A PRELIMENERY REPORT ON

EFFICIENT FARMER TO CONSUMER WEB APP

SUBMITTED TO THE MUMBAI UNIVERSITY, MUMBAI
IN THE PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE AWARD OF THE DEGREE

OF

BACHELOR OF ENGINEERING (INFORMATION TECHNOLOGY)

SUBMITTED BY

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Under the Guidance of

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A.Y. 2023 - 2024

CERTIFICATE

This is to certify that the Project report entitled

"**EFFICIENT FARMER TO CONSUMER WEB APP**"

Submitted by

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is a bonafide student of this institute and the work has been carried out by him/her under the supervision of **Prof. Madhuri Patil** and it is approved for the partial fulfillment of the requirement of Mumbai University, for the award of the degree of **Bachelor of Engineering** (Information Technology).

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PROJECT REPORT APPROVAL

This Project entitled "**EFFICIENT FARMER TO CONSUMER WEB APP**" by **MR. KADAM DARSHAN BALASAHEB (UID 121IT3236A), MR. NIPANE ARYAN SANJAY (UID 120IT1228A), MR. PAWAR HERSCHEL PRAVIN (UID 120IT1108A), MR. THORAT MANISH SANTOSH (UID 120IT1006A)** is approved for the degree of Bachelor of Engineering in Information Technology.

Examiners

1...
External Examiner

2……………………………
Internal Examiner

Place: Kamothe

Date:

DECLARATION

We declare that this written submission represents our ideas in our own words and where other's ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will be cause for disciplinary action by the institute and can also evoke penal action from the source which has thus not been properly cited or from whom proper permission has not been taken when needed.

Sr. No.	Name of Student	UID	Signature
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ACKNOWLEDGEMENT

ABSTRACT

This paper introduces a MERN stack-based web platform designed to connect farmers, consumers, and sellers, with the primary aim of facilitating direct exchanges of agricultural products. The platform enables farmers to list and promote their produce, consumers to browse and purchase locally-sourced items, and sellers to market agricultural supplies. The MERN stack technology ensures scalability and responsiveness, offering a user-friendly interface for all participants.

The website's core objective is to eliminate intermediaries in the agricultural supply chain, fostering more efficient and transparent transactions. By promoting direct sales and reducing overhead, this platform empowers farmers, benefits consumers with access to fresh local products, and offers sellers a dedicated agricultural clientele. The potential impact includes a more sustainable, equitable food system and improved agricultural sustainability.

In summary, this paper presents a technology-driven solution to bridge the gap between farmers, consumers, and sellers in the agricultural market, offering a user-friendly and efficient platform to promote direct transactions and enhance the quality and sustainability of the agricultural supply chain.

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CHAPTER 1

INTRODUCTION

The agricultural sector, a cornerstone of human civilization, is currently at the cusp of significant transformation, driven by the confluence of technology and evolving consumer preferences. In recent years, there has been a discernible shift in how agricultural products reach consumers. The traditional model, characterized by a convoluted and often inefficient supply chain with multiple intermediaries, is making way for a more direct, digitally-infused approach. This shift arises from the increasing demand for fresh, locally-sourced products and a growing awareness of the environmental and economic benefits associated with reduced supply chain complexity.

In response to these evolving demands, a novel web platform has emerged as a key player, leveraging the capabilities of the MERN stack (MongoDB, Express, React, Node.js). This platform is designed to address the critical challenge of bridging the gap between three integral players in the agricultural ecosystem: farmers, consumers, and sellers. By fostering direct interactions and transactions among these stakeholders, it aims to optimize the exchange of agricultural products while promoting transparency, trust, and sustainability within the sector.

The platform's central function is to provide an online marketplace where farmers can showcase their produce and connect directly with consumers. By doing so, it removes the need for intermediaries, thus streamlining the agricultural supply chain. This approach has far-reaching implications, not only in terms of boosting the economic prospects of farmers but also in granting consumers access to a wide range of fresh, locally-sourced agricultural products. Furthermore, the platform extends its reach to sellers, who offer an assortment of essential agricultural supplies, including seeds, equipment, livestock, and dairy products.

Within the context of this paradigm shift, the MERN stack, comprising MongoDB, Express, React, and Node.js, emerges as a technological bedrock that underpins the platform's robust functionality. MongoDB, as a database system, facilitates the efficient storage and management of diverse data associated with agricultural products and transactions. Express and Node.js provide the necessary server-side framework, while React offers an intuitive and responsive user interface, ensuring the scalability and adaptability required to accommodate the dynamic and multifaceted agricultural market.

This paper dives into the development and implications of this innovative web platform, offering a comprehensive understanding of how technology can reshape and revitalize the agricultural sector. The aim is not just to connect farmers with consumers, but also to empower agricultural suppliers and promote an efficient, transparent, and sustainable food supply chain. As we delve deeper into the nuances of this transformative endeavor, it becomes evident that the platform has the potential to drive the growth of the agricultural sector, improve access to high-quality, locally-sourced agricultural products, and bolster the sustainability of the agricultural ecosystem as a whole.

1.1   PURPOSE

The primary purpose of this research paper is to comprehensively explore and elucidate the development and potential impact of an innovative web platform designed to facilitate direct interactions and transactions among farmers, consumers, and sellers within the agricultural ecosystem. This purpose can be further broken down into the following specific objectives:

1. Platform Development: To provide an in-depth understanding of the technical underpinnings of the web platform, with a particular focus on the use of the MERN stack, including MongoDB, Express, React, and Node.js, and its role in enabling a user-friendly interface for all participants.

2. Stakeholder Engagement: To examine the distinct roles and interactions of the three primary stakeholders - farmers, consumers, and sellers - within the platform, showcasing how it enables each of them to benefit from a more direct and efficient agricultural market.

3. Supply Chain Streamlining: To highlight the role of the platform in reducing intermediaries and streamlining the agricultural supply chain, ultimately resulting in more efficient and transparent transactions.

4. Economic Empowerment: To assess the economic implications of the platform, specifically how it empowers farmers by allowing them to reach a broader consumer base, potentially increasing their income and profitability.

5. Consumer Access: To investigate how the platform benefits consumers by providing them with access to fresh, locally-sourced agricultural products, promoting the consumption of healthier and more sustainable food choices.

6. Sustainability and Transparency: To underscore the potential impact of the platform in fostering greater sustainability and transparency within the agricultural sector, with a focus on promoting environmentally conscious agricultural practices.

7. Supplier Support: To shed light on how the platform accommodates agricultural suppliers, who play a crucial role in ensuring farmers have access to the necessary tools, equipment, and resources for a thriving agricultural enterprise.

1.2 <u>SCOPE</u>

This research paper focuses on a multifaceted exploration of an innovative web platform connecting farmers, consumers, and sellers in the agricultural sector. The scope includes:

1) Technical Aspects:
- In-depth analysis of the MERN stack's role in platform development.
- Examination of the platform's technical architecture and user interface.

2) Stakeholder Dynamics:
- Understanding the roles and interactions of farmers, consumers, and sellers.
- Exploring how the platform facilitates direct connections and transactions.

3) Supply Chain Optimization:
- Investigation into the platform's contribution to streamlining the agricultural supply chain.
- Analysis of its impact on transaction efficiency and transparency.

4) Economic Empowerment and Consumer Benefits:
- Assessing the financial benefits for farmers and enhanced consumer access to local products.
- Emphasizing the potential influence on consumption choices and sustainable farming practices.

5) Sustainability and Transparency:
- Discussion of the platform's role in promoting sustainability and transparency in agriculture.
- Highlighting its impact on environmentally conscious practices and supply chain transparency.

6) Supplier Engagement:
- Insight into how the platform supports agricultural suppliers.
- Ensuring resources for farmers and a dedicated agricultural clientele.

7) Future Implications and Limitations:
- Consideration of scalability and broader industry impact.
- Identification of potential limitations and challenges in platform implementation.

CHAPTER 2

<u>LITERATURE SURVEY</u>

2.1 Digital Market: E-Commerce Application For Farmers:

By: Mamata Khatu, Neethu Kaimal, Pratik Jadhav and Syedali Adnan Rizvi

The concept of a "digital market" represents a transformative platform in India that aims to connect farmers, merchants, government authorities, and end-users, bridging gaps between these key stakeholders. Indian farmers face various challenges, including limitations due to seasons and the short lifespan of crops. This platform provides real-time market information, empowering farmers to make informed decisions. Traditionally, farmers faced difficulties reaching merchants physically, limiting their options for selling their products. Furthermore, the lack of transparency in government-regulated minimum crop prices has been a concern.

The platform leverages technology, including mobile-based Android apps for farmers, users, and merchants, alongside web-based Java applications for government access. It utilizes algorithms like KNN for decision-making and Haversine for GPS-based location verification during transactions. The government can set rules and minimum prices, resolve complaints, and manage price fluctuations using data-driven techniques.

Despite its benefits, one challenge is tracking transportation records in real-time. In summary, this digital market platform addresses critical issues in India's agricultural sector, promoting transparency and empowering farmers to access a broader client base and make more informed decisions.

CHAPTER 2

<u>LITERATURE SURVEY</u>

2.2 Crop prediction using machine learning:

By: Madhuri Shripathi Rao, Arushi Singh, N. V. Subba Reddy and Dinesh U Acharya

For most developing countries, agriculture is their primary source of revenue. Modern agriculture is a constantly growing approach for agricultural advances and farming techniques. It becomes challenging for the farmers to satisfy our planet's evolving requirements and the expectations of merchants, customers, etc. Some of the challenges the farmers face are- (i) Dealing with climatic changes because of soil erosion and industry emissions (ii) Nutrient deficiency in the soil, caused by a shortage of crucial minerals such as potassium, nitrogen, and phosphorus can result in reduced crop growth. (iii) Farmers make a mistake by cultivating the same crops year after year without experimenting with different varieties. They add fertilizers randomly without understanding the inferior quality or quantity. The paper aims to discover the best model for crop prediction, which can help farmers decide the type of crop to grow based on the climatic conditions and nutrients present in the soil. This paper compares popular algorithms such as K-Nearest Neighbor (KNN), Decision Tree, and Random Forest Classifier using two different criterions Gini and Entropy. Results reveal that Random Forest gives the highest accuracy among the three.

CHAPTER 2

<u>LITERATURE SURVEY</u>

2.3 Soil Analysis and Crop Recommendation using Machine Learning:

By: Aditya Motwani, Param Patil, Vatsa Nagaria, Shobhit Verma, Sunil Ghane

India is the land of agriculture and is among the top three global producers of many crops. The Indian farmer lies at the heart of the agricultural sector yet most Indian farmers remain at the bottom of the social strata. In addition, farmers find it difficult to decide which crop is best suitable and profitable for their soil, in spite of the few technological solutions that exist today, due to the variation in soil types across geographical regions. This paper proposes a crop recommendation system that uses a Convolutional Neural Network (CNN) and a Random Forest Model to predict the optimal crop to be grown by analyzing various parameters including the region, soil type, yield, selling price, etc. The CNN architecture gave an accuracy of 95.21 %, and the Random Forest Algorithm had an accuracy of 75%.
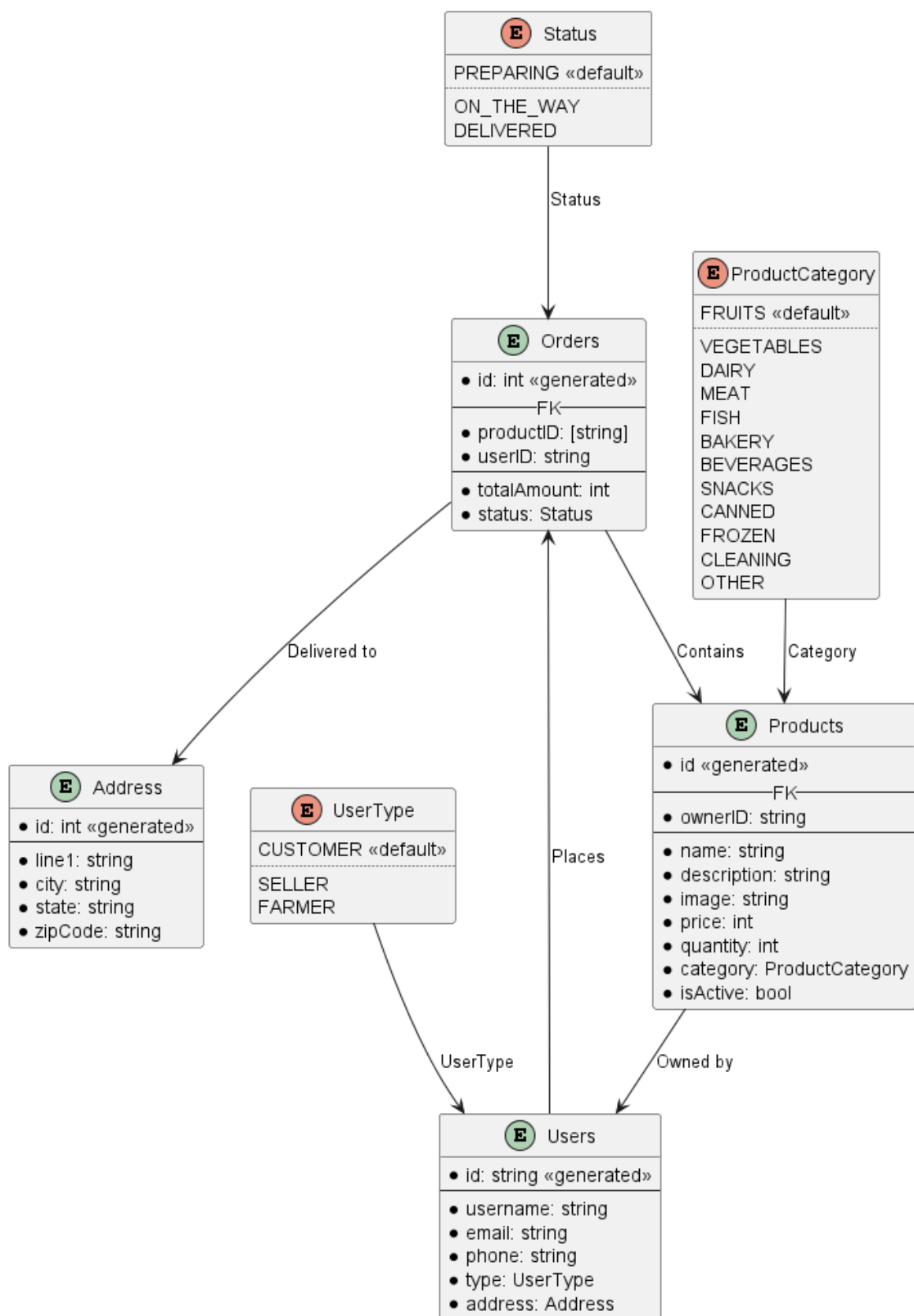
CHAPTER 3

DESIGN & IMPLEMENTATION

WORKING

The project is built using the MERN stack, which stands for MongoDB, Express, React, and Node.js, each playing a crucial role in making the system efficient and user-friendly. MongoDB serves as the database, where all the data about the products, farmers, and consumers is stored. Express and Node.js work on the server-side, handling requests and making sure data gets to the right places. React, on the other hand, provides a user-friendly interface, making it easy for farmers to list their products and for consumers to browse and buy.

Behind the scenes, REST API (Representational State Transfer Application Programming Interface) is used to facilitate communication between the different parts of the project. It ensures that when a farmer lists a product, that information gets to the database and is then presented to consumers in a user-friendly way. It also helps with secure payments when a consumer buys a product.

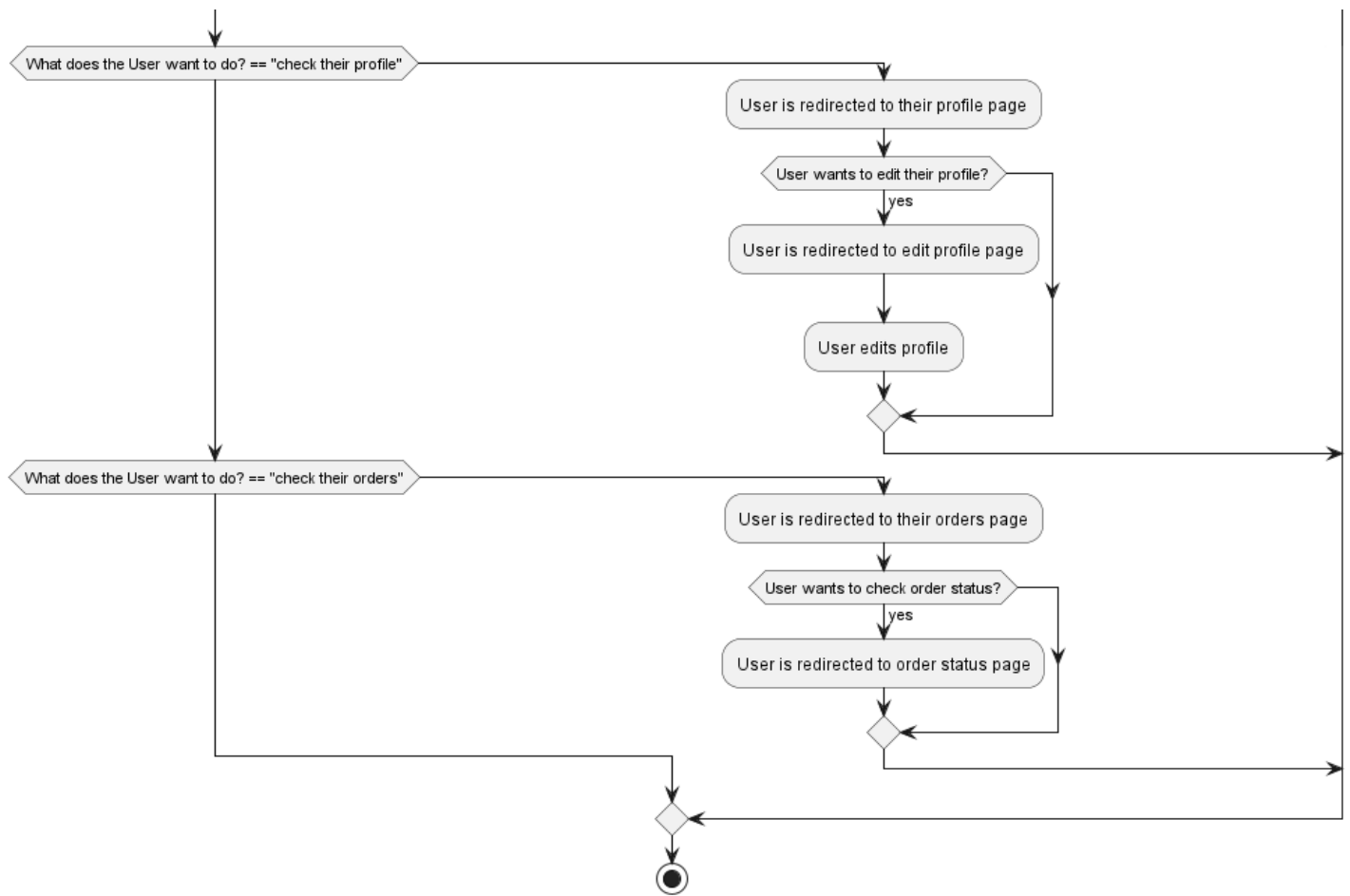So, in simple terms, the project uses a special set of tools to make sure that when a farmer wants to sell something, it gets listed properly and is easy for people to buy. All this happens safely and efficiently with the help of REST API, and the data is kept in a big digital storage (MongoDB). This way, the project brings farmers and consumers closer, making transactions smoother and more transparent.

DATABASE ER-DIAGRAM

Status
- PREPARING «default»
- ON_THE_WAY
- DELIVERED

Status

ProductCategory
- FRUITS «default»
- VEGETABLES
- DAIRY
- MEAT
- FISH
- BAKERY
- BEVERAGES
- SNACKS
- CANNED
- FROZEN
- CLEANING
- OTHER

Orders
- id: int «generated»

FK
- productID: [string]
- userID: string

- totalAmount: int
- status: Status

Delivered to

Contains *Category*

Address
- id: int «generated»

- line1: string
- city: string
- state: string
- zipCode: string

UserType
- CUSTOMER «default»
- SELLER
- FARMER

Products
- id «generated»

FK
- ownerID: string

- name: string
- description: string
- image: string
- price: int
- quantity: int
- category: ProductCategory
- isActive: bool

Places

UserType *Owned by*

Users
- id: string «generated»

- username: string
- email: string
- phone: string
- type: UserType
- address: Address

FLOWCHART

What does the User want to do? == "check their profile"

User is redirected to their profile page

User wants to edit their profile?

yes

User is redirected to edit profile page

User edits profile

What does the User want to do? == "check their orders"

User is redirected to their orders page

User wants to check order status?

yes

User is redirected to order status page

CHAPTER 4
<u>RESULTS</u>

PAD CORP Supreme Duo 2 in1 Manual Battery Operated Sprayer Pump 12Volt x 8Amp with 16LTank Capacity 1.7Amp

Brand : PAD CORP

2.0 ⭐⭐☆☆☆

₹1000

Tank Volume : 16 Litres
Colour : Green
Category Type : Fertilizer
Category Type : Fertilizer
Category Type : Fertilizer
Category Type : Fertilizer
Category Type : Fertilizer

Description :

- Strong, Sturdy Body With 16 litre tank capacity high density polyethylene tank. Original Pad Corp printed strong belt with cushion
- Supreme Comes with 12voltx8Amp Battery, Charge time 6 Hrs & Spray time after fully charge 4 hrs
- In accessories stainless steel Telescopic lance comes with four types of Nozzles, Fast Battery Charger With Led Light Indicates, Filter, Metal Black Coated Handle For Manual Opearation, 9 watt LED Bulb With 15 Feet wire and on/off button
- Pad Corp Supreme Battery Operated Sprayer, can used for spraying in Agriculture, horticulture, Garden, Pest Control, etc
- Comes with 4LPM Motor, Light Weight Knapsack Sprayer, LED Indicator, Pressure Regulator Button

Add to Cart   **Buy Now**

Similar Products

PAD CORP Supreme Duo 2 in1 Manual Battery Operated Sprayer Pump   ₹1000
Brand : PAD CORP
Qty : 1 ▼   Remove

PAD CORP Supreme Duo 2 in1 Manual Battery Operated Sprayer Pump   ₹1000
Brand : PAD CORP
Qty : 1 ▼   Remove

PAD CORP Supreme Duo 2 in1 Manual Battery Operated Sprayer Pump   ₹1000
Brand : PAD CORP
Qty : 1 ▼   Remove

BILLING DETAILS

Cart Total	₹ 3000
GST	₹250
Shipping Charges	₹50
Total Amount	**₹3300**

PLACE ORDER

FARMER'S MARKET

Search for Products

Cart   Account

Deliver To

Aryan Nipane   ⊙

H no, B name*
Street name, Area*
Landmark
District/City - Postal Code*
mobile number

EDIT

BILLING DETAILS

Cart Total	₹ 3000
GST	₹250
Shipping Charges	₹50
Total Amount	**₹3300**

CONTINUE TO PAYMENT

FARMER'S MARKET

Search for Products   Press Esc to exit full screen

Cart   Account

Payment Options

Razorpay	⊙

COD	○

BILLING DETAILS

Cart Total	₹ 3000
GST	₹250
Shipping Charges	₹50
Total Amount	**₹3300**

CONFIRM ORDER

4.1 **APPLICATIONS**

1) 1. Agricultural Product Exchange:
  - The primary application of the platform is to serve as an online marketplace for agricultural products. Farmers can list and sell their produce directly to consumers, offering fresh and locally-sourced items, including fruits, vegetables, dairy products, meat, and more.

2) 2. Livestock Trading:
  - The platform accommodates the trading of livestock, enabling farmers to sell animals directly to consumers. This application extends to livestock auctions, breeding stock sales, and the purchase of farm animals for various purposes.

3) 3. Agricultural Supplies and Equipment:
  - Sellers can market and sell agricultural supplies, equipment, and machinery to farmers. This aspect of the platform supports efficient farming practices by providing access to essential resources.

4) 4. Direct Sales of Specialty Products:
  - The platform can be utilized to promote and sell specialty agricultural products, such as organic produce, artisanal goods, and unique local offerings, directly to consumers who seek these items.

5) 5. Subscription Services:
  - Farmers can offer subscription services for regular delivery of agricultural products to consumers, ensuring a steady source of income for farmers and a convenient shopping experience for consumers.

6) 6. Agricultural Tourism and Experiences:
  - Farmers can promote and sell agricultural experiences, such as farm tours, workshops, and agritourism activities, directly to interested consumers.

7) 7. Sustainability Initiatives:
  - The platform can encourage sustainable farming practices by connecting consumers with farmers who prioritize eco-friendly and ethical production methods.

8) 8. Support for Local and Small-Scale Agriculture:
  - The platform can particularly benefit local and small-scale farmers by providing them with a direct and cost-effective means of reaching a broader consumer base.

9) 9. Agricultural Education and Workshops:
  - Farmers and agricultural experts can offer educational materials, workshops, and consulting services directly to consumers interested in improving their agricultural knowledge and practices.

10) 10. Community Building:
  - The platform can foster a sense of community and trust by connecting consumers with the farmers and sellers who produce the food they consume. This engagement can lead to stronger local food networks.

11) 11. Market Research and Data Analysis:
  - The platform generates data that can be valuable for market research and analysis in the agricultural sector, helping stakeholders make informed decisions.

4.2 <u>RESULT</u>

The implementation of the web platform, designed to foster direct interactions among farmers, consumers, and sellers in the agricultural market, has produced a transformative impact across multiple dimensions. A prominent result has been the significant economic empowerment of farmers. Through the elimination of intermediaries, farmers can now secure a greater share of the profits from their agricultural products. This surge in income not only enhances the financial sustainability of farmers but also propels the adoption of sustainable farming practices. This dual impact elevates the agricultural sector's overall economic health and ecological consciousness.

Conversely, consumers have reaped the benefits of this direct-to-consumer model. The platform offers consumers unfettered access to fresh, locally-sourced produce, including a rich array of fruits, vegetables, dairy products, and meats. This newfound accessibility has kindled a transformation in consumer choice, fostering healthier consumption habits and strengthening the bond between consumers and their food sources. It not only encourages support for local farmers but also fuels a broader shift towards an ethically and ecologically responsible approach to food consumption.

Moreover, the platform has catalyzed a streamlined and transparent agricultural supply chain. By reducing the complexities tied to intermediaries, the platform has streamlined transactions and enhanced supply chain transparency. Furthermore, the platform serves as a catalyst for farmers to promote sustainable and eco-conscious farming practices. This not only spurs the growth of sustainable agriculture but also empowers consumers to actively endorse and support such practices, fostering a more responsible and ethically aware agricultural landscape. In sum, the implementation of this web platform has triggered a cascading transformation, benefiting farmers, consumers, and the agricultural sector as a whole.

CHAPTER 5
CONCLUSION AND FUTURE WORKS

5.1 CONCLUSION

The implementation of the web platform designed to connect farmers, consumers, and sellers within the agricultural market has ushered in a new era of efficiency, transparency, and sustainability in the sector. Through direct transactions, economic empowerment for farmers, and improved consumer access to fresh, local produce, the platform has transformed the way agricultural products are exchanged. Furthermore, the streamlined supply chain, support for sustainable farming practices, and the fostering of community connections have laid the foundation for a more robust and responsible agricultural ecosystem. The diverse applications of the platform provide a dynamic framework for addressing various agricultural needs and interests. It is evident that this platform has contributed to the betterment of the agricultural sector, offering a glimpse into the future of a more efficient and sustainable agricultural landscape.

5.2 FUTURE WORKS

While the web platform can achieve remarkable success, there are several avenues for future work that can further enhance its impact and versatility. These include:

1. Enhanced Data Analytics: Expanding data analytics capabilities can provide more insights into market trends, consumer preferences, and sustainability metrics. This data can inform decision-making and help stakeholders make more informed choices.

2. International Expansion: Extending the platform's reach to international markets can create new opportunities for farmers and consumers while promoting global sustainability practices.

3. Blockchain Integration: The integration of blockchain technology can further enhance transparency in the supply chain, fostering trust and traceability for consumers and supporting fair trade practices.

4. Mobile Applications: Developing dedicated mobile applications can improve user experience and accessibility, allowing for real-time updates and transactions on the go.

5. Educational Initiatives: Expanding educational materials and workshops on the platform can help consumers and farmers gain more knowledge about sustainable farming practices and environmentally responsible consumption.

CHAPTER 6

REFERENCES

[1] https://ieeexplore.ieee.org/document/8697615 Digital Market: E-Commerce Application For Farmers by Manisha Bhende, Mohini S. Avatade, Suvarna Patil, Pooja Mishra, Pooja Prasad, Shubham Shewalkar

[2] https://www.researchgate.net/publication/357759181_Crop_prediction_using_machine_learning Crop prediction using machine learning by Madhuri Shripathi Rao, Arushi Singh, N.V. Subba Reddy and Dinesh U Acharya

[3] https://ieeexplore.ieee.org/document/9725901 Soil Analysis and Crop Recommendation using Machine Learning by Aditya Motwani, Param Patil, Vatsa Nagari, Shobhit Verm, Sunil Ghane

[4] https://www.pmkisan.gov.in/

[5] https://www.myscheme.gov.in/

[6] https://www.mongodb.com/docs/

[7] https://expressjs.com/en/5x/api.html

[8] https://react.dev/learn

[9] https://nodejs.org/en/docs