Modern seed supply management using chatbot

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Abstract: The development of a Seed Management System Chatbot, a new tool designed to streamline and increase the efficiency. This chatbot uses natural language processing and artificial intelligence to help researchers, scientists and authors manage the seed data associated with their research. The chatbot provides a user-friendly interface for entering, organizing and retrieving initial information, reducing the burden of manual record keeping and minimizing the risk of data loss. It also helps ensure research traceability and reproducibility by securely storing and managing seed data.

Keywords: Chatbot, Seed Management System, Natural Language Processing, Artificial Intelligence, Research Data Management, Reproducibility.

I. INTRODUCTION

In the ever-evolving world of agriculture and agribusiness, managing the supply chain for seeds is a critical component in ensuring food security and agricultural productivity. The Chatbot is here to revolutionize the way you manage your seed supply chain, making it more efficient, transparent, and user-friendly. Our Seed supply chain management system Chatbot is designed to assist agricultural professionals, farmers, seed suppliers, and all stakeholders involved in the seed industry. It harnesses the power of artificial intelligence to streamline seed procurement, distribution, and quality control processes. Whether you're a smallholder farmer looking for the right seeds, a distributor tracking inventory, or a seed producer ensuring quality standards, our chatbot is your one-stop solution. Our chatbot can help you choose the right seeds based on your crop type, location, and specific requirements, ensuring optimal yields and crop success. Keep track of your seed stock in real-time, allowing you to make informed decisions regarding restocking and avoiding shortages. Simplify the process of ordering seeds from suppliers, automating paperwork and reducing the risk of Get instant updates on seed quality testing results, ensuring that only the highest-quality seeds are distributed. Monitor the entire supply chain, from seed production to end-users, enhancing transparency and traceability. Access valuable information related to seed varieties, planting guidelines, and best practices in seed management. Our chatbot is available 24/7 to answer your queries, provide guidance, and troubleshoot any issues you may encounter.

The Seed supply chain management system chatbot is your virtual assistant dedicated to improving the efficiency of seed supply chain management. Say goodbye to cumbersome paperwork, long phone calls, and the stress of managing your seed operations manually. Embrace the future of seed supply chain management with our innovative chatbot, making your journey from seed selection to harvest a seamless and productive one. Experience the future of seed supply chain management with the Chatbot, and let us help you cultivate success in your agricultural endeavours. The agriculture industry is undergoing a transformative evolution with the integration of cutting-edge technologies, and one of the most promising advancements is the application of artificial intelligence, particularly chatbot, in seed supply chain management. Seed supply chain management plays a pivotal role in ensuring food security and agricultural productivity, as it encompasses the entire journey of seeds from production to distribution and planting., a state-of-the-art language model, has the potential to revolutionize how this critical process is managed, making it more efficient, responsive, and data-driven. software or both. Agriculture is the foundation of the financial system, only agricultural development is nice, the complete economic system can steadily forward the economic development of our country's history suggests that only given an excellent development of agriculture and rural economy the full financial set-up can go to prosperity. in our country, Seed supply is among the most problem to be faced by many farmers in our history. Increasing in population many villages are facing this problem people must suffer from this problem they don't have a sufficient number of seeds for agricultural needs. Some farmers get seeds while others farmers can't so, there's a requirement for continuous monitoring, seed supply scheduling, and proper distribution. Supply chains are primarily concerned with the flow of products and information in the middle of the supply chain for the purchase of building materials, the conversion of building materials for finished products, as well as the distribution of those products to eliminate customers. The traditional seed supply system is an important backup system in agricultural production nationwide, based largely on a variety of farmers except in cases where the seed system relies on a variety of improved or introduced crops. supply chain management which means that control and communication can take place elsewhere and with other partners. The country's Agri supply chain system is determined by various satirical issues such as governance of small and high scale farmers, segregated chains, lack of scale economics, low-level value processing value addition, marketing infrastructure

interventions, etc. Effectively manage the supply chain in conjunction with developing the relationship between goods and transportation within companies due to reduced inventory and better response time to customer requests for products and services. Experience the future of seed supply chain management with the Chatbot, and let us help you cultivate success in your agricultural end savours. The agriculture industry is undergoing a transformative evolution with the integration of cutting-edge technologies, and one of the most promising advancements is the application of artificial intelligence, particularly chatbot, in seed supply chain management. Seed supply chain management plays a pivotal role in ensuring food security and agricultural productivity, as it encompasses the entire journey of seeds from production to distribution and planting., a state-of-the-art language model, has the potential to revolutionize how this critical process is managed, making it more efficient, responsive, and data-driven.

Modern seed supply management using chatbot is not only simplifying the seed procurement process for farmers but also setting new standards for data-driven decision-making in the agricultural supply chain. At its core, this system is a comprehensive platform that optimizes the entire seed supply process, from procurement to delivery. The chatbot, as a critical component, acts as a virtual assistant, bridging the gap between farmers and suppliers, and streamlining communications in real-time. By introducing automation and intelligence to this essential link in the agricultural value chain, Modern seed supply management using chatbot is fostering greater ease and efficiency for farmers, empowering them with the tools they need to succeed. the system employs cutting-edge technologies such as IoT and data analytics to monitor and manage inventory levels, track the movement of seeds, and predict demand. This integrated system represents a visionary approach to agricultural logistics, leveraging cutting-edge technology to streamline the entire seed supply chain. In a rapidly evolving agricultural landscape, where precision and efficiency are paramount, Modern seed supply management using chatbot solution aims to empower farmers, suppliers, and stakeholders with real-time, data-driven insights. This not only simplifies the ordering process for farmers but also revolutionizes inventory management, transportation tracking, and demand forecasting. By optimizing the supply chain, this is driving agricultural productivity to new heights, ensuring timely seed delivery to farmers, and minimizing wastage in the process. sets the stage for an in-depth exploration of this game-changing system, highlighting its potential to revolutionize the agriculture industry by blending technology and innovation to benefit all stakeholders involved in the seed supply chain.

II.   LITERATURE SURVEY

Blockchain technology is a data storage system and the list is created between multiple parties (computers, servers). The data is encrypted and cannot be changed like in a central system. To solve the problem of managing or updating information and knowledge in the product base and to improve customer transparency regarding products in various supply chains, this study proposes the establishment of product traceability. All product information is stored on a serial blockchain through an algorithm that regulates the operation of each part of the product and the information it stores. Additionally, there is an algorithm for retrieving data objects from the blockchain search. The results are expected to be important in improving food safety and increasing the competitiveness of suppliers. The overall goal behind management and integration is to provide customers with the level and control they need and complete the entire supply chain at low cost [1].

Chatbots are intelligent chatbots that can interact with users through natural language. Since chatbots can perform many tasks, many companies have invested significantly in the development and use of chatbots to improve various business processes. However, we lack critical reviews that comprehensively examine the cutting-edge and innovative uses of chatbots. In this review, we not only analyze the various calculations used to create state-of-the-art chatbots, but also examine the applicability and usage of chatbots in various industries. We also identify gaps in chatbot research and present new research to address gaps in existing research and practices. Our review reviews academic research and commercial applications of state-of-the-art chatbots. We provide guidance for practitioners to understand the full business benefits of chatbots and help them make informed decisions about the design and use of chatbots in various business areas. Chatbots are intelligent conversational agents that can interact with users through natural language [2].

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Quality control is required to check the product. Fishing supply chain. Carelessness with the product can lead to nutritional fraud, which can affect the health of the consumer. Monitoring and tracking the operation of fishing equipment can help stakeholders identify sources and prevent fraud and misconduct. Most of the current methods and technologies used to manage the fisheries supply process do not lead to compromise, accountability, transparency, trust, privacy and security. In this article, Author proposes a solution based on the private Ethereum blockchain to manage the fishing industry in a distributed, transparent, traceable, secure, private and trustworthy way. Author proposes a solution to speed up the process in the fishing industry and present five smart contracts. Author present ten algorithms with their successes, experiments, and proofs. Author performs security tests to demonstrate that the solution is both secure and reliable. We compare our solution with existing blockchain and non-blockchain-based solutions to demonstrate its benefits and innovation [4].

III. PROBLEM STATEMENT

Use of Chatbots for Modern Seed Supply Management Agricultural managers and service providers are realizing the need to improve their smart seed management by integrating chatbots. Key challenges of the current system include ensuring uninterrupted communication, providing important product information, maintaining product quality, simplifying the eight for registration, and providing customer support.

The aim is to improve communication and interaction with customers by incorporating chatbots into the system. The chatbot will allow users to quickly receive orders, access detailed information about products, and receive timely support for questions and complaints. Additionally, chatbots can help manage products properly and collect data to support informed decision-making. Therefore, the integration of this chatbot should improve the overall performance.

IV. PROPOSED WORK

The purpose of this project is to provide a system that will be more flexible. This helps to reduce the efforts of the user to find out the shops of seeds. This system provides a friendly user interface; by using that user can easily handle the system and find the shops easily. Our website will provide seeds to the local level to the farmers in the shortest possible time and all the information about which seed is available in which shop can be seen after logging in to our website by the farmer. So that the farmer is available for himself anywhere.

1. Check availability: Seeds can get out of order in the traditional system. Need to up from ate time to time
2. Complexity: It's very hard to go to shops to discuss the available seed, check for availability desired in upcoming days, and need to visit multiple times, with no any difficulty for getting information. Both as time consuming as well as harassing. The existing system is not flexible so there are problem-related to seed. The existing System depends on paperwork so it is difficult to handle, the purpose of this project is to provide a system that will be more flexible. This helps to reduce the efforts of the farmer and shopkeeper to find out the available places for the seed. This system provides a friendly user interface; by using that farmer can easily handle the seeds and shop Information. In Proposed System

USER: View product details only. The private sector has begun to play a significant role in the seed industry over the past few years. Currently, the number of seed or seed trading companies is estimated at 400 or 500. However, private seed production companies have focused more on seeds cereals, cereals and oil seeds are still managed by state seed companies. Private companies have a special place especially in maize and sunflower and cotton. However, in the case of vegetable seeds and horticultural plant material, the private sector is a prominent player. As the private sector has not been interested in getting into the production of wheat, paddy, other cereals, oilseeds and pulses, state-owned seed companies will continue to dominate grain, pulses and oilseeds among many others. years to come.

SHOPKEEPER: add stores and products on the website, the store owner runs small retail stores independently or with the support of small numbers from others. Record keeping and financial management the first step in training small retailers often involves helping store owners understand their financial status by keeping basic records. Generally, store employees are not shop owners, but they are often misrepresented. In lager companies a retailer is often referred to as a manager as the owner cannot manage the business by being a single seller so this term, can apply to large firms often and be a different function.

ADMIN: add stores and products to the website, the store owner runs small retail stores independently or with the support of small numbers from others. Record keeping and financial management. The first step in training small retailers usually involves helping shopkeepers understand their financial status by keeping basic records. Often, store workers are not shop owners, but they are often misrepresented.

In lager companies a retailer is often referred to as a manager as the owner can manage the business by being a single seller so this term, can apply to large firms (especially, multiple stores) in general and be a different function Designing a comprehensive system for Modern seed supply management using chatbot seed supply chain system requires careful planning and consideration of various components. The different modules are as follows: -

1. System Architecture: - This module will have a centralized, cloud-based architecture to enable real-time data access and updates. Modern seed supply management using chatbot.

2. Seed Inventory Management: - This module creates a database to manage seed inventory, including details like seed type, quantity, quality, and storage location.

3. Seed Quality Assurance: -This module will integrate quality control measures for regular seed testing and germination checks.

4. Information System: - Developing a user-friendly, web-based interface for farmers to access information about available seed varieties and local distributors. Using data analytics to provide insights and recommendations to farmers based on their location and crop preferences.

5. Sustainability Initiatives: -Encouraging and supporting sustainable farming practices, including organic farming and reduced chemical use.
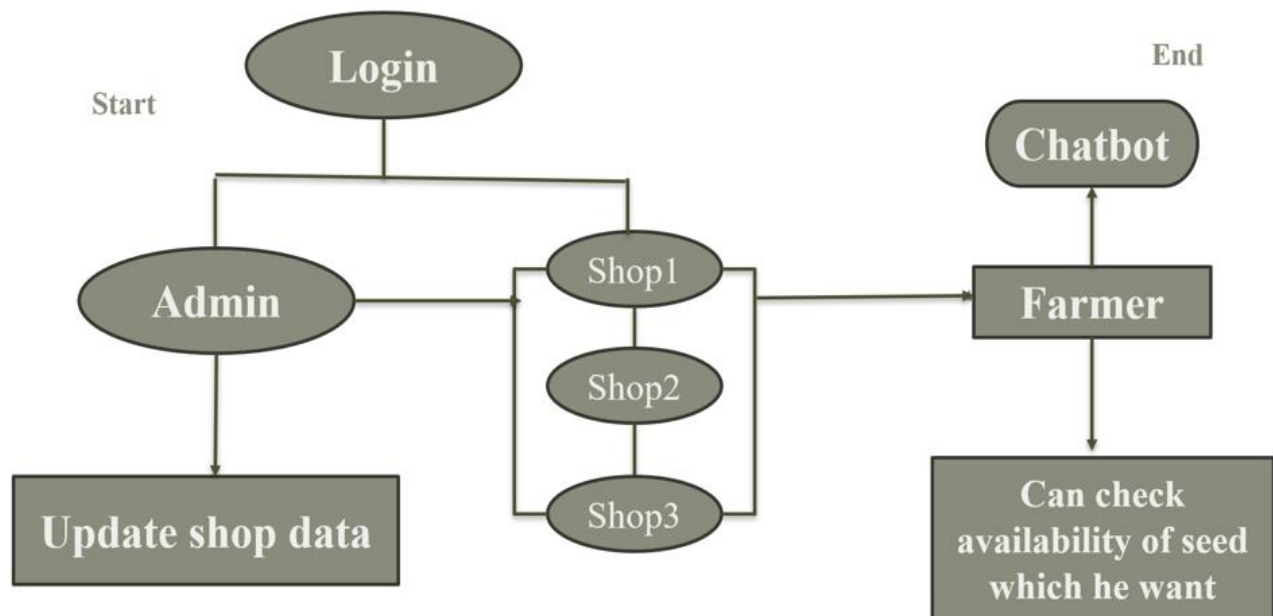

Fig 5.1 System architecture

This simplified flowchart covers the main stages in the seed supply chain management process, including seed production, demand forecasting, order processing, distribution, compliance, customer support, data analysis, and continuous improvement.

You can expand each of these sections with more detailed sub-processes and decision points as needed for your specific system.

V. RESULT
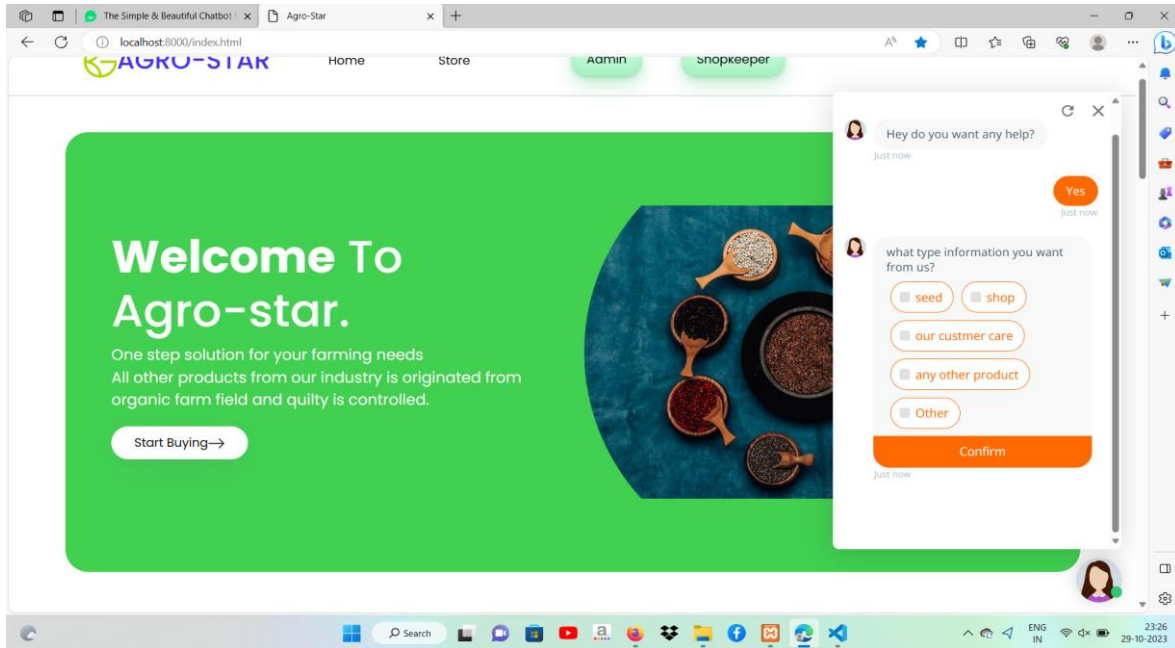
1)   Agro-Star Home page with chatbot icon

Fig 6.1 Home page with chatbot icon

This figure 6.1 refers the working of chatbot with home page, this chatbot is works like a other chatbot but some chatbot are not updated since some years and some months so it not give the accurate answers to the questions of a farmer but this chatbot updated values up to day which is very important and useful thing for the farmers and it gives the accurate answer information about seed data and shop data. Also, the chatbot provide the quality and quantity of the seed and gives the proper location of the shop which is main benefit the poor farmers which reduces their time as well as energy. Chatbot concept is one of the important concepts of the today's life so we are added this feature to the seed supply chain management system. Which is one of the main interface between farmer and shopkeeper with any interaction.
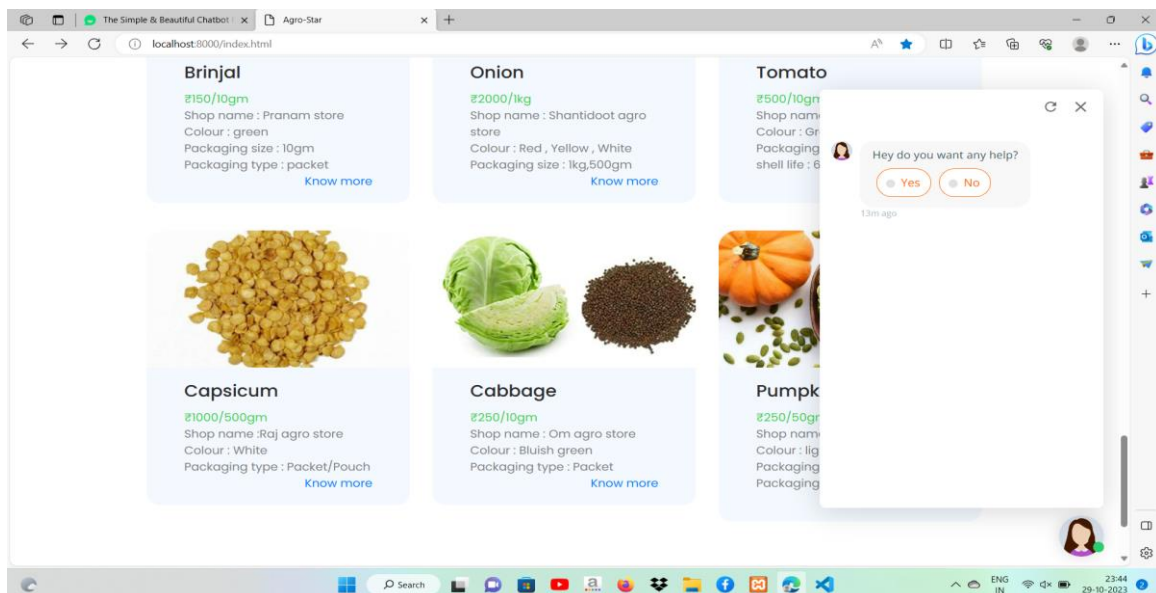
2)Seed data with chatbot search-box

Fig 6.2 Seed data with chatbot search-box

This figure 6.2 refers to seed data in available shop with all details like shop name quantity and price shop location and chatbot, which is really helpful for the farmers. It simply a making for a design purpose as well as the find the correct shop name. in this page "know more" button also added to find the correct information of the seeds and it direct visit to the Wikipedia page to know more information of that particular seed product available in that table.

This provides more flexibility to the famers as well as who are interested to doing seed work. This proactive approach ensures that seeds are always available when needed, reducing delays and minimizing waste in the supply chain. The result is a more resilient and responsive agricultural sector, poised to increase yields, improve farmer livelihoods, and contribute to sustainable agricultural practices. in conjunction with an advanced chatbot, is at the fore front of agricultural innovation, fundamentally transforming the way seeds are sourced and distributed.
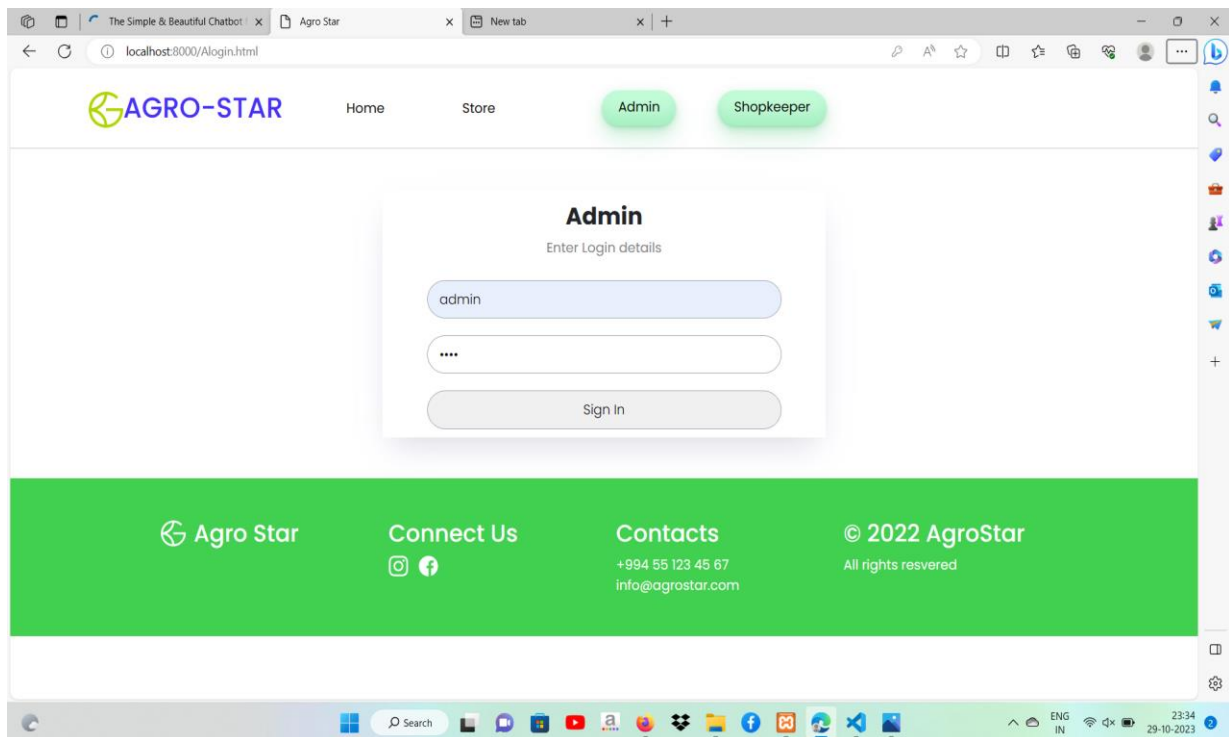
3) Admin login

Fig 6.3 Admin login

This figure 6.3 refers to admin login. It will helpful for the admin who manages the shop data where admin can add and delete the information of new shop and delete the shop data which was closed from the past days. Which also provides to the security to the shopkeeper as well as the admin and also admin can update its own details like username, password contact number which is same as the shopkeeper but at the shopkeeper login, It will helpful for the shopkeeper who manages the seed data where shopkeeper can add and delete the information.

Today a series of information-driven, integrated systems allow organizations to reduce the value of assets and costs, increasing product value, increasing resources, speeding up marketing time, and saving customers. The true measure of success in a supply chain is how activities work together with the supply chain to build the number of buyers while increasing the profitability of all links supply chain. In other words, supply chain management is an integrated system to generate the value of the end-user. Chains of supply of various agricultural goods in India, however, are full and challenges arising from existing problems in the agricultural sector.
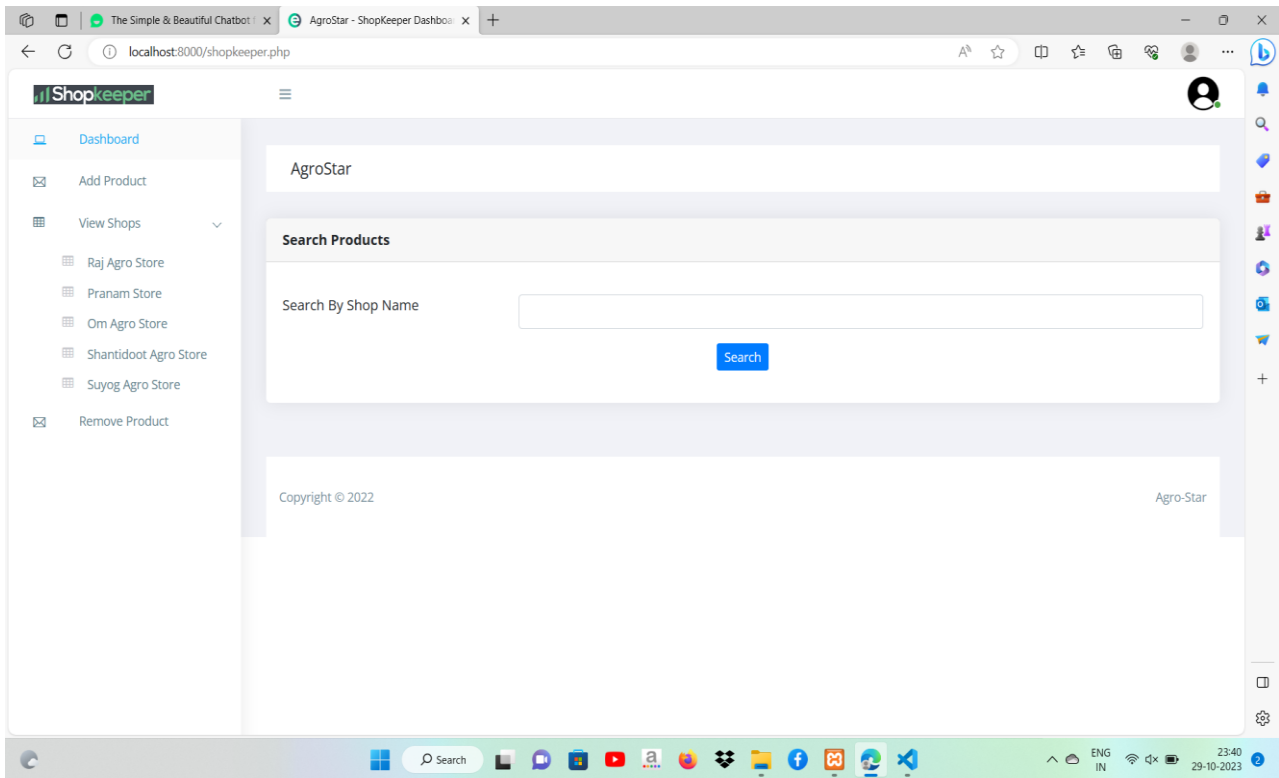
4) shopkeeper login page and seed data

Fig 6.4 shopkeeper login page and seed data

This figure 6.4 refers to seed login of shopkeeper and validation page. Including the dashboard of the seed shop name and their information which provides more security as well as the flexibility to our website visitors. Traceability is a big necessity in supply chain ventures, particularly for the agri-food industry. Building a product tracking system in a supply chain to enable the consumer and government agencies to track and know the source and origin of the product in an easy, safe and reliable way from tampering and provide the fixed system the just manager can approve accepted users that be trusted people because will add data that all world will see it for that in the system, we build an algorithm to generate the activation key for adding a client.

VI.   CONCLUSION

 The website created by us for farmers is very useful and the interface is very easy so that farmers can use it without difficulties we concluded that farmers can easily find information regarding Agro products on our Modern seed supply management using chatbot website. We provide an online home delivery service to farmers in the future. Home delivery seeds will be available to farmers through our website. integrating chatbots and AI into seed supply chain management systems offers a host of benefits to the agriculture industry. This technology has the potential to revolutionize how we manage the production, distribution, and quality control of seeds. A seed supply chain system is a critical component of modern agriculture, with both advantages and challenges.

This system offers enhanced seed quality control, traceability, and efficient distribution, facilitating the delivery of healthy and viable seeds to farmers. It ensures compliance with regulatory requirements, supporting the integrity of different plant varieties. However, implementing such a system comes with initial financial investments, the need for robust data security measures, and potential complexity in integrating with existing agricultural processes. To maximize its benefits, organizations and stakeholders must carefully plan and manage the seed supply chain system, utilizing technology and best practices to ensure its success. Ultimately, a well-implemented Modern seed supply management using chatbot can contribute to sustainable agriculture and food security by providing access to high-quality seeds for farmers worldwide.

VII.   FUTURE SCOPE

The future prospects of seed control in conjunction with chatbots are very beneficial and provide a path of change to simplify and improve all aspects of the process farm. Integrating chatbots into seed management brings the potential for efficiency, instant messaging, and improved customer experience. These smart communication tools can provide instant information about seed availability, price and ordering, facilitating interaction between stakeholders such as farmers, suppliers and distributors. Additionally, chatbots can play an important role in solving questions regarding seed characteristics, plant information and crop management, thus providing a better understanding of farmers. Using machine learning algorithms, chatbots can analyse historical data and provide recommendations, helping farmers make informed decisions about seed selection and planting. This energy forecast not only makes crops better, but also supports permaculture by encouraging economic savings.

Additionally, chatbots will improve traceability in seed supply, allowing participants to track seed from production to distribution. This transparency promotes accountability and quality assurance, reduces the risk of counterfeit products and ensures farmers receive quality seeds. Additionally, integration of Internet of Things (IoT) devices and sensors with chatbots can also provide instant information about the environment, soil health and crop performance. This knowledge-driven approach leads to efficient farming, allowing farmers to adapt their growth strategies to specific conditions, ultimately yielding the best results. Ultimately, the future of supply chain management lies in the integration of chatbots and new technologies. This holistic approach not only increases business efficiency, but also empowers farmers with knowledge, promotes sustainability and contributes to the overall development and resilience of the agricultural sector.

REFERENCES

[1] "Agro star: virtualization of seed supply chain management system", Anjali Dhane, Vrushali Shinde, shagufa tamboli, Sonali kachare (2021).
[2] "Design the tracing system for seed supply chain based on block chain", Authors: Ayat Abdul Hussain, Amir k hadi, Mohmmad Ilyas (2021).
[3] "A critical review of state-of-the-art chatbot designs and application", Bei Luo, Raymond Y. K. Lau, Chunping Li, Yain- Whar Si (2021).
[4] "Blockchain based traceability for the fishery supply chain", Pratushkumar , Patro Raja Jayaraman Khaledh , salah Ibarar Yaqoob (2020).
[5] "Smart Seeds: Enhancing Agricultural Efficiency through Chatbot-Driven Seed Management", John A. Smith and Emily R. Davis (2022).
[6] "Seeding Tomorrow: A Chatbot-Enabled Framework for Sustainable Seed Supply Chains", Maria T. Garcia and Samuel K. Patel (2023).
[7] "Conversational Seeds: An Intelligent Approach to Seed Information Delivery", Laura M. Johnson and Michael S. Kim (2021).
[8] "Chat Sow: A Chatbot-Driven Seed Sourcing Framework", by Robert J. Turner and Sarah E. White. Year (2022).
[9] "The paper Chat Crop: Improving Seed Quality Assurance through Conversational Interfaces", Danielle R. Adams and Christopher P. Brown (2022).
[10] "Seed Bot 2.0: Transforming Seed Distribution with Conversational Intelligence", Karen E. Anderson and Mark W. Thompson (2021).
[11] "Farming Futures: Chat Seed - Revolutionizing Farmer-Seed Interaction", Patricia A. Martinez and George R. Clark. (2023).