



# ADVANCED PAYROLL MANAGEMENT SYSTEM IN TEA PLANTATIONS USING EMBEDDED TECHNOLOGY

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## ABSTRACT:

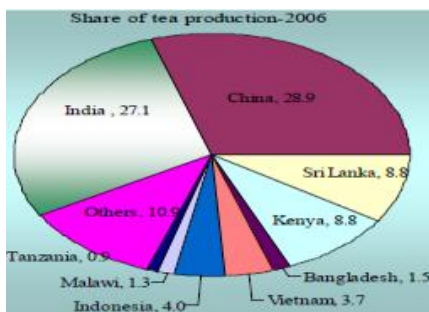
This paper deals with automatically calculating the payroll of each employee in tea plantations using embedded system. Tea industry plays an important role in the Indian economy and involves large number of employees. Therefore an embedded system is needed to maintain their records and monitor them. In current scenario, updating information about an employee and calculating payroll manually is time consuming and tedious process. There is also a problem of inaccuracy since humans make errors. In the proposed system payroll of each employee is calculated automatically according to the work done by them in a particular day. Employees will be recognized by using the biometric system and their details will be displayed on the LCD screen. All their work details are sent to the central office using the GSM module. Their payroll will be calculated using company database server and updated to the manager. The input and output process will be controlled by the

microcontroller. The advantages of proposed method are more accuracy and data security.

**Keywords---** Payroll, Biometric input, GSM Module, Database server, Employee, Updating, Information.

## I. INTRODUCTION

India comes in second in the world tea production. The industry in India includes small and big growers and government plantations. Though the major portion of tea production in India is highly concentrated in some specific regions, it is scattered in different states. India holds around 19 per cent (521403 ha.) of the total area of tea cultivation in the world (2774797 ha). The total production of tea in India shows an increasing trend from 1999; and though the trend fluctuates from year to year, the production has moved positively upward.



**Fig1. Tea Production in India**

Tea industry is one of the largest industries in India. It involves large number of employees. Maintaining the records and calculating payroll of large number of employees is a tedious and time consuming process. It requires human effort and there is also a probability of inaccuracy since human makes errors. Therefore an embedded system can be used in place of humans thus minimizing errors and providing accuracy.

This paper aims to design such an embedded system to help the employers of tea plantations to maintain the record and calculate the payroll of the employees. An embedded system is nothing but a computer with a dedicated function within a larger mechanical or electrical system, often with real-time computing constraints. It is embedded as a part of a complete device often including hardware and mechanical parts.

## II. LITERATURE SURVEY

India is the second largest producer of tea in the world, and produces around 955.9 million kilograms of tea, accounting for 27.1 percent of tea produced worldwide. The industry accounts for the employment of more than 2 million people. It

occupies an important role in the Indian economy not only due to its capacity to earn foreign exchange, but also because it impacts the livelihoods of scores of people employed directly and indirectly by the industry. North India accounted for 76.3 percent with 729.6 million kilograms, while south India had a share of 23.7 percent with 226.3 million kilograms. Indian tea makes both in national and international markets. India holds fourth position in the world tea market and accounts for 12.9 percent share. From being a predominant consumer of loose tea, the Indian tea market has slowly transformed into a brand-dominated packet tea market. Christo Ananth et al. [4] discussed about a system, GSM based AMR has low infrastructure cost and it reduces man power. The system is fully automatic, hence the probability of error is reduced. The data is highly secured and it not only solve the problem of traditional meter reading system but also provides additional features such as power disconnection, reconnection and the concept of power management. The database stores the current month and also all the previous month data for the future use. Hence the system saves a lot amount of time and energy. Due to the power fluctuations, there might be a damage in the home appliances. Hence to avoid such damages and to protect the appliances, the voltage controlling method can be implemented.

The process of tea production has a series of procedures and processes. The process starts with the plucking of tea leaves in the tea estates by women employees carrying a basket over the head and ends with the



production of ultimate tea. After the plucking of tea leaves there are different steps to be followed and they are explained process. This process requires large number of human labours.

There are various process involved in tea manufacturing. The first process followed by plucking is withering. Withering is the process of removing moisture from the green leaf. The next process is rolling. The primary objective of rolling is to crush the leaf into small size. Chemical spraying is also one of the processes involved in the manufacturing. All these processes involve human labour for the manufacture of good quality tea. Therefore, a unique record of each employee has to be maintained to know about their details and to mark their attendance for a particular day for a particular work and calculate payroll.

**www.forests.tn.nic.in** - With a socio-economic objective to rehabilitate the repatriates from Sri Lanka to India under the shastri-srimavo pact, the Government of Tamil Nadu introduced the Government Tea project in 1968 and implemented it through the forest department. Later, the project was registered as a government undertaking under the companies act, 1956 called "Tamil Nadu Tea Plantation Corporation Limited" which is now popularly known as TANTEA. The authorized share capital of this corporation is RS.15.00 crores and the paid-up share capital is Rs.9.96crores. The Government of Tamil Nadu holds the entire share capital of the Corporation. The corporation is maintaining tea plantations over an area of 4311.04

hectares and provides employment to about 6250 permanent workers and about 3000 casual works.

**en.wikipedia.org**- Commercial production of tea in India began after the conquest of large areas by the British East India Company, at which point large tracts of land were converted for mass tea production. The widespread popularity of tea as a recreational drink began in earnest in the 1920s, after a successful advertising campaign by the Tea Board and several mass promotion drives by government, using railway stations as a base.

Today, India is one of the largest tea producers in the world, although over 70 percent of its tea is consumed within India itself. In this, India is also among the top 5 per-capita tea consumers. A number of renowned teas such as Assam and Darjeeling also grow exclusively in India. The Indian tea industry has grown to own many global tea brands and has evolved intone of the most technologically equipped tea industries in the world. Tea production, certification, exportation, and all other facets of the tea trade in India is controlled by the Tea board of India. The Indian tea industry as the second largest employer in the country has enjoyed the attention of Indian government. The government has been sympathetic to the demand of the industry.

### III. PROPOSED SYSTEM

In the existing method, payroll of each employee is calculated manually. When tea leaves plucked by each employee are weighed in the weighing scale it requires manual effort





to note down the weight of leaves and update it to the account of a particular employee. Similarly, other works assigned to employees such as withering, rolling, chemical spraying also requires human intervention for updating.

The manager in central office visits the plantations everyday to know about the happenings taking place in tea estates and get updated about the performance of employees. If there are number of tea estates under the control of single manager he visits each estate directly to get clear picture of activities in a particular estate. The limitation of existing system is that it is time consuming. Since it involves large number of employees updating must be done quickly. Also, there is a problem of inaccuracy. For example, if the weight of the leaves is in grams then there may be possibility of little deviation in original weight and updated weight. Moreover, calculating payroll for large number of employees manually is more complex and difficult task.

In the proposed system, payroll of employees is calculated automatically corresponding to the work done by them in a particular day. An employee may be allotted works such as plucking, withering, drying, rolling, chemical spraying. Depending on the nature of work, payroll will differ. For example, if an employee is allotted two or more different works then equivalent payroll for each work is calculated and added up which in turn updated to the database. Also, information about each employee such as their attendance, work done by them in particular day etc. and calculated

payroll is made available for manager to view so that he need not visit plantations directly.

In the transmitter side (tea estate) each employee is identified by using biometric systems since all the information are already stored in the memory. Once the employee is identified all the related information such as employee id, name of a particular employee will be displayed on LCD screen. Then, the leaves are loaded on to the weighing scale. Load cell inside weighing scale will create a digital signal directly proportional to the force being measured. Similarly, after weighing tea leaves information such as humidity content, estate code, supervisor code, and number of wayment are displayed on the LCD screen. An employee can have any number of wayment in a particular day. This digital value is stored in a database and is sent to the receiver side by means of GSM module. All the inputs will be entered through keypad interface where an employee will have options such as nature of work allotted, break time, check in and checkout time. All the input and output processes are controlled by microcontroller and therefore it plays an important role.

In the receiver side (central office) the transmitted digital value is received and is placed in a particular host address by the controller. In the company database server payroll will be calculated for employees using databases such as SQL, .net etc. Then it is presented to the manager in the central office thus making his work simple and easy.

#### IV. IMPLEMENTATION

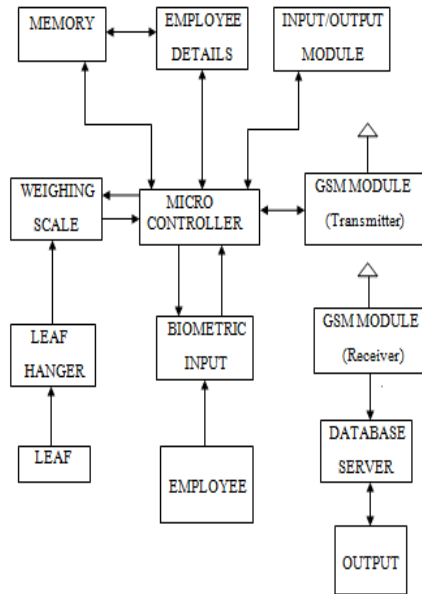


Fig2. Block diagram

##### a) Microcontroller

The Intel MCS-51 (commonly termed 8051) is Harvard architecture, CISC instruction set, and single chip microcontroller series developed by Intel in 1980 for use in embedded systems. Intel's original versions were popular in the 1980s and early 1990s and enhanced binary compatible derivatives remain popular today. The original 8051 core ran at 12 clock cycles per machine cycle, with most instructions executing in one or two machine cycles. With a 12 MHz clock frequency, the 8051 could thus execute 1 million one-cycle instructions per second or 500,000 two-cycle instructions per second. 8051 variants may include built-in reset timers with brown-out detection, on-chip oscillators, self-programmable Flash

ROM program memory, built-in external RAM, extra internal program storage, boot loader code in ROM, EEPROM non-volatile data storage, PWM generators, analog comparators, A/D and D/A converters, extra counters and timers, in-circuit debugging facilities, more interrupt sources, extra power saving modes etc.

Enhanced 8051 cores are now commonly used which run at six, four, two, or even one clock per machine cycle, and have clock frequencies of up to 100 MHz, and are thus capable of even greater number of instructions per second. All silicon Labs, some Dallas and few Atmel devices has single cycle cores.

##### b) Biometric System

Biometrics refers to metrics related to human characteristics. Biometrics authentication is used in computer science as a form of identification and access control. It is also used to identify individuals in groups that are under surveillance. Biometric identifiers are the distinctive, measurable characteristics used to label and describe individuals. Biometric identifiers are often categorized as physiological versus behavioral characteristics.

Physiological characteristics are related to the shape of the body. Examples include, but are not limited to fingerprint, palm veins, face recognition, DNA, palm print, hand geometry, iris recognition, retina and odour/scent. Behavioral characteristics are related to the pattern of behavior of a person, including but not limited to typing rhythm, gait, and voice. More



traditional means of access control include token-based identification system, such as a driver's license or passport and knowledge based identification systems such as password or personal identification number.

### c) GSM Module

GSM is a mobile communication modem. It stands for global system for mobile communication. The idea of GSM was developed at Bell Laboratories in 1970. GSM is an open and digital cellular technology used for transmitting mobile voice and services operates at the 850 MHz, 900 MHz and 1900 MHz frequency bands. A GSM digitizes and reduces the data, then sends it down through a channel with two different streams of client data, each in its own particular time slot. The digital system has an ability to carry 64 kbps to Mbps of data rates.

## V. CONCLUSION

Thus this paper illustrates an embedded system which automatically calculating payroll of employees working in tea plantation. Using GSM module the collected data is transmitted and payroll is calculated by Database Server. It provides high accuracy and data security in calculating payroll without any deviation and modification. It makes sure that employees earn for the work done by them in a day. It saves considerable time by updating information quickly as much as possible since the tea

plantation involves large number of employees. It is also a cost effective system because once it is installed it will serve for years. Also, microcontroller plays an important role since all input and output operations depend on it. Therefore from the above discussions it is evident that the proposed model is more advantageous and effective than the existing system.

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