**INTRODUCTION**

Blockchain an open, disseminated and decentralized ledger that evidences transactions involving two parties capably in a confirmable and stable way (Iansiti, Lakhani 2017). In the above given definition, open means the blockchain is accessible to one and all, disseminated means that there is no single party control and decentralized means there is no central third party available, capable means it is fast and more scalable than the conventional technologies, confirmable means that everyone can check the validity of the informat ion and stable means that the data is nearly immutable that is it is nearly impossible to change or tamper the data or information. They verify and validate the identities and chronological events. They guide every action, transactions that have taken place among individuals, communit ies, organizations and nations as well. In this era of digitizat ion, the way maintained and regulated these type of data must be changed, it must be highly secure and the blockchain is the solution to this.

In the era of information and communication technology, a farmer's portal has always been helpful for farmers in many ways, providing ease of use and convenience of information to the farmers [1]. The Government of India has also taken many initiat ives for the same. Few examples of such portals are Krishijagran.com, farmer.gov.in, agricoop.nic.in and agriwatch.com etc. Apart from these some E-commerce websites are also available; fert.nic.in and enam.gov.in etc. The sectors currently using blockchain are shown in Fig.1.Using blockchain technology in the field can make available decentralized computation and informat ion sharing platform that enables multiple authoritative domains, which do not trust each other, to cooperate, coordinate and collaborate in a rational decisionmaking process, a reliable informat ion recording s ystem can be made that can contribute for the development in the

agriculture sector. Since blockchain works like a publicledger, so it can be utilized to ensure many different aspects

such as [3]:

● Protocols for Commitment: Ensure that every valid transaction from the clients are committed and included in the blockchain within a finite time.

● Consensus: Ensure that the local copies are consistent and updated.

● Security: The data needs to be tamper -proof. Note that the client may act maliciously or can be compromised.

● Privacy and Authenticity: The data or transactions belong to various clients; privacy and authenticity need to be ensured.

Cryptography is a foremost part of the functioning of blockchain technology [4]. Public key encryption is the root of blockchain wallets and transaction, cryptography hash functions endow with the trait of immutability and merle trees systematize transactions while enabling blockchain to be more competent.

Ensuring the above aspects numerous work has been carried out in the field of blockchain. The presented portal is a contribution over them. It can help to maintain a secure platform for farmers, where they can trade with the customers electronically. The main object ive of this study is to record the secure transactions between a seller and a buyer that ensures a contract between the two. This can help farmers to get a legitimate price for their commodity. The system also facilitates a single place to record the whole trade transaction.

The availability and accessibility of information are the crucial points in taking the optimal decision at right time. Nowadays, advancement of ICT make possible to retrieve almost any information from the global repository (internet). The information in internet is primarily maintained in English. So, a large number of people are deprived from the benefit of internet due to technical and English language illiteracy. This scenario is very bad in developing country like India where nearly 76 % are English illiterate 1 . Moreover, a large percentage of the English literate people are also unable to find their exact need form the large database of internet due to lack of proficient knowledge in English. Indian farmers belong to such type of people who are not much sound in both technical as well as in English.

So, they are unable to access required information on the farming life cycle, seed selection, pesticides, market price etc. from the internet. As a consequence, they are not capable to take optimal decisions at different stages of farming life cycle, which make huge impact on the farmer’s revenue. As a result suicide rate has been increased rapidly among the Indian farming community. According to the reports, those pathetic incidents are mainly happened due to the frustration that they are unable to pay their debts. These types of situations create huge impact on the agriculture sector. Consequently, the focus of new generation is shifted from farming sector which will be threatening the near future in India. Our preliminary studies reveal that farmers require information at the right stage of the farming life cycle to take the right decisions [1]. However, farmers are unable to get this information from internet due to English language and technical illiteracy. Recently, some webpages like –Wikipedia, Indian Railway web page, etc. provide facility of internet access in many users’ language other than English by supporting UTF-8 encoding3 . However, it is observed that information is not so useful to the people who are having poor knowledge on internet and web browsing [2]. Moreover, this type of attempt is meaningless for the illiterate people. A large number of people from the Indian farmer community are unable to read/write even their own mother tongue. So, it is obvious that text based interface, instead of supporting farmer’s own language, are not able to provide the required information. The above mentioned scenario states that there is a requirement of alternative interaction technique(s). By considering this fact, Plauché et al. proposed a speech-driven agricultural query system for Tamil Nadu state of India [3]. However this work does not able to address the scenario of total India. Patel et al. designed an interactive voice application for small-scale farmers in Gujarat, India [4]. However, it doses not provide a feature to search for specified content in the forum. There, user needs to answer the questions sequentially starting from the most recent question. User does not have the option to skip any question. Moreover, there is no guarantee of giving accurate answer, as the questions are answered by other users. Furthermore, this work is also confined to a particular area of India. In some recent efforts, expert system based text animation has been proposed for diagnosis of most common diseases occurring in Indian mango [5]. This work also uses picture based system alongwith the text query for easier understanding of the disease symptoms. Though, it is a good initiative for Indian farmer, but limited to a particular fruit. Another notable work was mobile based multimedia social networking platform – GappaGoshti for information and advice exchange, proposed by Lobo et al. [6]. Ramamritham et al. [7] design an online multilingual, multimedia based forum for common man of India. However, those forums and social networking platforms provide limited number of information as compared to the internet. Moreover, quality of information may not be up to the mark, so illiterate people are unable to get any information from there. To overcome the limitation of illiteracy, Samanta et al. [2] proposed and multimodal interface for the Indian common man. However, the iconic module of this work is not related to the agricultural domain. Other works [8, 9] also highlight the need of a systematic approach which is required to provide the precise information to farming oppurmmunity. Moreover, not only providing of the information to farmer, it is also essential to identify that how the farmers are motivated toward accessing the information [10]. All the aforementioned observations motivate us to conduct in depth research toward making an interface for Indian farmer community, which will be more useable, systematical, and needful for them irrespective of language and technical proficiency. Here, we propose an iconic interface integrated with a text to speech (TTS) engine to access the agricultural information from the internet’s global repository for Indian farmer community. Further, we also integrate a local repository with the interface to access urgent information without connecting the internet.