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A Study on Block Chain Technology in Agriculture Field

C. J. Srinivedha[1], Ms. R. Sarala[2]
[1]*M. Phil., Scholar, Department of Computer Science, KG College of Arts and Science.*
[2]*M.C.A., M. Phil., (Ph.D)., Assistant Professor, Department of Computer Science, KG College of Arts and Science*

Abstract: ***Now-a-days population grows rapidly it leads to scarcity of food so, developing environment has led a path in smart Agriculture. By using Sensor, Drones etc., and reduce the human work in farming field. But in rural areas network connectivity and continuous progress in network plays a major issue so to solve this issue we introduce Block chain technology in farming field for land preparation, crop yielding, watering the plants, for pesticides, even harvesting. To monitor all these process from where ever we are and giving commands or instruction to devices through smart phone or tab we have on our hand. We can control and give instructions from home and where ever we are using RFID and for continuous progress of process and analyse data and generate the report using Block chain technology.***
Keywords: Block chain, machine data, traceability, farm processes.

I. INTRODUCTION

In the twenty first century the world population goes on peak it leads to scarcity for food's raw material so development of new technology leads a path in automatic farming we can control farming device from where ever we are and command the device to perform the process that is assigned to the device from where ever it is under geographical meridian. The process such as field for land preparation, crop yielding, watering the plants, for pesticides, even harvesting can be monitored and controlled using block chain because it can control even the power supply is off state because it's a device to device communication process.

II. BLOCK CHAIN IN FIELD OF AGRICULTURE

Using block chain technology agriculture process goes on smoothly, each keeping a food supply chain on demand the process is connected on network it means drones and tractor are connected using device id and track the device and the process goes on smoothly [1]. Small hold farmers are also gets benefited using the smart agriculture process using Block chain technologies' benefits for farmers might be dependent on the size of the farm. On the one hand, smaller farms could easily participate in a block chain-based production on market. In this smart agriculture, we use Block chain technology for network connectivity control the drones and tractors from where ever we are each and every and control the devices without lack of network for the following process such as, Land preparation, Crop yielding, maintaining soils water level, Pesticide for plants, Harvesting [6]. On the opposite hand, grouping and desegregation on farm knowledge and smart electronic device usage knowledge could be additional convenient for large farms. Thus, further research should try to anticipate which farms could benefit an which could lose from the introduction of block chain-based solution [2].

Figure 1: Analysis of data in field monitoring

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A. Detection of Aerial Device

In farming field, we use block chain technology an farming field we use unmanned aircraft system (UAS) consists of the unmanned aircraft and its associated communication links and control components required for its safe and efficient operation that's performed like land preparation, crop yielding, watering the plants, pesticides, finally harvesting can even from homes and where we are around the geographical position around the world [3].

Drones network control in legacy IoT architectures is typically centralized where IoT devices upload data to the cloud through nearby gateways. In this process IoT acts as gateways only act as relay nodes that forwards data and stores them on centralized servers. during this section, maintenance drone operations in legacy IoT networks Drones bring numerous advantages in controlling areas that are difficult to achieve . However, despite these advantages, identity validation of a drone assigned a maintenance mission isn't simple and gets even more complicated with the increasing number of drones and IoT devices. This motivates the need for autonomy and decentralization using Ethereum block chain technology to transform the centralized IoT architecture into a decentralized network that provides security, trust and autonomy [4].

III. PROPOSED MODEL FOR SMART AGRICULTURE IN BLOCK CHAIN

A block chain network is deployed between the RSUs and thus the drones. A snapshot of registration mechanism. aged by the block chain centre, which during this case is taken under consideration to be the a neighbourhood of ground core network. during this technique , every entity, which may be a component of the block chain network. It contains a 20 Byte address, through which it can store/retrieve its information to/from the block chain. The block chain network is used to share the authenticated information of the registered entities once they get registered by using the next mechanism as for the registration purpose, multiple functions are designed, collecting the knowledge related to different entities as an input and mapping it against the block chain address associated with each entity. Once the knowledge gets on to the block chain, each entity, which is connected to the block chain, can access this information and should verify the source of the knowledge . B. Registration and Authentication Process of RSUs, Drones and SVs as we are using the concept of the block chain for our registration and authentication process, a wise contract is required to interact with the block Chain during a classy manner [3]. For this reason, a wise contract is supposed with several functions for the registration of SVs, drones, and RSUs, which involve storing data on the block chain. It also includes functions for the authentication.

1) *Registration Process:* In this process we use three main functions of the smart contract, which correspond to the registrations of drones, the rationale of designing three different functions separately in smart contract is that each entity contains different set of knowledge associated thereto . As defined within the system model, each entity is taken under consideration to be the a neighborhood of the block chain network, where each entity has the 20 Bytes unique address associated with it on the block chain network. The function used for the registration of the drones takes the ID, which is required for the identification of the parent-drone or the child-drones, and allows flying code of the drone as an input, which is mapped against the block chain address associated to the drone [4]. Similarly, for the RSUs the function only takes the deployed area of the RSU as an input and stores this information against the 20 Byte address associated to RSU. Moreover, the smart contract is supposed in such an intelligent way that only the C&C can register these entities by making transactions on the block chain to update state variables associated to each unique address. just in case that the transaction isn't made by the C&C, the transaction is turned down without registering any entity on the block chain. additionally , the entities connected to the block chain update their block chain storage and permit information, which comes from the trusted authority [4].
2) *Authentication Process:* The SVs request for the authentication by providing the unique addresses associated to them. If the addresses is within the list of the registered vehicles addresses, which is verified by the block chain, then they're authenticated and allowed to use the resources. On the other hand, we've the available RSUs and drones, before utilization of these entities to provide the resources to the users, authentication must be done [5]. Available RSUs and drones provide the unique 20 Bytes addresses associated to those entities during a uniform manner as provided by the smart vehicle. These entities get authenticated, if the addresses associated to them gets a match with provided registered entities from the block chain by using the choice function designed within the smart contract for these two entities. The block chain algorithm rejects the request to protect the system from unauthorized and malicious entities [8]. The Proof of Work(PoW) function in block chain algorithm deals with working function on the world monitoring and controlling the work done from where ever we are using this block chain technology. Work on monitored and using Proof of labor and thus the stack work is maintained using Proof of Stack(PoS) Function.

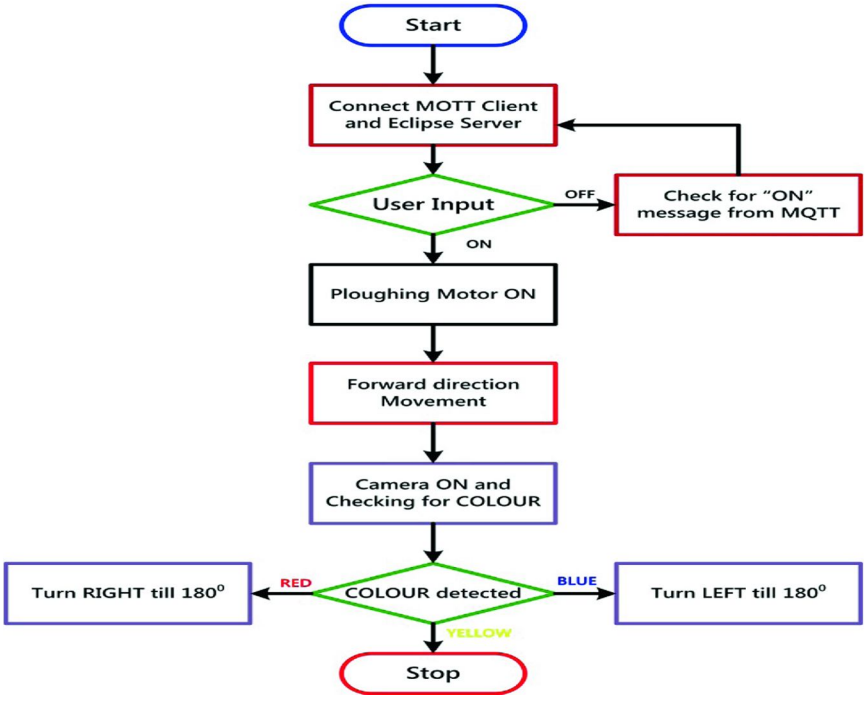
IV. DIFFERENCE BETWEEN BLOCKCHAIN, AND WIRELESS

Sensor Network (WSN) and Radio Frequency Identification (RFID)

BLOCK CHAIN TECNOLOGY	WIRELESS SENSOR NETWORK (WSN)	RADIO FREQUENCY IDENTIFICATION (RFID)
It has Improved traceability.	It has high Traceability over sensors and devices.	It Eliminates Human Error.
It has Increased efficiency and speed over devices.	It Useful to society because sensors are easy to handle, understand easy by all.	It Increases Operational Efficiency.
It controls the digital traffic and also can manage infrastructure level traffic within network routing.	In real life in urban areas network management and controlling data becomes very difficult but it helps in reducing Cost.	It consists of tiny transponder, a radio receiver, transmitter and shows pulse rate from a nearby reader device and helps in reducing a Costs of process.
It is Decentralized so we can monitor from where ever we are.	It is a Pubic network so any one can control.	It is Local network so any one can control using the ID number.
It is a Device-to-Device communication.	It is a Device and Sensor communication.	It is Communicates through radio frequency identification number.

In the above table displayed it shows the difference between the network in shown. We use Block chain technology in order its greater transparency in rather than others where as in wireless sensor[2] if sensor fails we cannot continue the further process and even in RFID if any device fails or connection doesn't get established at a stretch the continuity stop for further process following by, in Block chain technology security is very high compared to others, traceability of device from one place to other and we can control and give command from our smart phone to that particular device and command is transferred very fat and in very secured manner it reduced cost rather than others. Drones network control in legacy IoT architectures is generally centralized where IoT devices upload data to the cloud through nearby gateways. It Grants Access to Real-Time Data. The block chain by using the call function designed in the smart contract for these two entities. In contrast, if the provided address does not match, then the block chain rejects the request to protect the system from unauthorized and malicious entities [2].

V. FLOW CHART FOR CONTROLLING DEVICE AND ANALYZE DATA



Flow chart for controlling and analyse the data

In the flow chart above Initially we check for the state of the device by connecting the device through our smart device we have in hand and connect to the motor (MOTT) and controlling and moving the deice in order to plough the farm field the movement of device takes place in forward direction the process done is monitored using camera that is placed on the device according to the colour detected on our devices and once the device reached the end the particular line the device is turned to right or left direction of our field by detected colour until it reaches 180 degree once the process gets completed the process gets terminates[8].

VI. CONCLUSION

In this paper, we have proposed a drone-aided smart agriculture by employing block chain technology and by placing the drones optimally in a geographic area[4]. The block chain is integrated to build mutual trust between different entities of the network and to protect the network from external intruders, who can be malicious. This paper at the single point of failure of drones and other connected we can retain the process and continue the process from where we are and process the commands, control and operate the machine through our smart phone we have in hand the only thing is that the farmer should know to handle the smart phone and analyse the data transmitted on distributed nature of the block chain.

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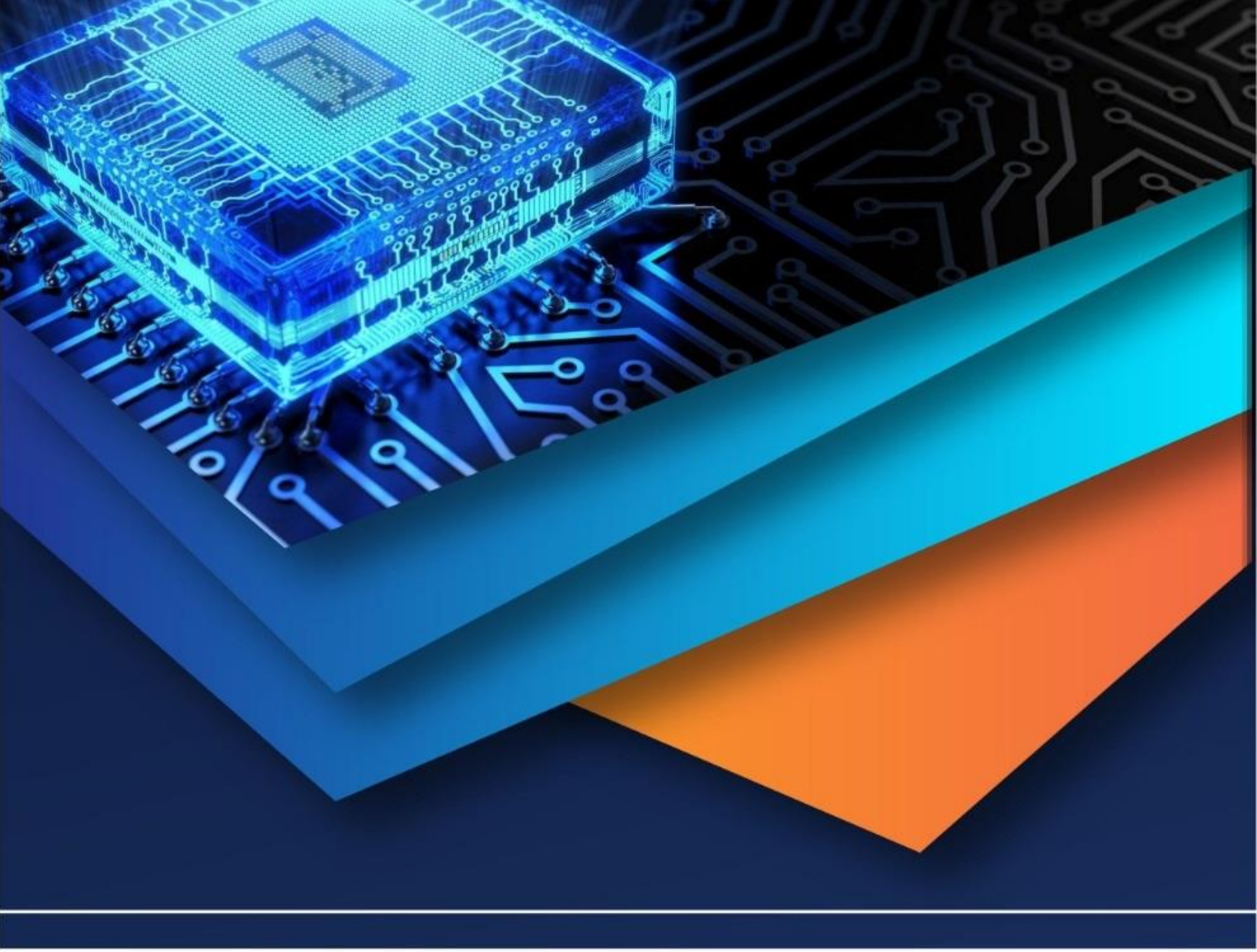

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