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Agro-Amigo

Agro Based Web Marketing and Automated Irrigation

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Abstract: Agriculture is the backbone of our country. One of the biggest problems faced by a farmer is marketing the products and irrigation facility. The farmers are unaware of recent trends emerging in agricultural field. This paper tells about a system which consists of a website in which agricultural marketing can be done without the interference of mediator, so that profit can be directly gained by a producer. It also gives information about all the current trends in agricultural field. It allows renting agricultural tools.Irrigation by help of freshwater resources in agricultural areas has a crucial importance. Because of highly increasing demand for freshwater, optimal usage of water resources has been provided with greater extent by automation technology.This paper also describes about automated irrigation using soil moisture sensors which not only prevents the moisture stress of trees and salification, but also provides an efficient use of fresh water resource. In addition, the developed irrigation method removes the need for workmanship for irrigation.

Keywords: Marketing; Irrigation; Soil Moisture Sensor; Rating; Database;

I. INTRODUCTION

Agricultural irrigation is highly important in crop production everywhere in the world. Therefore, efficient water management plays an important role in the irrigated agricultural cropping systems. A site-specific sensor-based irrigation control system is a potential solution to optimize yields and maximize water use efficiency for fields with variation in water availability due to different soil characteristics or crop water needs. Secondly, the marketing is inferred to cover the services involved in moving an agricultural product from the farmer to the consumer. Effectively, the term encompasses the entire range of supply chain operations. However, its key function is to help direct the services, by providing competent and able market information, thereby linking the other operations into an integrated service with targeted outcomes.

In this paper, the development of an automated irrigation system based on microcontrollers and wireless communication at experimental scale within rural areas is presented. In addition, the agricultural marketing that helps avoiding isolation of small-scale farmers from the benefits of agricultural produce they need to be integrated and informed with the market knowledge like fluctuations, demand and supply concepts which are the core of economy. The aim of the implementation was to demonstrate that the automatic irrigation can be used to reduce water use and marketing helps the farmers to reach their customers within very short lead time.

II. RELATED WORKS

Ms. K Kiruthiga [1] proposed the concepts related with the marketing of agricultural produce. It covers the function performed in the marketing process of agro produce, the functionaries involved, problems in agricultural marketing in developing countries when compared to the developed countries and the reforms required to rectify the problems.But it had the disadvantages like Lack of Transportation Facility, current market information and the quality of the product was not assured.

RanjithRaja.R[2] introduces the idea in the agriculture field about proper method of irrigation which is important and it is well known that irrigation by drip method is very economical and efficient. In the conventional drip irrigation system, the farmer has to keep watch on irrigation, which is different for different crops. The purpose of this paper is to provide more facility in agriculture field by using Zigbee The project describes an application of wireless sensor network controlled irrigation. Here there are two Microcontroller units, one unit is placed in agricultural field and the other unit is placed in main control unit which is interfaced with motor unit. The field unit will be monitoring the humidity of air and moisture level of the water. It will transmit the information periodically to the main unit. If sensor data is not up to the threshold level, the main unit will turn on the motor. The motor will be turned automatically if threshold level is met.But the main disadvantage in this system is

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low complexity and short range.Since two microcontrollers are used operating also would be high.

Proposed system provides a web page which contains the details of current market trends which would be helpful for the producer to select a proper crop and carryout his agricultural activity.It also includes direct marketing of agricultural products,borrow/lending of agricultural tools.Additional feature is provided by this system that is Automated Irrigation using moisture sensor which does not include the human intervention. The pump status can be viewed by the producer along with current temperature details.These information will help the producer to carry out his daily activities of his field.

III. REQUIREMENTS

A. Hardware Requirements

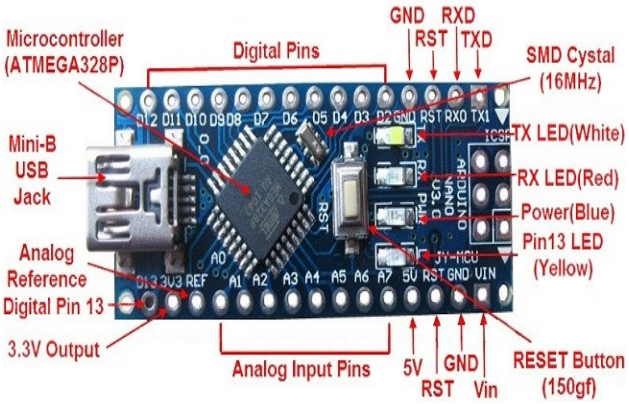

Fig 1. Pin diagram of Arduino Nano

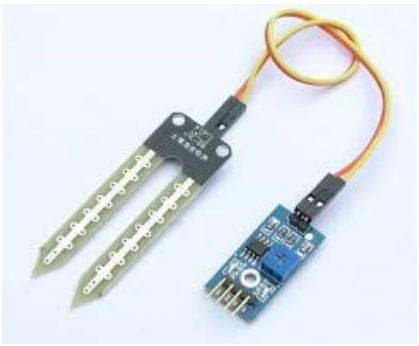

Fig 2. Soil MoistureSensor

a) Arduino Nano V3.0

The Arduino Nano is a small, complete, and breadboard-friendly board based on the ATmega328 as shown in Fig1.It lacks only a DC power jack, and works with a Mini-B USB cable instead of a standard one.The Arduino Nano can be powered via the Mini-B USB connection, 6-20V unregulated external power supply (pin 30), or 5V regulated external power supply (pin 27). The power source is automatically selected to the highest voltage source.

b) Soil Moisture Sensor

Soil moisture sensors measure the volumetric water content in soil. Since the direct gravimetric measurement of free soil moisture requires removing, drying, and weighting of a sample, soil moisture sensors measure the volumetric water content indirectly by using some other property of the soil, such as electrical resistance, dielectric constant, or interaction with neutrons, as a proxy for the moisture content. The relation between the measured property and soil moisture must be calibrated and may vary depending on environmental factors such as soil type, temperature, or electric conductivity. Reflected microwave radiation is affected by the soil moisture and is used for remote sensing in hydrology and agriculture. Portable probe instruments can be used by farmers or gardeners.

B. Software Requirements

- Windows operating system
- Visual Studio 2010
- SQL Server
- ASP .net

IV. PROPOSED SYSTEM

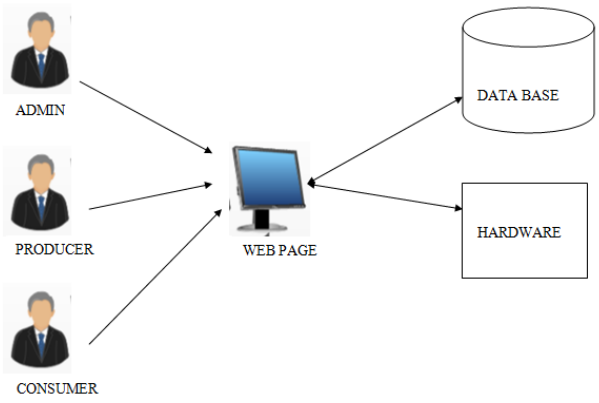

Fig 3. Overall system architecture

It consists of following modules:

(i)Admin

(ii)Producer

(iii)Consumer

A. Admin Module

Login: Admin will login to the website through his user-id and password as shown in fig 5.

View details: Admin can view the details of producer, consumer, product and tools. If details are found invalid, the admin can remove it as shown in fig 6.

Add information: Admin can upload information related to technology, subsidy and fertilizers. He can remove the details if the information is out-dated.

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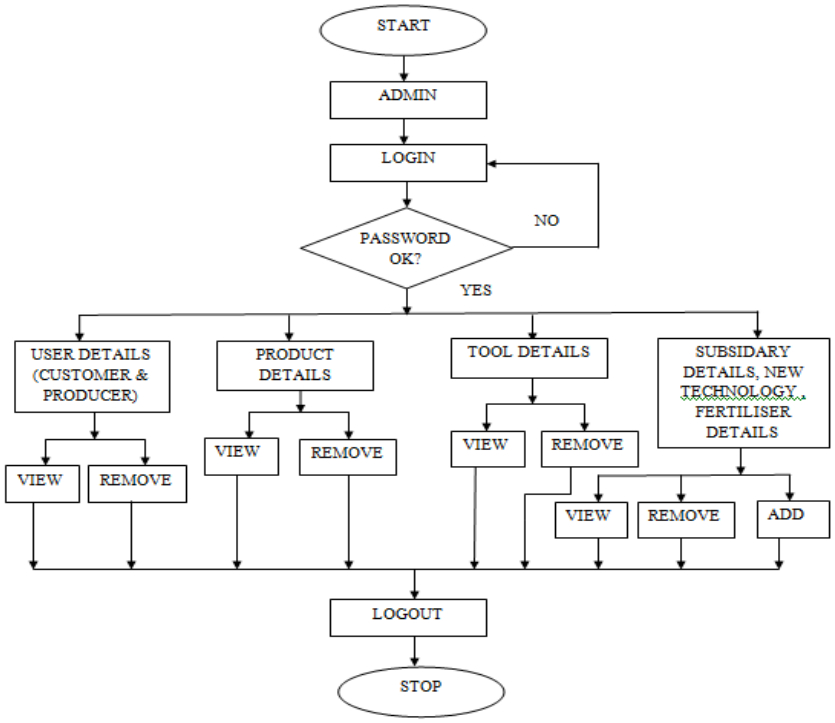

Fig 4. Flow Diagram for Admin Module

Fig 5. Login Page

Fig 6. Admin Page

B. Producer Module

Registration: Producer who wants to advertise their products should register in the website as shown in Fig8.

Login: Producer should login with appropriate credentials as Fig 5.

Add products and tools: producer should add the details of their product and tools with appropriate prices as in Fig 9.

View details: producer can view the information added by the admin as in Fig 8.

Irrigation details: Producer can also view the moisture content of his land and the current status of the water supply as in Fig 9.

C. Automated Irrigation System Design

External connection shown in Fig 11 is established through micro-USB to regulated power supply board which provides constant 5V DC. Moisture sensors are connected to Arduinonano (ATmega328 microcontroller) via voltage comparator circuit namely, LM393.processed information from arduinonano is fed into the relay driver which indicate on/off of the bulb and then to relay which will be interfaced with the pump.

D. Consumer Module

Registration: Consumer who wants to advertise their products should register in the website as in fig 7.

Login: Consumer should login with appropriate credentials as in fig 5.

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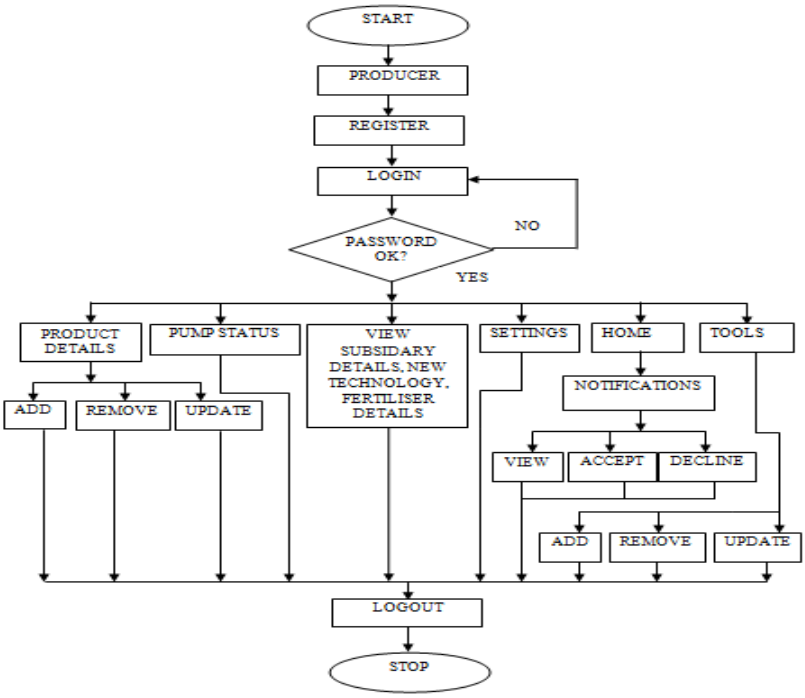

Fig 7. Flow Diagram for Producer Module

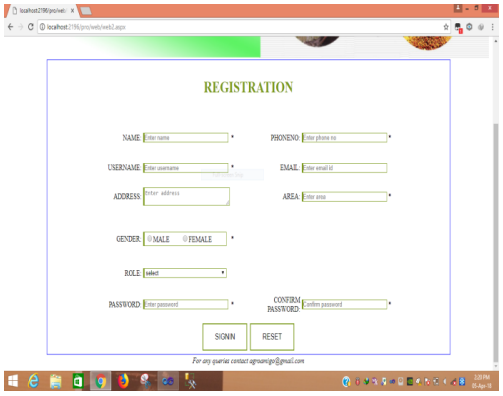

Fig 8. Registration page

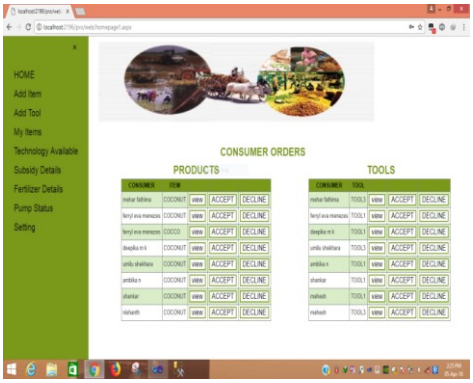

Fig 9. Producer Home Page

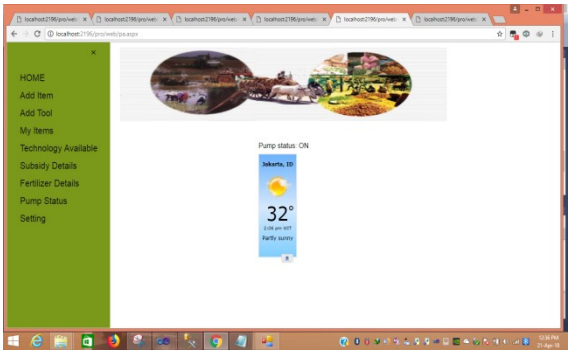

Fig 10. Pump Status

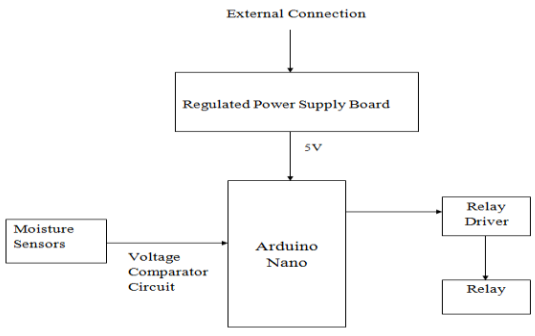

Fig 11. Block diagram

Product and tool search: Consumer can search for the products and tools and can order if interested as in Fig 13. Consumer can also rate interested items and tools

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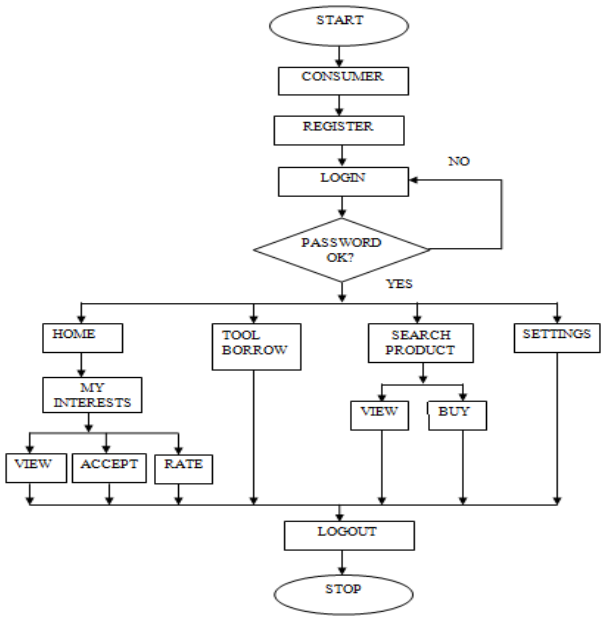

Fig 12. Flow Diagram for Consumer Module

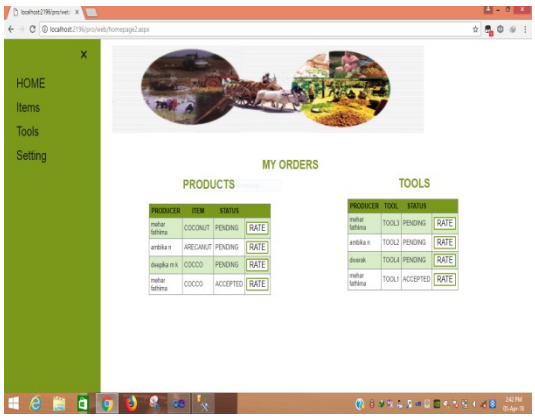

Fig 13. Consumer homepage

V. CONCLUSION

This paper provides an efficient way in marketing of agricultural products. Producersget the profit directly without the interference of mediator. As per the requirement of the producer, agricultural tools are available for rent. Additional feature that is provided for producer is the Automated Irrigation.This will save water since Motor ON / OFF status is based on sensed moisture. This application provides most of the agricultural services required by farmers.

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