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Farmer Connect

Ms. Swathi C S[1], Brunda S[2], M Keerthana Maiya[3], B Lalitha[4]

[1]Assistant Professor, [2,3,4]Student,
Dept. of ISE, SVIT, Bengaluru

ABSTRACT :

The survey study "Farmer connect" offers a thorough examination of the rapidly developing field of speech technology specifically designed for the agricultural industry. It emphasizes how important different farmer chatbots are to modernizing and enhancing farmer-to-farmer communication within agricultural systems. The research explores the various functions that these chatbots can perform, including market analysis, weather forecasting, pest control, and crop management.

Keywords: voice assistance, Technology, leaf disease, detection, crop, buyer & seller

1. Introduction :

1.1 Background:

In order to improve agricultural practices and increase the overall efficiency of farming operations, voice-activated technologies are applied in the "Farmer Connect" survey study. The background information sets the stage for understanding how smart voice assistants have evolved in agriculture and how they could affect farmers. Among the background's principal

components are. Assertion of Smart technology in agricultural: Talk about the general tendency of using smart technology, such as data analytics, Internet of Things (IoT) devices, and sensors, to agricultural.

1.2 Objectives:

The aim of a Smart Voice Assistant for Farmers is to offer a cutting-edge and intuitive technology that supports farmers in several areas of their farming operations. Ensure that farmers can easily use the voice assistant, even those with little reading or technical abilities. The intention is to provide a broad spectrum of farmers with access to cutting edge agricultural equipment and information. Provide an overview of the advancements in speech technology, including natural language processing and voice recognition, and describe how these technologies have developed into trustworthy tools for human-machine communication. Furthermore, cooperative endeavors among technological developers, agricultural specialists, and nearby communities may facilitate the efficacious integration of intelligent voice assistants in the agricultural sector.

2. Related Work:

Several research work have explored the various aspects of smart voice assistance services and their applications in daily life. Jishnu U.K.'s four-wheeled robot has a robotic arm and a camera, as he describes in his paper [1] .The camera is used to determine distance, and the robotic arm is used to take images and arrange objects. One of their paper's shortcomings is that people need to be trained to operate robots. The technology that is based on a voice communication module with sensors and smart devices was contributed by "Nidhal Hadj," who introduced paper [2].One of their paper's shortcomings is that the system should always have access to the Internet if the power is turned off. "Using Raspberry Pi to develop virtual learning environments with integrated adaptive testing elements was suggested by Busisiwe N. Ncube[3] in his publication. The drawback is “it is essential to possess educational qualities”. Author “S.M Jaisakthi, P Mrunalini” in paper [4] “Grape leaf disease identification “proposed an automatic system for detecting the disease in the grape vines using image processing techniques and machine learning technique. Drawback is it is not capable of recognizing the all type of diseases. In his article [5] titled "AI based Voice assistant," author Subhash suggested a system that can comprehend user requests. Drawback is it requires internet connection. Author “Kiruthiga” in his paper[6] “ Farmers assistant using AI voice bot” developed an mobile application with two sections voice bots and suggestions bot . In voice bot farmer can ask query with the mic of his phone, suggestion bot in order to give suggestions of crop to be cultivated and fertilizer to be used . Drawback is it requires internet connection. Author “ JianshengLiu” in paper[7] “ Intelligent personal assistant robot “ proposed a system which speaks with people , tell jokes , sings and dances forpeople , understand the owner and recognizes the people .Drawback is it is less accurate.

In the work "Plant disease Detection using ML techniques,"[8] author "Shima Ramesh" described the methods for determining the health of a leaf. The longer processing times for images are a drawback.

3. Proposed Work

We have integrated a function for recognizing leaf diseases in this project, along with voice aid in the native language of Kannada. Furthermore, in order to protect farmers from middlemen frauds, we have created a market module where they may purchase and sell their goods. A feature that makes it easier for farmers to manage their stock and sell it at the best time is the ability to find cold storage facilities in the area in which to store their harvests. This initiative makes sure that farmers that utilize this website will benefit and make money.

4. Methodology:

4.1 Leaf Disease Detection:

The first stage in detecting plant leaf illnesses is to gather a collection of photos that accurately depict real-world situations and include both healthy and diseased leaves. Through methods like data augmentation and normalization, noise and unnecessary information are eliminated from the gathered images during the preprocessing stage. Convolutional neural networks are usually chosen as the model for this job (CNN). The model is then trained on the training set while being observed on the validation set once the dataset has been divided into training, validation, and testing sets. The model is assessed on the testing set to determine its accuracy and precision after training. Optimization strategies like data augmentation or transfer learning can be used to the model if it is not operating at peak efficiency.

4.2 Voice Assistance:

Speech recognition is one of several important steps that are needed when translating spoken language into writing. An audio signal is recorded and processed as part of the speech input process. After that, relevant properties from the audio stream, like spectral information, are extracted to represent speech in a process called feature extraction. The acoustic model then interprets these attributes and transfers them to phonetic units to determine the most likely sound sequence. The language model considers both context in a given language and the likelihood of word orders. These two models collaborate to offer a set of possible transcriptions. To generate the text output, which is the conversion of spoken words into written language, the transcription with the highest overall probability is ultimately selected.

4.3 Market Info:

Farmers lack the information necessary to make wise decisions about production, manufacturing, and selling in order to increase their profits. Different non-governmental organizations (NGOs) and for-profit businesses have devised strategies to provide farmers with information regarding market prices, crop advising services, and farming techniques in an effort to reduce poverty. We look into a crucial query: would farmers benefit financially from information? We build a stylized model where farmers have to decide what to produce before the market price is realized, given an unknown market price (demand).

To determine the true market price, each farmer has two imperfect signals: an imprecise private signal and an imprecise public signal.

4.4 Seller:

In order to build an online platform that would enable direct communication between farmers and customers without the involvement of a third party, the website "Farmer Connect" is being proposed. We created a range of languages that are appropriate for farmers, including Tamil, English, and Telugu, so that they could publish and sell their farm products straight from the fields. This web portal can address the issue with the current system by increasing the effectiveness of online page access and fostering a direct line of communication between farmers and consumers. For the farmer, there is a unique login page.

4.5 Buyer:

The customer registers with the appropriate information in this module. He gets taken to the login page after completing the registration. He must first fill out the portal's registration form with all of his information, including his address, bank account information, and login. He gets led to the homepage after logging in, where he may see every product that sellers or farmers have submitted and purchase it in the quantity of his choice.

4.6 Cold Storage:

Less often accessed data that doesn't need to move as quickly as warmer data is referred to as cold data storage. For months, years, decades, or maybe forever, information that isn't being used now may not be used at all.

4.7 System Architecture:

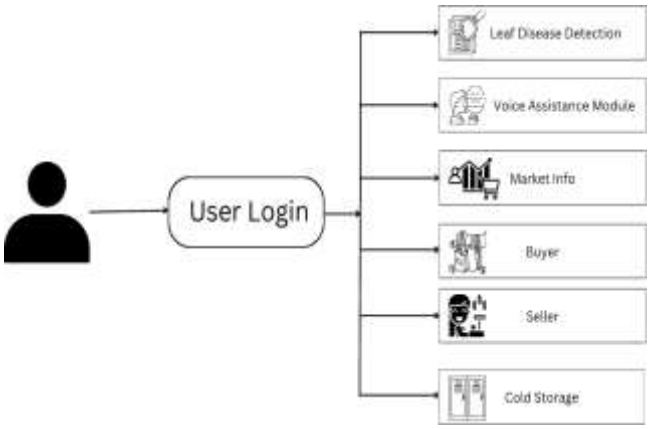

Fig 4.1.1 System architecture

5. Advantages & Disadvantages:

5.1 Advantages:

Efficiency: Smart voice assistants can help farmers streamline tasks by providing quick access to information, weather updates, market prices. This efficiency can save time and effort.

Hands-Free Operation: Farmers hands are usually occupied with a variety of duties. Voice assistants facilitate hands- free functioning, enabling farmers to access information or manage gadgets without interrupting their tasks.

Accessibility: People with poor literacy or trouble using standard interfaces may find voice interfaces to be more user-friendly. For a wide variety of farmers, this inclusivity is advantageous.

Real-Time Data: Farmers can receive real- time updates on weather conditions,

crop prices, and other critical information, helping them make timely and informed decisions.

Automation and Control: By integrating smart voice assistants with other smart devices and technologies on their property, farmers can use voice commands to operate irrigation systems, machinery, and other equipment.

5.2 Disadvantages:

Cost: Implementing smart voice assistants and related technologies can be costly. Many farmers, particularly those in developing regions or with smaller operations, may struggle to afford these investments.

Reliability: Voice recognition technology may not always be dependable, particularly in noisy environments or with diverse accents. Misinterpreted commands could result in errors or misunderstandings.

Dependency on Technology: Relying heavily on technology, including smart voice assistants, can make farmers vulnerable to disruptions caused by power outages, technical malfunctions, or network issues.

Learning Curve: Some farmers, especially those not familiar with technology, may encounter a learning curve when adapting to smart voice assistants. Training and support might be necessary for successful implementation.

Data Security and Privacy Concerns: Smart voice assistants gather and analyze data, which raises concerns regarding privacy and security. Farmers should be mindful of potential risks such as data breaches or unauthorized access to sensitive information.

Limited Customization: Voice assistants may not comprehensively grasp the specific needs and terminology of every farming operation. Customization options could be restricted, which may diminish effectiveness for some users.

6. Conclusion:

This survey report on "Farmer Connect" offers an in-depth analysis of the state of affairs, obstacles, and possible ways forward for using voice assistant technology in agriculture. A thorough examination of the literature and technology now in use has revealed a number of important discoveries. It's clear that using intelligent voice assistants in agriculture has a big potential to change how farmers run their businesses, get information, and make decisions. Farmers may have better accessibility, receive real-time updates, and have difficult processes streamlined with the help of the voice-driven interface.

The difficulties found in the survey—such as communication gaps, poor connectivity, and the requirement for personalized content—emphasize how crucial it is to provide voice assistant solutions that are tailored to the particular requirements of the farming community. It will be imperative to address these issues if we are to guarantee that these technologies are widely adopted and effective in a variety of farming contexts.

The significance of taking into account regional variations in socioeconomic origins, cultural quirks, and technological infrastructure is also emphasized in the research. A one-size-fits-all strategy is not likely to work, so smart voice assistants for farmers need to be designed with greater subtlety and context in mind. There are a lot of prospects for study and growth in this field in the future. The development of multilingual and culturally aware interfaces, improving the voice assistant programs currently used in agriculture, and addressing the unique needs of various crops and farming methods. The successful integration of smart voice assistants in agriculture can also be facilitated by cooperative efforts amongst technology developers, agricultural specialists, and local populations.

FURTURE ENHANCEMENTS:

The Farmer Connect voice assistance feature may be restored in the future in other languages, such as Hindi, Tamil, Telugu, and so on. We have done work on the Kannada language thus far.

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