way to evaluate the user experience. The built web-based platform's user experience was put to the test using eye tracking, retrospective thinking aloud, and facial expressions.
	Region	India	Analysis and findings	Finding postings for chicken and poultry product commercials and getting more information on the marketed items made users feel joyful, according to an eye tracking experiment for user experience. Users had difficulties while attempting to set up an account on the web-based platform and making online purchases.
	Technology	Android	product	Livestock
	problem	Some of the problems faced by farmers in Indonesia to market their agricultural products.	Region	Tanzania
	Aim	Application for Marketplace Agricultural Product facilitate Farmers to market	Technology	Web service
	product	Vegetables or fruits	Aim	Agricultural market information system collects, processes, and distributes pricing data. KomoditiAceh is a web-based agricultural commodities pricing information system for Aceh.
	Region	Indonesia		
	Technology	Mobile phones & internet		
2018, Nugroho et al. [39]	problem	The research contains a number of important caveats. There are varying degrees of relevance associated with the influence that mobile phone penetration and internet use have on the progression of agricultural practices in various nations. It is not surprising that there are varied importance levels since mobile phone prevalence, internet use, and degrees of agricultural growth are not uniformly dispersed throughout the continent.		
	Aim	The impact of internet and mobile technology on agricultural growth is growing. The consequence is that investing in internet infrastructures should be considered as crucial for establishing the groundwork for improved agricultural growth in order to boost African agricultural industries.		
	Methodology	This study has investigated the non-linear relationship between mobile phones, internet and agricultural development in Africa for the period 2001-2015 using system GMM.		
	Analysis and findings	This indicates that mobile phones and internet stimulate agricultural development which, in turn, boosts mobile penetration and internet usage even further in these countries.		
	Recommendations	There is therefore a need for future research to		
2018, Mambile et al.[42]				
2018, Evans et al.[40]				
2017, Mutiawan i et al.[43]				

Methodology	Questionnaire.
Region	Aceh province, Indonesia

Table 1. Summary of literature review related to agricultural Web-Based Systems. Researchers are integrating quantitative and qualitative methods to better understand webpages. There have been many studies that have utilized a variety of methods to analyze content on agricultural goods websites, and this study will examine such studies. This will help researchers and practitioners better grasp what has been done in the area of agriculture so far. Those in the business may utilize the data to determine their market position and the strengths and weaknesses of their own websites. Academia should anticipate this study to encourage more research into agriculture website assessment methods and other relevant areas since its results highlight research gaps. To determine whether their web-based strategies, which were deployed in operations, benefited farmers and merchants in their obligations, 26 studies were used in this research. In the end, all of it was run via a single web-based platform. But for now, utilize smartphone apps since they're the best method to get data and make rapid connections between farmers and their farms and farms.

5. CONCLUSION

The use of the traditional system in marketing agricultural products in such large and varied quantities necessarily requires the use of systems and technology such as the Internet, servers, and mobile phones, as well as taking advantage of the technology's capabilities in terms of calculation accuracy and implementation speed. Based on the foregoing, it became clear that an electronic system for agricultural product management and marketing needed to be developed and implemented. Thousands of e-marketing specialists have been established, and the use of e-marketing has contributed to its rapid global spread because of its

low cost and the opportunity to increase its ability to expand the market. E-marketing also lets customers get the information they need in many different fields and for many different reasons. It also lets them get the products they need to meet their needs.

The marketing of agricultural goods is a significant business that is increasing at a rate comparable to that of other industries. This web-based tool is used to aid with database upkeep. It has a hospitable environment that stimulates consumer interaction. As a consequence, it simplifies the procedure by saving us time and effort. It will assist the management in controlling and managing the system's operations effectively and efficiently. Another feasible modification is the integration of the system with bigger organizations, such as agricultural information centers, in order to better serve them. After analyzing various sorts of research, it has been feasible to reach the conclusion that the web-based systems that have been implemented have been advantageous to the organizations. However, there were also variances across the trials, since each used the system in a unique manner. Several methods were demonstrated to be more or less advantageous for each study assignment in terms of efficiency, time efficiency, performance, and job task facilitation. They investigate some of the most essential and basic challenges that may affect agriculture and farm administration, such as how information and data, managers, and services are given to farmers, and how manager and consumer demand for agricultural goods must be satisfied. Finally, strong agricultural assistance, whether local or worldwide, may create revenue for the government or even investment and economic growth, making the improvement or creation of a new model a pressing need for this business.

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