Designing A System For Identification And Reckoning of Livestock

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Abstract- *The ecosystem around us is being industrialized with the advent of new technologies. This project was aimed at creating a framework for tracking the animal's behavior. It is essential to automate the system in order to increase efficiency as agriculture is a primary sector of the Indian economy. A typical farm usually requires a lot of work. This system allows for efficient monitoring of the farm using the appropriate technology. The use of this system helps to reduce manual labor and thus facilitates and accelerates the work. This method can increase the growth of agriculture. To improve productivity, the concept of livestock monitoring can be extended to farmhouses. It is possible to automate several aspects of the farm, including auto-irrigation cycles and safe temperature-controlled enclosures for livestock and agricultural products. Currently, all sheep are counted manually by the time-consuming tally clerks. In the ports of embarkation and disembarkation, sheep are counted several times. The fundamental point of the task is to reduce labor, time management, proper use of resources. The use of RFID cards here is to monitor and control the sheep's activities.*

Keywords- Arduino, Internet of things, Load cell, Raspberry Pi, RFID cards.

I. INTRODUCTION

The livestock subsector makes an enormous contribution to the economy of developing countries, especially in the provision of food to the growing human population, the supply of raw materials to the industrial sector, products(AGDP) and around40% of global GDP, and serves as the fastest growing agricultural market, a major food contributor and a critical source of employment. The animal husbandry sector involves the livestock sector, the dairy sector and the fisheries sector are significant industries. It plays a major role in the country's national economy and social economic development. In the rural economy, it also plays an important role in supplementing family income and creating productive jobs in the rural sector.

Indian livestock industry is responsible for a significant amount of animal resources in the world.

India's livestock exceeds the function of food production. Livestock is an important source of crop manure and domestic fuel. It is a source of minimizing non-renewable energy consumption. Livestock, a major source of income for farmers and poor rural people. However, demand for livestock and livestock products is growing rapidly in developing countries, which is seen as a revolution in the field of food. Livestock products are expensive in terms of staple foods, and the level of consumption of developing countries is still low, but increases with rising incomes. But consumption growth is at the expense of increasing net imports of all animal products. Increasing production and higher self-sufficiency would therefore save foreign currency. In addition, livestock production contributes enormously to farmers ' rural livelihoods and poverty alleviation. A rancher or herdsman's most important and repetitive task is to count their herd to produce a headcount in order to determine the availability of livestock. It's a task that takes place every day, once a day. The system is designed to be as user-friendly and as affordable as possible to purchase in an effort to make this invention a basic and viable tool for any rancher or herdsman with a medium-sized herd on up to the largest herd. Usually an automated herd counting tool is not cost-effective with a small operation for the rancher or herdsman. As animals come and go in their daily routine, they are counted as they are close enough to the counter. Instead of driving into a pasture or field and interactively counting a herd, a rancher or herdsman could drive through the counter location, such as a water tank, and check the counter's current water mark. If the amount displayed is less than the established headcount, the rancher or herdsman can either do a manual headcount or test the counter later in the day and relay a headcount from a remote operating system.

II. LITERATUREREVIEW

[1] In this research, they built an automated monitoring system focused on wireless communication networks throughout dairy and pig farms to replace traditional manual data collection of environmental conditions and manual regulation of fans and water control valves in livestock farms to solve the problem of manpower shortage in livestock farming. Next, sensors are mounted to sense temperature, humidity,

illumination, wind speed, control circuit and communication network. The monitoring programs were subsequently designed to transmit the data back through RFU-400 wireless communication modules to the office's user interface display, and the data collected from the farm environment were stored in a data analysis database. Eventually, to increase the temperature and humidity of the livestock farms, the fans and water spray valves are triggered automatically. We evaluated the lactation yield data collected from the sensors for dairy cows and recommended improved environmental parameters for dairy cows to increase their appetite and lactation yield or to increase the pigs feed conversion rate. We expect the process and results of this study can result in helpful reference to livestock farming and help to achieve the best economic benefits in raising cattle, pigs and so forth.

[2] For rural areas, farming is the main source of income. Animals such as horse, donkey, sheep, goat, and so on play a major role for rural life. We are used as an income source. Animal husbandry therefore becomes a major concern. This paper demonstrates Internet of Things technology for farmers. Using variables such as temperature, humidity, and pulse, they use sensors to gather and transmit data and then pass it to the Arduino Uno. The Arduino Uno receives the sensor data and appropriately transmits the output. The gsm Sim module will transfer the data to the website of monitoring. All software modules and sensors are interpreted through the computer monitor, which utilizes the global positioning system to track the current status and location of the dog.

[3]The paper describes an alternative method to weigh and monitor the health of livestock by means of British Standards Institution (BSI). For weighing each livestock onto the weighing scale, the farmer manually has to lift each livestock using rope which in turn increases the risk to injure both the farmer and the livestock. The purpose of this paper was to intensify the process of weighing the livestock inventing a weighing scale which is long lasting, easy to maintain and equipped with the database to store the weight of the livestock for the purpose of monitoring them. The hardware typically consists of load cell, HX711 and Raspberry pi as a main controller of the system and the software used is python programming language and LAMP to store the obtained data.

[4] This paper highlights on the blynk IOT platform to control and monitor the farm from anywhere using internet. In this, the prototype was developed to measure the humidity in the paddy bags located anywhere within the warehouse so that excessive humidity can be prevented as it is the main cause of paddy rotting. The blynk server receives the data from the sensors that are installedin each bag and the blynk application displays/notifies all the data that is gathered by the server in a timely manner example humidity, status of each sensor installed. The blynk notification is also sent if any of the device is disconnected from the system.

[5] This paper is based on the monitoring the cattle's health using wireless networks. The constant killing of diseases in cattle such as foot and mouth disease (FMD)hinders farmers condition which directly affects most developing countries national economies. To address these diseases, farm science technology must be implemented to monitor dairy animal health in order to reduce the cost of production. The role of sensors is to collect disease data and to reduce the cost of healthcare for long-term animal dairy. Farm automation using WSN controls the temperature of the body which plays a significant role in detecting animals' ill health. Directional antennas use transducers to monitor immediate sudden changes in the animals' body. Cattle monitoring system and related issues have been mentioned in this journal. It is therefore important to use WSN to monitor animal health in order to identify diseases early and reliably and prevent them from spreading.

[6] This article presents a framework of rational management and regulation of animal production that is highly intelligent and broadly accessible. This device mainly provides tracking and control functions for feed use, identification of RFID e-labels, traceability of performance, monitoring of the animal farming climate, monitoring and prediction of production, etc. This article provides a detailed guide to the monitoring of the animal farming environment, the monitoring of development and the algorithms used by the system's prediction method. This system effectively increases animal farming production efficiency as well as animal product longevity and off-taking levels, thereby shortening animal farming cycles. This system provides a convenient platform for standardized livestock production and management. Animal farming in multiple locations and for multiple times finally generate big data of farming of various types of animals. Constant exploration of such data can help optimize animal farming practices and provide technical support for more science-based and precise animal farming. The smart animal production management system implemented in this article can execute smart animal farming management, reduce the number of staff, shorten the farming process, and track farming costs and farm animals in a science-based and automated way.

[7] This paper suggests a system which monitors animal condition which incorporates technology such as RFID to identifies animals depending on the label data added to their bodies, sensor nodes that detects animal body temperature, and GPS (Global Positioning System) which locates the animals and their cages. All data from the technology are

stored in the database and subsequently provided to users. A pet care system that involves a smart pet gate and a smart pet feeder is discussed in this journal. The care network has improved animal tracking and also satisfies pet owners ' specifications. This paper also provides a process of thinking about future work and improvement to centralize the study of the IOT gateway and detect animals at a distance. Sensors attached to the body of the animal have the ability to monitor the animal's body temperature and health. This helps to identify whether the animal is sick, sick, or fit perfectly. Actions can therefore be taken to improve their health. With the help of attached RFID tags embedded with sensors, tracking animals within the area / zone as well as outside (with GPS) is very easy. These sensors can be used to know their body temperature and their health conditions. As it is necessary to take care of every animal. In this project it is possible to diagnose remote monitoring, feeding, body temperature analysis and other health disorders with IOT.

[8] The continuing hunt by companies operating in the livestock sector for performance and productivity, stemming from growing fierce competition and more nuanced flows. RFID is an obvious tool in this sense to create value along the supply chain. These integrated systems deliver double benefits of decreased labour costs due to automation and increased profits to livestock efficiency, health and welfare management. However, for small-scale livestock farmers, RFID-based systems may not be economically viable unless there is a significant value advantage. In fact, it is also difficult to set up and run a data recording system for small-holders due to size constraints and remote farm units. In this article, they introduce a framework for tracking livestock health status using radiofrequency detection and telemetry. Moreover, the program can be used to gather health status information on a regular basis and to provide veterinary services. The integrated system comprises of a temperature sensor associated with a semi- passive RFID tag attached to the animal ear, in communication by radio frequency with a box that contains an RFID reader and a local computer which treat the received information. This data is subsequently transmitted simultaneously to the server and to a small box that contains an LED circuit as a visual indicator. The central database offers dashboards on animal safety, veterinary follow-up, and emergency response. This system enables their health status to be monitored to avoid loss and contagion.

[9] Many farmers are now being tormented by various animal diseases and the cost of breeding is increasing. Compact wireless devices in the modern era have made monitoring of animals increasingly intelligent. Animal heat detection, however, remains a complicated and inconvenient method. To determine animal health, heat stress and reproduction for artificial insemination during livestock control, a full integrated information and communication system is required. Here, wearable sensor-based device based on collar is placed in the neck of the animal to help farmers monitor the condition of the animal remotely through wireless communication and take timely action in emergency situations. A cloud-based system has been introduced for animal husbandry that would be useful in the healthcare solution for IoT. In this article, we suggested an adaptive livestock management system method for animal husbandry to assess the animal's health status, heat stress and reproduction within animals. The system of animal monitoring is useful for all kinds of commercial farmers who can afford to monitor their cattle using a GSM-based application.

[10] Scientists and engineers are now generating many advanced technological techniques in real-world operations. Farm automation is one of the advancing streams of technical innovation. Human system's everyday needs are met through the use of many farm products. Farm productivity is linked to farm automation and to cattle indirectly. To order to maximize farm productivity, it is essential to take note of the cattle's safety and also to use numerous farm automation operations that are not environmentally harmful. The cattle health surveillance system is the current topic of farm automation research. Some sophisticated technological tools are essential for tracking any system, such as handheld phones or remote sensor networks. The suggested control system requires infrastructure, hardware, technology and clinical resources which are representative. There are many cattle in many dairies. It is therefore too difficult to take care of them and monitor the health of dairy cattle on a routine basis. So, the holder of the dairy and local authorities is very adamantine in this job. The main aspect of the health monitoring system is to continually monitor the health of cattle individuals, as quickly as possible to diagnose and treat sick cattle. We use sensor technology in this system to map the special aspects of animal behaviour such as temperature, heart rate, etc. This data is aggregated and reported to the health center.

[11] In rural areas, agriculture is the main source of income. Animals such as horse, donkey, sheep, goat, and so on play a major role in rural life. We are used as an income source. Animal husbandry is therefore a major concern. Most farmers are now tormented by numerous deaths and higher breeding prices, etc.Therefore, efficient and technical methods for farmers to increase productivity and reduce the husbandry of the animal are essential. We illustrate the farmers technology of the Wireless Sensor Network in this study.We recommend that a wireless sensor network be built on farms for environmental selection, which will then make it easier for farmers not only to track animals from outside the farm via the

internet, but also to better control the environment of farms in remote locations.Changes in the environment (temperature, humidity, and light) affect cow performance through farm stress and disease. It also lowers the productivity of the farm. Animals and environmental monitoring are an essential category of applications for sensor networks. Since end users are ultimately interested in the sensor data, the sensor network structure should provide the user with the actual information.Our proposed system can monitor cow health effectively, monitor the farm's environmental parameters effectively and monitor the farm's environmental parameters.

[12] This research was aimed at examining an institution using an Intelligent System that used Raspberry Pi and Arduino Uno to use an Embedded System and Smart Phone to handle chicken farming and problem solving. A smart machine test and comparative analysis were implemented in this study at a model chicken farm. The findings of this study showed that the device can track the ambient weather conditions including humidity, temperature, environment performance and the control of the filter fan change in the chicken farm. Farmers found the system to be easy to use as they were able to effectively command the farm anywhere at any time, resulting in cost reduction, resource savings, and efficient management in chicken farming. For chicken farming, the embedded system is innovative, transforming a traditional farm into a "smart farm". Furthermore, the system could work on smartphone applications to help farmers control and monitor environmental contexts such as temperature, weather and quality, humidity, light, and filter fan switches in real time.

[13] Automation is the use of computers, control systems and IT to maximize efficiency in material production and service delivery. Automation is the answer to India's quest to be an industrial competitor of the world class. The Indian farms are slowly starting to feel the stimulus for the industry of instrumentation, control and automation. Indian automation is progressing at a rapid pace, yet it is one field that can never be accomplished and admired – something that requires constantcreativity and the recognition of technology trends, as well as the developments that push automation implementation in other countries. India, as one of the fastest growing economies in the world focused on agriculture and manufacturing, has not taken the technology at a rather rapid pace. This project has tried to establish an efficient system for smart farming. Automation has been incorporated into various aspects of the farm. A new animal enclosure layout is being built to improve livestock living conditions and to minimize manual labour.

[14] In the next 15 years, the worldwide demand for meat and animal products is expected to rise by at least 40%. The first question is how to meet this demand by achieving high quality, sustainable and safe meat production. At the same time, there are serious problems with livestock production at the moment. Animal health concerns are growing with regard to food safety and human health. The European Union wants better animal welfare and has made substantial investments in it. At the same time, the livestock sector's environmental impact is a major issue. Finally, it is necessary to ask how the farmer, who is the central figure in this process, will live on more sustainable systems of livestock production. Precision livestock farming (PLF) is one tool that could provide real opportunities. Unlike previous approaches, PLF systems aim to provide a real-time monitoring and management system that focuses on improving animal life by warning when problems arise so that immediate action can be taken by the farmer. Continuous, fully automatic tracking and enhancement of animal health and welfare, consumer yields and impacts on the environment should be possible. The paper provides examples of systems already built to illustrate the potential benefits of this technology. Precision systems for livestock farming tend to be fully automated, continuous systems of management. This means that farmers are provided with knowledge. Clearly, precise livestock farming technology has great potential to create added value for many stakeholders, particularly as a farmer's management tool, enabling improved animal welfare, health, efficiency, and environmental impact. Precision systems for livestock farming tend to be fully automated, continuous systems of management. This means that farmers are provided with knowledge.

[15] This paper discusses the critical issues posed in the management of mobile healthcare and propose a new solution to the problem. This paper addresses self-developed control of BCG, posture correction program, and applications respectively. A 3-loadcell chair-type BCG system is designed and established to enable continuous monitoring of heart condition and adjustment of posture at the workplace and daily life. To provide a wireless monitoring function, the integrated 3-loadcell chair is also fitted with a Bluetooth transceiver. The 3loadcell chair sensed data is transmitted to the mobile. The transmitted data is monitored in real time by a smartphone application. Detected a digitized analog signal using the built-in ADC feature in ATmega8L and sent via Bluetooth transmission to the smartphone. The data on BCG and posture correction are monitored using an Android application developed in-house. For wireless measurement of BCG and posture correction signal, users can sit on the 3-loadcell chair system. The proposed solution is body-free and non-invasive. Therefore, ithas provided a very convenient and easy way to monitor the healthcare approach.

[16] Livestock farming these days could add to the farmers a huge profit. To ensure that the animal is in good condition, the main element must be considered by monitoring the health status. Collections of health data in the field such as core body temperature, heart rate, medicine, ask for a fast and accurate system that requires repetitive time calculation. Using Android Smartphone is one of the popular techniques for measuring the spatial distribution and temporal variation of animal health data content. In this paper we present the Livestock Information System (LIS) development project on Android Smartphone to access animal health data on an ongoing basis. The project uses Android operating system where it is fitted with Bluetooth software where the mobile safety monitors will be interpreted and analysed, and the precise temperature and heart rate of the pet will be shown. To collect statistical data from mobile to PC via web services, this interaction is enabled by Google Cloud Storage. In determining the animal health status, this device is reliable and accurate. The Android-powered device offers some data about the heart rate, livestock temperature, and livestock-taken medicine.

[17] RFID technology recognizes the target automatically and obtains relevant radio frequency signal information. We can collect and exchange information efficiently using RFID technology. This RFID engineering reliability can be used directly in every section of the supply chain for livestock goods. But the use of RFID in the livestock supply chain can be hindered by non-uniform technical standards and high costs, consistent technical standards and increased government funding programs may encourage RFID software implementation and growth. The supply chain for livestock goods, which starts with the procurement of food, veterinary medicine, livestock species and finishes with the customer, comprises of manufacturers of raw materials for livestock husbandry, growers (farmers), livestock slaughtering and processing firms, retailers and customers. RFID is used in the supply chain of livestock goods, data on all supply chain connections can be obtained easily, reliably, in real-time and expediently applied. This ensures the convergence of information and the exchange of decisions in the supply chain.

[18] This paper investigates an application for cattle monitoring adaptation of Wireless Sensor Networks (WSNs). The proposed solution facilitates a desired requirement that the individual animal's condition be continuously evaluated, aggregated and reported to the farm manager. There are several current approaches to animal tracking, from the use of a supermarket to the use of a GSM technique. Such approaches to tracking livestock safety can only provide intermittent data and add significant staff and physical equipment costs. The aim of this thesis is to resolve the above-mentioned pitfalls by using alternate low-cost, low-power consumption sensor nodes that can provide real-time connectivity at acceptable hardware costs. The hardware and software were carefully designed in this paper to provide early indication of potential outbreaks thus following the strict constraints of WSNs. By using low-cost, low-power consumption sensor nodes, this paper provides an alternative approach for animal monitoring system. An Implicit Routing Protocol (IRP) was precisely designed to facilitate real-time reporting when managing instability induced through animal activity.

III. TABLE COMPARISION

Author	Year	Technique	Advantages
Chin-shan chen and Wein-Cheng chen	2019	Automatic Monitoring System	Monitoring and collecting environmental conditions
Khushbu shah, Kinjal shah, Bhabin Thakkar, Mrs. Hetal Amrutia	2019	Internet of Things	Monitor the health of livestock and track the changes in environment of livestock
Faieza Hanum Yahaya, Rubiran liza Ahmad Shauri, Shahriman Abu Bakar	2019	Raspberry Pi Programmed with Python, LAMP to create a web server for storing data	Enhance the weighing process with database
Peerasak Serikul, Nuttapun Nakpong, Nitigan Nakjuatong	2018	Blynk IOT platform	Monitoring the Humidity of Paddy bags tp prevent from paddy rotting
Bhisham Sharma, Deepika Koundal	2018	Wireless sensor Network	Health monitoring System using WSN
Yu Wang, Xi Yong, Zhaofeng Chen, Haiyuan Zheng, Jiayu Zhuang, Jiajia Lin	2018	information technology (IT) and the Internet of Things (IoT), information and intelligent technologies	intelligent management of animal farming, shorten farming cycle, and control farming costs.
Dr. Kirti Wankhede, Sayali Pednekar	2018	IOT and CUJO firewall security	Caring Factor and model for locating animals
H. Bouazza, O. Zerzouri, M.Bouya, A.Charoub, A.Hadjoudja	2017	Inbuilt temperature sensor in RFID tag	Wireless identification,Identification from a distance of the beast by red LED, Dashboard on the livestock health state.
K.Saravanan, S.Saranya	2017	Integrated Information and Communication Technology, IOT, wireless network	Identifies heat stress, Fertility for artificial insemination during monitoring
Sweta Jha, Amrutha Taral, Komal Salgaonkar, Vaishnavi Shinde, Shraddha Salgaonkar	2017	Wearable Sensor Technology, WSNs, IOT, Cloud Computation	To ensure animal well-being in the fast-changing condition of automated farms
S. Jegadeesan, Dr. G.K.D. Prasanna Venkatesan	2016	WSN, Zigbee	Monitor and control the environmental parameters in the farm
Siwakorn Jindarat, Pongpisitt Wuttidittachotti	2015	Raspberry pi, embedded system and Arduino	Smart farm to control and monitor real time environmentalcontexts
Drishti Kanjilal, Divyata Singh, Rakhi Reddy, Prof Jimmy Mathew	2014	Microcontroller 8051, GSM module	Improves the living conditions of livestock such as auto lock and release of doors, smoke detector
D. Berckmans	2014	Image analysis, Sound Analysis	Increase the efficiency and sustainability of farming and production and to improve welfare of animals
Byeong-Ju Kim, Yun-Hong Noh, Do-Un Jeong	2013	Load cell embedded with Bluetooth transceiver	Noextra cable is attachment to user body and is non-invasive and free from body attachment
M. H. Ariff, I. Ismail	2013	Android operating system where equipped with bluetooth technology, Google Cloud Storage	Provides information of the heart rate, temperature, state of health dataand medication taken by the livestock
Guo Aiyun, Du Debin, He Zhongwei	2010	RFID technology	Automatically identifies the target and obtains relevant information by radio frequency signal
Kae Hsiang Kwong, Trung Ta wu, Hock Guan, Goh, Bruce Stephen, Michael Gilroy, Craig Michie, Ivan Andonovic	2009	WSNs, GSM technique	Cattle monitoring by using low cost, low power consumption sensor nodes

IV. CONCLUSION AND FUTURE WORK

This project is to introduce an efficient smart farm system. A new design for animal enclosures is put forward to improve the living conditions of livestock. A typical farm requires a lot of labour. Automation can proficiently moderate the amount of manual labour, make farming easier and faster. Our project also helps in obtaining livestock count by using RFID detector, which is displayed through LCD, if any livestock is missing it is detected and notified to us by a buzzer. This system is designed to increase the security level and detect if any other animal is with the animal flock so the farmer can take suitable action based on the type of the intruder. Saving time of herdsman in counting their herds and predicting the price of cattle based on their age and weight using machine learning are also some of the benefits of using this project. The feed content is sensed by IR sensor and notified through an android app. Primary health status of livestock such as heart rate and body temperature can be detected using sensors. From the above data i hereby conclude that by implementing this project reduces manual labour using automation in farm system. The health status of livestock can be maintained regularly and the amount of feed to be given to the livestock is maintained. In future our project can be enhanced by using robotic arm for primary health monitoring and pi camera can be installed to detect diseases by using image processing.

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