

CROP MANAGEMENT FOR FARMERS USING MACHINE LEARNING ALGORITHMS

I. ABSTRACT

This project aims to assist farmers by providing web services that can be used by suppliers, transportation, and buyers. This project ensures greater profitability through direct communication between farmer to supplier and farmer to customer. It allows farmers to communicate with respective dealers and buy goods from them. When dealers publish goods available for them from their portal, farmers can view the goods available to buy in their portal. The farmers may also register their complaints using their respective login on a separate complaint page where it can only be seen by dealers. And another portal is the customer portal. A farmer can sell his goods directly through this website to the customer without the need of middlemen. Farmers can sell to customers with the help of transportation which is also available on this website. The farmers may also submit their grievances and complaints to respective dealers or authorities using their farmer login in a separate complaints page and authorities will get access to that page regularly using their login id and passwords. The service boosts business communication and brings transparency to the system. It can be over for multiple villages to communicate and deal with each other. Farming tips are given to farmers easily and their complaints can be solved. This site allows good farmer, retailer, and supplier communication. It provides an option of login to farmers and communicates to respective dealers. Farmers are notified whenever dealers publish an advertisement or ad on the website through SMS messages.

II. INTRODUCTION

Agribusiness assumes a fundamental part in India's economy. Over 58% of the rustic family units rely upon farming as their chief methods for vocation. As per the second prompted gauges by the Central Statistics Office (CSO), the offer of agribusiness and associated areas (counting horticulture, domesticated animals, ranger service and fishery) is assessed to be 17.3% of the Gross Value Added (GVA) during 2016-17 at 2011-12 costs. The GDP of agribusiness and associated areas was recorded at \$244.7 Bn in FY '16. The Indian food and staple market is the world's 6th biggest, with retail contributing 70% of the deals.

The Indian food handling industry accounts for 32% of the nation's complete food market, perhaps the biggest business in India and is positioned fifth regarding creation, utilization, trade and anticipated development. It contributes around 8.80 and 8.39% of Gross Value Added (GVA) in Manufacturing and Agriculture individually. 13% of India's fares and what's more, six percent of all out mechanical ventures. India holds the record for the second-biggest farming area on the planet, with around 60% of the country's Indian families making their living from horticulture. The farming area in India utilizes half of our populace furthermore, we are enormously reliant on the ranchers and rural workers to give us methods for food. However, this is probably the most dangerous area to be utilized on the grounds that it is reliant on wild factors like climate, market variances and geological conditions. Endeavour are being made to give this area and its laborers a genuinely necessary lift. What's more, the greatest method of doing this is through progressions in horticulture innovation. Present day strategies and techniques will unquestionably raise horticulture to the following level and facilitate the weight on ranchers. This consequently makes a tremendous degree for Agribusiness Start-ups in the nation. Change of Agriculture to Agribusiness is one of the significant systems where ambitious ranchers practice beneficial horticulture.

III. OBJECTIVE

The main objective of this website is to bring all the farmers and consumers to one place. Through this website, farmers can sell their products directly to the consumers without involving any wholesaler or retailer. With this they can gain a high-profit margin for their product and also consumers can get fresh and healthy products at appropriate prices. This website also helps farmers to get information about the crops, fertilizers, weather, and best farming practices they should use to increase their yield. Farmers can also resolve their queries related to farming by using OpenAI technology inbuilt on our website. At last, the result of this project is that the farmers will get a better price for their products and consumers will receive fresh and chemical-free products at their homes. This service boosts business communication and brings transparency to the system.

IV. RELATED WORK

Paper Title & Year	Authors	Abstract
FARM MANAGEMENT INFORMATION SYSTEMS: A CASE STUDY ON GERMAN MULTIFUNCTIONAL FARM (2014)	Christoph NebojSa Novković Husemann	Farm Management Information Systems (FMIS) that are accurate and simple to use are critical for successful operational farm management. However, many farmers still do not use FMISs for a variety of reasons, including a lack of understanding and the complexity of many accessible FMISs. Appropriate MISs are scarce, particularly for small to medium-sized farms and multifunctional farms. The purpose of this study is to deduce a concrete FMIS from a general FMIS. The concrete FMIS must be tailored to the requirements of medium-sized and multifunctional farms. This means that the farmer must be given the authority to allocate the farm's limited resources. As a result, we chose a German farm in the state of North Rhine Westphalia as a case study to conduct a system analysis. The case study assists in identifying and analysing relevant material and information flows, manufacturing processes, and their interconnections and synergies.
Web Based Application for Agriculture: "Smart Farming System" (2020)	F. M. Javed Mehedi Shamrat, Md Asaduzzaman, Pronab Ghosh, Md Dipu Sultan, Zarrin Tasnim	Bangladesh is fundamentally an agrarian country, with farming land playing a critical role in accelerating economic development. Horticulture remains the mainstay of the Bangladeshi economy, accounting for 19.6 percent of the public GDP and employing 63 percent of the workforce. According to a National Agricultural Census study, Bangladesh today has 16.5 million rancher families. The survey also highlighted the fact that there are over 4,000,000 landless ranchers, with about 6.8 million ranchers cultivating others' property. We develop and foster an electronic application called "Shrewd Farming System" to assist ranchers and work on inagrarian issues. Through this framework, Bangladeshi ranchers can learn and share various knowledge and issues encountered when producing. Ranchers can obtain data around different sicknesses and resolver on their concerns. They can get support in differen agrarian exercises, by the assistance of the specialists and specialists through the "Shrewd Farming System. To foster this framework, we utilized HTML5, CSS, Bootstrap, and JavaScript. Moreover, the PHP system is utilized to deal with the MySQL information base. In testing stage, we tried it with a local area put together virtual entertainment with respect to Facebook and its work

		incredible with expecting groups are anticipating that these administrations should intrigue.
Research on the Development of Ecommerce Model of Agricultural Products (2017)	Yaping Huiping Mu Huo	Recently, electronic agricultural item commerce has grown rapidly. Many excellent situations and business models have emerged in the improvement interaction of electronic business of farming products. For instance, the modern community model (item driven type), the original life model (promotion driven type), and the Suichang model (administration stage type). The designer dissects and examines each model from seven perspectives, summarising their differences and linkages. Finally, the author offers proposals for the advancement of electronic farming company in China. As needed, a modem can deliver SMS or recorded voice alarms. In order to attain maximum efficiency, such a system would enable real-time monitoring and expert assistance. It would serve as a complete system for assessing, monitoring, informing, and assisting farmers at various phases of the farming process.
Perspectives of a Farmer Digital Expert Assistant System (2016)	Vigneswaran Narayanamurthy	The global positioning system (GPS)-based farmer digital expert assistance systems (FDEAS) are able to evaluate the agricultural field and the environmental elements related to the field. Agriculture output is influenced by a variety of factors, including soil moisture content, mineral content, field location, microbiological makeup, and environmental temperature. Irrigation, chemical spraying of animals or intruders entering the area, and other factors are also factors. This technology keeps track of all of these characteristics and then gives the farmers the relevant readings and advice. A variety of parameters are tracked using a variety of sensors. The GPS position can be compared to existing databases of soil maps to determine the nature and type of crop to be cultivated, as well as all requirements necessary to achieve optimal yield at that place. Cameras might be used to keep an eye on the field and send out alerts. All sensor outputs and systems can be linked to a GSM modem, which can deliver SMS or recorded audio alarms as necessary. Such a system would allow for real-time monitoring and expert support in order to achieve optimal efficiency. It would function as a comprehensive system for evaluating, monitoring, notifying, and aiding farmers at various stages of the farming process.

Smart Agricultural Technology (Journal)	Dr. Spyros Fountas, Dr. Minzan Li, Dr. Stephen Symons	<p>This publication, which serves as a companion to the esteemed Computers and Electronics in Agriculture journal, offers a forum for the widespread use of technology in:</p> <ul style="list-style-type: none"> · On-farm planning and production efficiency employing new technologies (crop identification, environmental impact, energy efficiency, adoption studies, socio-economic assessment). · Farm zone identification in terms of soil types and water management. · The soil (preparation, monitoring, health management). · Planting, growing, harvesting, and detecting pests and diseases. · Animal welfare, nutrition, robotic tracking, and processing. · On farm storage, primary product sorting or grading, pest identification, and evaluation of product quality.
Agriculture Management System	Siva Devan	<p>Through the agricultural information system, users and researchers can gain online access to crop information, statistical data, and new trends. The crop patterns behave in such a way that they will be quite essential to Internet users. The major aspects of the information system are information from anywhere, user information on fertiliser, research institutes and researches, land availability, diseases, acceptable soil concentration for the corresponding crops, statistical information on exports, and so on. It also contains thorough information on intercrops related to the core crops. The system not only allows authorised workers in the corresponding institutes to retrieve information, but it also allows them to update it. The system's front end was built with Java, and the back end was built with SQL Server. For retrieval and update, the front end graphical user interface uses Java Applets, ASP Interfaces, and embedded SQL Queries to access the back end SQL Server Database. A SQL Server is used to connect the front end and back end. The agricultural information system in Sri Lanka can be maintained by four institutes: Agalawatta Rubber Research Institute, Thalawakale Tea Research Institute, Lunuwila Coconut Research Institute, and Gannoruwa Rice Research Institute. They will be able to access it through the Internet. To log into the database, users will be given a logon name and a password. Netscape Communicator 4.0 and Internet Explorer 4</p>

V. METHODOLOGY

A. Modules used.

PHP

PHP is a general-purpose scripting language geared towards web development. PHP code is usually processed on a web server by a PHP interpreter implemented as a module, as a Common Gateway Interface (CGI) executable. On a web server, the result of the interpreted and executed PHP code which may be any type of data, such as generated HTML or binary image data - would form the whole or part of an HTTP response. Various web template systems, web content management systems, and web frameworks exist which can be employed to orchestrate or facilitate the generation of that response. Some important points that need to be noticed about PHP are as followed:

HTML

The Hyper-Text Markup Language or HTML is the standard markup language for documents designed to be displayed in a web browser.

Uses of HTML:

With HTML constructs, images and other objects such as interactive forms may be embedded into the rendered page. HTML provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists, links, quotes, and other items

CSS

Cascading Style Sheets, fondly referred to as CSS, is a simple design language intended to simplify the process of making web pages presentable. CSS is used to control the style of a web document simply and easily. CSS handles the look and feel part of a web page. Using CSS, you can control the style of fonts, the spacing between paragraphs, how columns are sized and laid out, what background images are used, layout designs, variations in display for different devices, and screen sizes as well as a variety of other effects. CSS is easy to learn and understand but it provides powerful control over the presentation of an HTML document

MYSQL

MySQL is a relational database management system based on SQL - Structured Query Language. The application is used for a wide-range of purposes, including data warehousing, e-commerce, and logging applications. In association with a scripting language such as PHP or Perl, it is possible to create websites that will interact in real-time with a MySQL database to rapidly display categorized and searchable information to website user.

Uses of MySQL:

The most common use for MySQL however, is for a web database. It can be used to store anything from a single record of information to an entire inventory of available products for an online store. for different devices, and screen sizes as well as a variety of other effects. CSS is easy to learn and

understand but it provides powerful control over the presentation of an HTML document

XAMPP

XAMPP is a software distribution that provides the Apache web server, MySQL database (actually MariaDB), Php, and Perl (as command-line executables and Apache modules) all in one package

What is XAMPP used for?

XAMPP is an abbreviation for cross-platform, Apache, MySQL, PHP, and Perl, and it allows you to build WordPress sites offline, on a local web server on your computer. This simple and lightweight solution works on Windows, Linux, and Mac - hence the "cross-platform" part.

B. Input/Output

Input

1. User data (of farmers and buyers)
2. Crop name
3. Crop Quantity

Output

1. Profile info (user data)
2. Display buyer information
3. Product information
4. Display reviews and complaints
5. Right price paid to farmers

C. Dimensions

Transparency

Agri e-commerce - the trading of farming produce on the web - can address eminent difficulties and failures in the horticulture inventory network by smoothing out farmers' admittance to the client and making new connections between steps in the value chain. This is particularly evident in agricultural nations where online stages can empower farmers to sidestep delegates and sell straightforwardly to agri-organisations, retailers, shoppers and other client gatherings, driving to expanded productivity of the store network and creating more pleasant earnings, as well as an exchange history for farmers. One such challenging factor/dimension discussed is transparency. Transparency is simply communication, openness and accountability. Clients need to feel like e-commerce shops and locales are being straightforward and giving them the entirety of the data and not playing a game. More prominent straightforwardness prompts less deserted shopping baskets and more fulfilled clients. We have also given transparency to the value chain, that is, farmers don't have to give any extra fees to the 3rd party. Farmers will get the full payment of what they wish to sell. To enhance transparency, few areas are to be focused like product availability, pricing and promotion, shipping and handling fees and clarity. With transparency comes trust, so if we are unable to build trust with our customers, then

transparency won't come in business. All through the supply chain - from maker to merchant to retailer to end buyer – the associations between each party are progressively remote. At the point when fixings, makers and end buyers may each be in an alternate location, keeping up with control and perceivability all through the whole organization - or online business straightforwardness is more significant now than any other time in recent memory. There is a developing business sector strain for transparency.

Organizations that convey genuineness and transparency draw in more clients, merchants and retailers favor brands with reputation, and makers need to lay out steady and moral stock chains.

Customer Satisfaction

Customer satisfaction is the most important dimension for any E-Commerce Site and more so for KisanBazar. The experience these people have with the site and their satisfaction will influence a wide range of decisions they will make while considering our site. The target audience/customer base for KisanBazar is farmers. Most farmers in India come from a rural background with limited education and awareness. Hence, it is important for the site to be easy to use, readable, have a simple interface and so, so that the farmers don't face any difficulty while using our site. It's important to know from the customers what were the difficulties that they faced so that those could be improved upon and new features could be added to increase the customer base. The success of a business is directly proportional to the customer satisfaction level.

Authentication

Authentication confirms one party's identification to another and is a basic set of operations used to validate product quality and features, the trading parties' authenticity, and monitor contract or agreement compliance. Online buyers and sellers must obtain authentication information about one another and verify that the information is accurate. Credit cards and digital certificates approved by financial institutions are used to provide overall buyer authentication in internet commerce. Product authentication is accomplished by product try-outs, while seller authentication is accomplished through URL, advertising, and virtual communities. Lack of total product authentication, dependability of trusted third parties, and scenarios where one or both parties to the transaction seek anonymity are all examples of authentication issues.

Privacy

the ability to govern one's personal data - and security - unauthorized access to data - are two major concerns for both e-commerce customers and websites. Consumers will not visit or shop at a site unless both are considered, and sites cannot function successfully unless both are considered. In KisanBazar, privacy refers to the preservation of the privacy of persons involved in commerce transactions. People disclose personal information while trading on our platform, and that

information is created and reaches the hands of third parties. As a result, it's critical to protect both farmers' and buyers' personal information; in this way, privacy can assist us in safeguarding our data and personal information. We at kisanbazar, before collecting the data we disclose in clear language how and what data we collect.

D. Languages to be used

- Design and Interface: HTML, CSS
- Programming language: PHP
- Scripting language: AJAX, Javascript
- Database: MySQL Server

E. Platform To Be Used

- VS Code
- Sublime Text
- XAMPP

F. Unique Selling Proposition

- We do not act as a third party, i.e farmers get their proper share.
- Farmers and sellers are directly connected and the website mostly serves as
- benefits and welfare of farmers - we have included news, blogs and articles
- for farmers to read and gain information.
- Providing a platform for case of communication and buying and selling of goods with registering complaints.

VI. CONCLUSION

This project is an initial proposal to show that this kind of website provides benefits to the farmers as well as consumers in terms of money and products respectively. The real benefit of this type of website is to empower the farmers and remove them from a vicious cycle into a virtuous cycle by which the farmers had good cash flow, which led to high investment into farming equipment that led to high productivity, eventually giving them thicker margins and better cash flow. Also, to enhance their knowledge in different fields apart from farming.

VII. REFERENCES

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