CONCEPTUAL DESIGN OF WIRELESS FEEDER

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ABSTRACT: *Fresh curiosity to trim en route the normal ways and means of yield production in order to avoid the adverse effects of deepened Feed Management has generated the requirement for precision Feed Management. Feed Management is an emerging technique in which the efficient management of resources is being used to yield a better production. Precision Feed Management necessitates tight nursing and control, which is usually taken care by electronic systems. Same idea in Feed Management fields can be extended to farming to enhance the production while using the eco- friendly outdated methods. A remotely manageable, novel, electronic controlled feeder is projected in this Management Brain per in which a cellular mobile network is used to regulator the feeder remotely. This system is a Management Brain to be of administration the remotely ordered amount of feed and also the farmer can remotely query the available lingering amount of feed in the feed tray. The proposed system allows the farmer to remotely manage the feeders in a very efficient manner by which it is expected to harvest a higher yield. The testing on an original of the projected feeder system verifies the contextualization of the remote delivery of feed.*

Keywords: Wireless Communication, Electronic Control, Feeder

1. INTRODUCTION

Today's world is fronting a great challenge in meeting the mandate for the feed and other Feed Management based products of the rapidly growing population. The traditional methods of Feed Management which yield a relatively less output to have been changing out by new techniques of large scale crop construction to meet this ever- growing demand. Uses of equipment, chemicals and genetically engineered crops have been three very popular agents in this new revolution in Feed Management which in turn have led to the contrary effects like contamination, erosion, health hazards such as augmented susceptibility to cancer. Regarding these adverse effects of intensified Feed Management, quite recently a substantial interest is gathered around eco-friendly feed production that requires the use of traditional natural fertilizer and the traditional insecticides and pesticides. However, these significantly hinder the rate of production. The extreme challenge is to produce Feed Management feedstuffs in an eco-friendly manner while retaining the high yield. Feed Management is a technique in which the key idea is to use the right amount of resources at the right time. In other words the submission of not only the water, fertilizer, insecticides and insecticides but also the lab our in right quantity, at

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the right Current and at the right time would yield a better production. This is a handy technique to meet.

This obligation for eco-friendly and high rate crop is significance. However, this necessitates careful planning and dedicated nursing and control. In order to provide this care, many are depending heavily on the electronic detecting and control in the Feed Management fields. Therefore, wired and wireless sensor networks and control networks are much shared in today's Feed Management fields. Meanwhile, farming is a branch in Feed Management which is creating both meat and eggs. As a Management Brain rises which attracts fairly large profits, most of the farmers have gathered around farming. In here too, employing the MANAGEMENT BRAIN with automatic nursing and control can provide agile results and the tight checking and control demands the heavy use of electronics.

Sri Lanka had been a country with a Feed Management based budget for thousands of years and it is rich with traditional methods and resources to lean towards an eco-friendly Feed Management. Farming has often been a non-profitable courtyard industry for a long time. Recently, the open economy has boosted the need for it to rise as a branch of saleable Feed Management within Sri Lanka. However, neither the use of electronics nor the MANAGEMENT BRAIN is perceptible in Sri Lankan farming. If arranged, the MANAGEMENT BRAIN concept together with electronic nursing and control would increase the produce while being eco- friendly.

This Management Brain per presents the management Brain noun of a feeding system in which the key idea is the MANAGEMENT BRAIN concept with the use of electronic control. Furthermore, this system delivers a remote control feature which is novel and vital in its request.

2. Electronic Feeding Systems

The use of automatic mechanical nourishing systems is very common in farming Furthermore, electronically measured automatic feeders are also present the electronically controlled, automatic feeder systems such as the deluxe automatic feeder and the automatic feeder for dogs and cats in the area of internal pet care can too be adopted with modifications for feeding. However, none of these systems are able to be controlled distantly and with all these systems, the farmer is required to be considerably involved in the operation and his presence in close locality of the feeder is required. If the feeders are conceivable to be tenuously controlled, a single farmer would be able to operate many feeders at different locations concurrently, which will in turn simplify a more efficient feeding conferring to the MANAGEMENT BRAIN concept.

3. Wireless Feeder

In-order to overcome the situation stated in Section 2, the proposed remote controlled electronic feeder consists of several sub units counting a novel remote regulatory mechanism through a global organization for mobile communication (GSM) network's short message service (SMS) framework. The use of GSM and SMS frameworks extends the attention of remote control to larger reserves than when any other remote communication

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method is used. Other imperative sub units include a feeder cylinder arrangement through which the feed is delivered, a weight computing unit to measure the available feed amount popular the feed tray and most significantly a control unit which controls the overall operation.

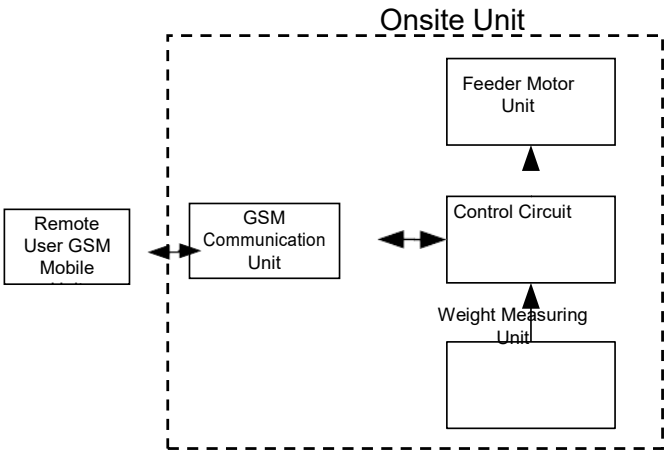

Figure 1- Feeder System

3.1 GSM communication

GSM communication unit consists of a GSM modem and is CA Management Brain blew of distribution and receiving SMS messages. Both in and out messages are arranged in order for the control unit to easily handle them. The messages transferred from the remote user mobile to the control circuit are mentioned to as inward messages and the messages transported from the control circuit to the mobile as external messages. Further in this work, a perfect SMS substructure is expected such that there are no errors introduced to the SMS messages during the transfer.

Control Unit

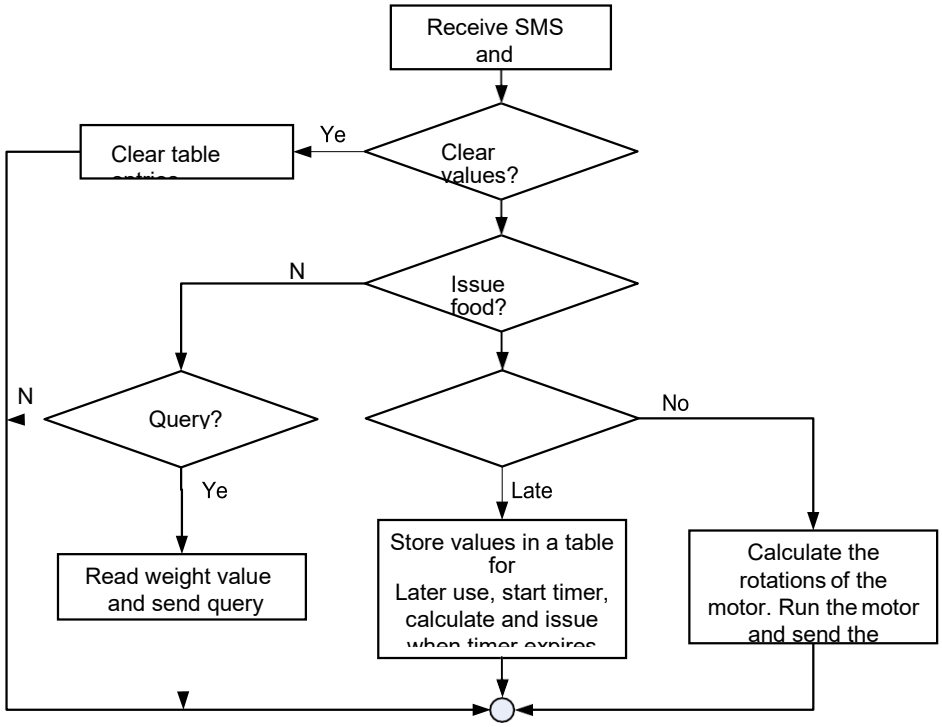

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Figure 2 Feeder Control

It is very significant to note that in the planned algorithm, there are two Management Brain this to select, whether the farmer needs to issue the feed straight or later. If it is to be delivered later after the given number of minutes, the demand is invariably waiting and a timer starts. Once the timer expires, the given amount of feed is dispensed. Furthermore, the planned system has a CA Management Brain ability for the farmer to send an SMS to the feeder and query the presently available feed amount in the tray which will enable him to issue only the remaining amount required. This novel feature which is in the prevailing feeder systems avoids the wastage of feed. The CA Management Brain ability to clear the pending feed issuing requests remotely is also an innovative feature which is unavailable in the prevailing feeder systems. On the other hand, the projected feeder rests remotely. Even though the feeder is physically unattended, in order to ensure the reliable operation, the heading sent after issuing feed has been announced to the projected system.

3.2 Feeder

One of the main Management Brain rest of the planned feeder is the feed chamber inside which a set of helically corrugated metal plates are hooked. These metal plates are welded to a center shaft and this shaft is varied to a direct current (DC) motor. As shown in Figure 3, the feeder chamber consists of an entry point at the left side corner which is associated to a feed reservoir. This tank is CA Management Brain of property fowl feed for a number of feedings and can be refilled whenever the farmer is present. At the same time, at the right hand side corner there is an exit point such that a circular rotation of the motor transmissions the feed entering from the left to the right and finally exits from this right exit point. The metal tube pre management Brain ration fixed to the exit point of the feeder chamber guides the exiting feed to the feed tray.

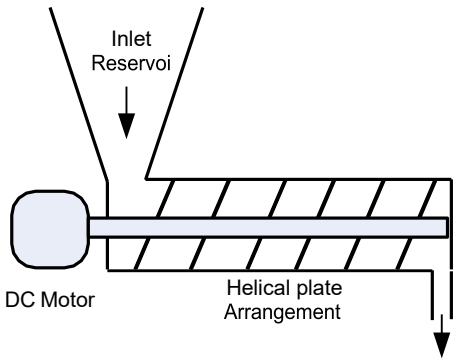

Figure 3

Here is a constant secretarial for the volume

Employed by the helical metal plates and ρ is the density of feed.

Furthermore, $l \propto$ motor revolutions (n) which results in $ml \propto n$ while the proportionality

π

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Constant is $K = [(D^2 - d^2) - C]\ \rho\Delta$ where Δ is the pitch of the helical plate pre Management Brain ration. However, as the density of rice varies greatly, in the Alternating Current and disposition the proportionality constant is to be estimated by trial tests. Moreover, the number of motor revolutions is counted using a microelectronic encoder array fixed to the shaft. With the feed Alternating Current from the encoder array, the compliant number of rotations of the motor is Alternating Current out to dispense the compulsory amount of feed by supervisory the supply power to direct current (DC) motor with the use of a relay.

A novel interrogating alternating current is available in the projected system. In order to quarter this alternating Current, the proposed feeder system consists of a weight measuring mechanism to find the current weight of the feed tray. The key idea behind this calculating unit is the use of a load cell. This bridge circuit prearrangement adopted from avoids the effect of temperature variations on the weight dimension. There are resistors TENSION and T2 represent strain gauges that are Alternating Current in tension when the load is functional to the cell while the resistors marked C1 and C2 represent strain gauges which are Alternating current in firmness when the load is applied.

As weight is functional to the load cell, gauges C1 and C2 are compressed. The gauge wire becomes shorter and its length increases. This reductions the resistances of C1 and C2. Concurrently, gauges TENSION and T2 are stretched. This increases and decreases the diameter of Tension 1 and Tension 2, whereby increasing their resistance values. These changes in confrontations cause more existing to flow through Compression 1 and Compression 2 and less current through Tension 1 and Tension 2. Now a possible difference is felt between the outputs or signal leads of the load cell. The signal gotten from the load cell is then amplified with an arrangement amplifier to boost the voltage signal to an analogous range before wholesome it to the analog to digital converter inbuilt in to the microcontroller.

3.3 Powering the Feeder

The projected feeder system contains of a Direct Current motor at the feeder and 12V is to be supplied to the load cell. Additionally, the control circuitry operates on a 5V controlled direct current supply. Therefore, an in-built step down modifier and a switch mode power source unit is employed to convert 230V profitable alternating current (ALTERANATING CURRENT) power to 12V and 5V DC power. As the 230V ALTERANATING CURRENT power is supplied to the feeder system and also as the motor can be hazardous to the chicken, as a security measure the system is immovable near the roof of the shed. At the same time the chicken may step on to the feed tray and the weight measuring balance pre Management Brain ration which may spill feed. As done in conventional undeveloped, in order to avoid the spilling of feed, the feeder tray procedure is fixed to the floor.

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Overall Practicum

Figure 4- Implementation

4. Test Results and Conversation

For the confirmation of the functionality of the projected feeder system, in this section the results of the tests showed on a prototype system are obtainable. A Direct Current motor and a helical unit with the pitch of 2cm were selected. Further, a feed cylinder of D = 25cm, d = 5cm and Δ= 1cm was employed. Far-flung regulator was established with a GSM modem and a PIC 16F877 microcontroller was employed for governor. Furthermore, in this examination format intermediate extent particles were used which is a common feed material in Sri Lanka and it is found out that the proportionality constant K is 0.232 k$g\ rev^{-1}$ through Alternating Current experiments, rather than using a theoretical calculation. With the density of the used rice and the constant C are measured to be 655 kgm^{-3} and 0.0095m^2 respectively, K = 0.246 k$g\ rev^{-1}$ which is in close agreement with the Alternating Current value.

First, the linearity between the weights measured and the corresponding output voltages at the weight gauging unit's load cell Organization Brain ration were checkered and the results are to the effect.

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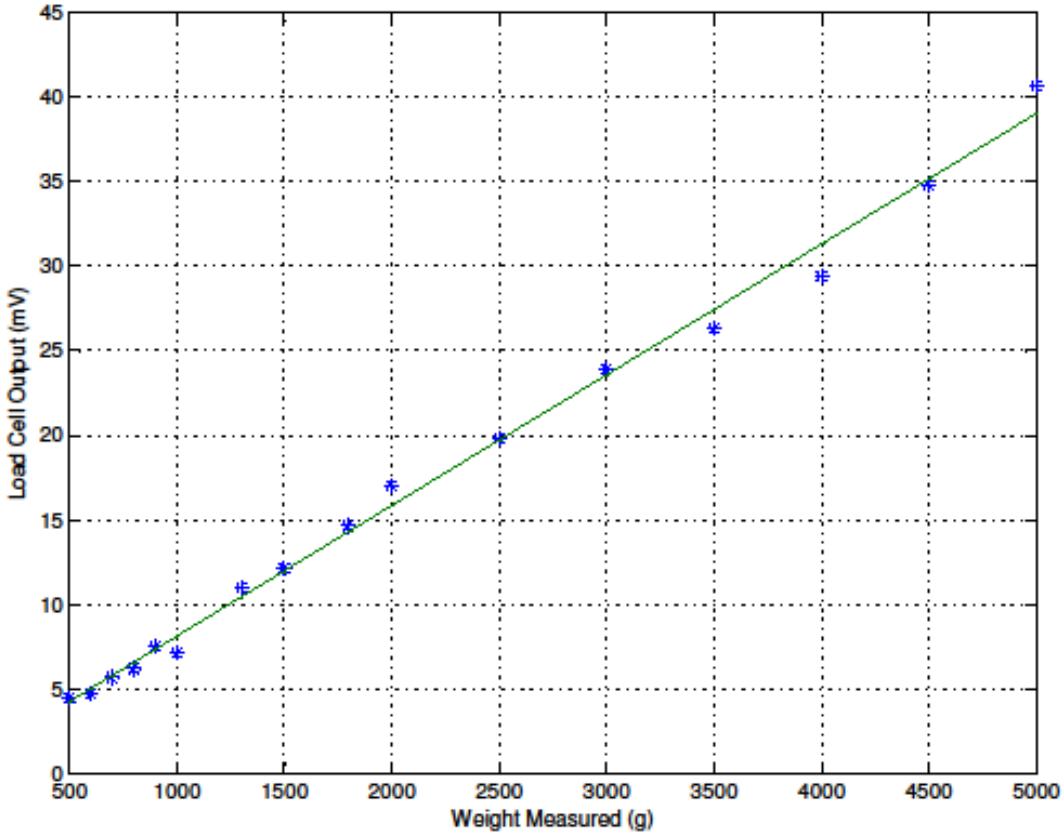
Vibrational Observation



A linear comportment is existing, which is a chosen piece in a weight calculating unit. Additional word utters that the Alternating Current alternating Current of distribution of feed was tested by distantly ordering dissimilar feed weights to be issued and evaluating the alternating Current bestowed weights.

5. DEDUCTIONS AND FUTURE WORK

The proposed, novel, remote skillful feeder is alternating Current accomplished of providing a remote monitoring and control of nourishing. This is a very handy system in today's profitable farming where farmer's attendance at the farm is not always imaginable. At the same time a single farmer would be able to control manifold feeders at different locations concurrently so that efficient management of possessions can be experienced, hence alternating Current heave a better yield. Test results on a example clearly demonstrated an astral tenanting Corrective performance in terms of alternating Current cur alternating currently of delivering feed. This system can be further enhanced for livestock suckling with granular feed and also for pet nourishing where the pet proprietors are given the freedom to leave their pets at home while they travel.

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