IoT based Automation of Power Loom in Textile Industries

Shraddha Uday Ingavale, Vishwajeet Khandoji Gujale, Vivek Rajendra Karande, Aishwarya Sanjay Katkar,

Dr. Manoj Dhondiram Patil

Department of Electrical Engineering, Annasaheb Dange College of Engineering and Technology,

Ashta, Sangli, India.

ABSTRACT: Automation is the process to reduce the man power and the idea of automation is to provide a test run in an Atmega328p microcontroller-based system to monitor and control the production operation. The main objective of this project is to control the electric power wastage and take data logs from a motor and also to check the performance of an employee in industries. This system works on Atmega328p microcontroller so it requires low cost and gives efficient performance in unnecessary electric power wastage in power loom motors. In past few years automation has reached to new revolution. Designing a system which easy owner of industry by sitting in front of a single monitor and monitor its whole system is very profitable and time saving. The title of project is "IoT based Automation of Power Loom in Textile Industries". This system will count the work done by worker on the machine and also details of worker who is operation it. All the system is designed on basis of Atmega328p microcontroller, proximity sensor and RFID. The system includes IoT design to observe worker performance online from anywhere in the world.

KEYWORDS: Loom, Atmega328p microcontroller, DC Motor, RFID, and Relay.

I. INTRODUCTION

Power loom is one of the machines used for textile production in most small-scale industries. Industry has become the second largest employment generating sector in the world. Data interpretation system is an Automated Information System which gives better control over production monitoring and takes corrective steps immediately. It provides better control over quality and production. It calculates how much work done by worker on that machine and store the Continuous performance of every single worker in a mill gives a high productivity. With its increasing growth and demand, textile industry faces many problems is the use of automation in textile industries. Automation can be defined as the process of reducing human assistance in the process performed. In most sectors of textile manufacturing, automation is one of the major keys to quality improvement and cost competitiveness. Processes that have been automated require less human intervention and less human tier to develop. A process control or automation system is used to automatically control industry. The process automation system uses a network to interconnect sensors, controllers, operator terminal and actuators.

The textile industry mainly deals with the design and production of yarn, cloth and their distributions. Power loom is one of the machines used for textile production in most small-scale industries. Power loom is motorized loom powered by a line shaft. In most sectors of textile manufacturing, automation is one of the major keys to quality improvement and cost competitiveness. Processes that have been automated require less human intervention and less human tier to develop. A process control or automation system is used to automatically control industry. The textile industry mainly deals with the design and production of yarn, cloth, and their distributions. Power loom is one of the machines used for textile production in most small-scale industry. Industry has become the second largest employment generating sector in the world. Data interpretation system is an Automated Information System which gives better control over production monitoring and takes corrective steps immediately. It provides better control over working process of employee.

II. METHODOLOGY

The name of our project is "IoT based Automation of Power Loom in Textile Industries". The working of this project contains element like RFID tag, RFID reader, proximity sensor, relay, dc motor, GSM, PIC microcontroller. Proximity sensor and RFID card is prior thing in this system. The first element of this is RFID tag, and RFID tag contains data of

a particular worker to which is authorized. RFID card when hold by an employee in front of RFID reader. RFID reader will detect the data that which worker is operating on that particular machine. RFID reader contains the program to read the tag information. Second element of a system is proximity sensor which is calculating length of cloth. This calculating cloth length in meter and this data is added to the authorized employee account which is sent to website using IoT. At the time of salary this information is send through text SMS to worksmobile number.
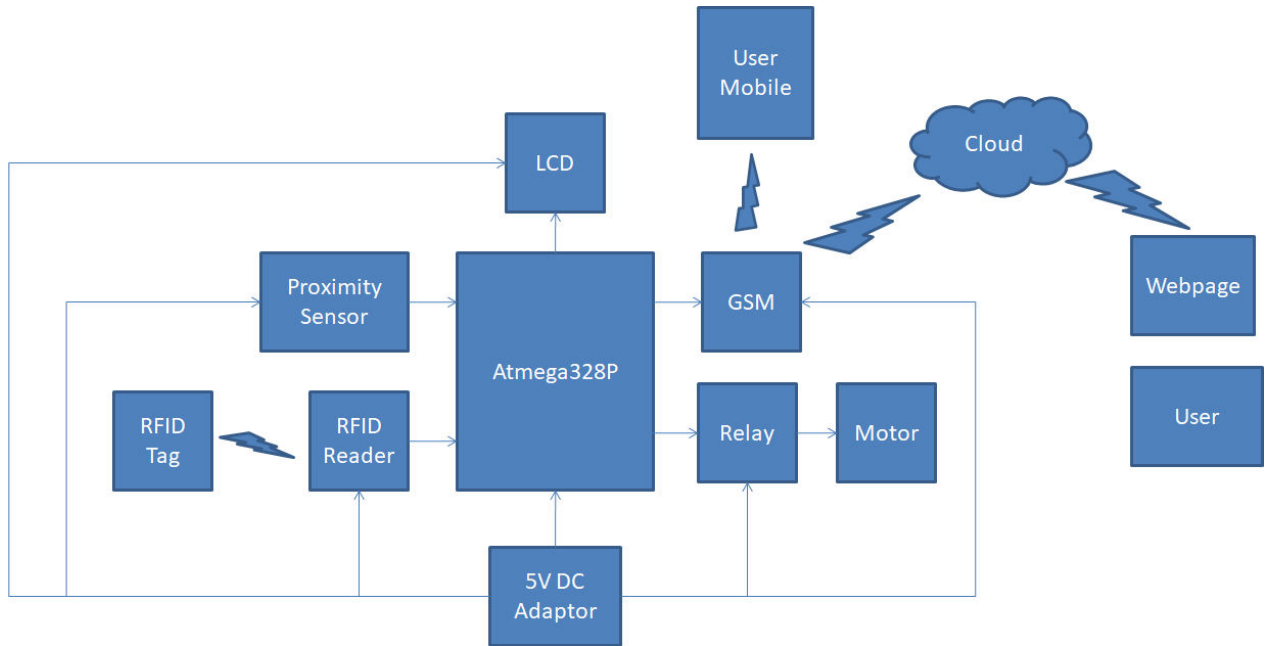
III. FLOW CHART

In that first worker scan the RFID card then reader read the card and verifying the ID of that worker if the information is correct the loom is start. Then using proximity sensor, the length of cloth produced by the weaving loom is measured. Thenthe measured length meter is added on that particular worker ID.
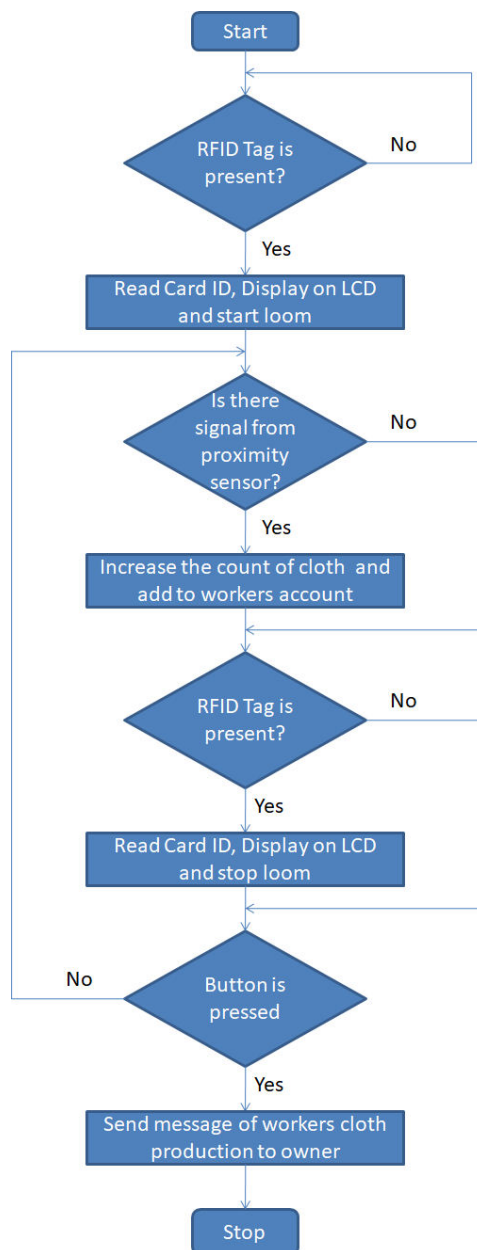
Block diagram:

The system comprises Atmega328p microcontroller, inductive proximity sensor, RFID reader, relay, GSM module and LCD display. The wheel mechanism is used to measure the length of cloth produced by the weaving loom. It is placed on a roll on which the produced cloth is wound. As the cloth produces, it wound on a roll and it rotates the wheel placed on it. The inductive proximity sensor is used to measure the rotation of wheel. Its output is given to Atmega328P microcontroller. Atmega328P microcontroller calculates the length of cloth from the rotation of wheel. The measured cloth length is displayed on LCD. RFID reader is used to identify the worker. The RFID card is given to each worker. Worker shows the card to RFID. So, the system identifies the worker and produced cloth is added to that particular worker account. It will help to calculate the cloth produced by each worker and give the salary according to that. Relay is used to turn ON and OFF the loom. It is connected to loom motor. Whenever the worker shows his card then and then only the loom is started. In the last when we press the switch then the text SMS will send to the worker mobile number through GSM.

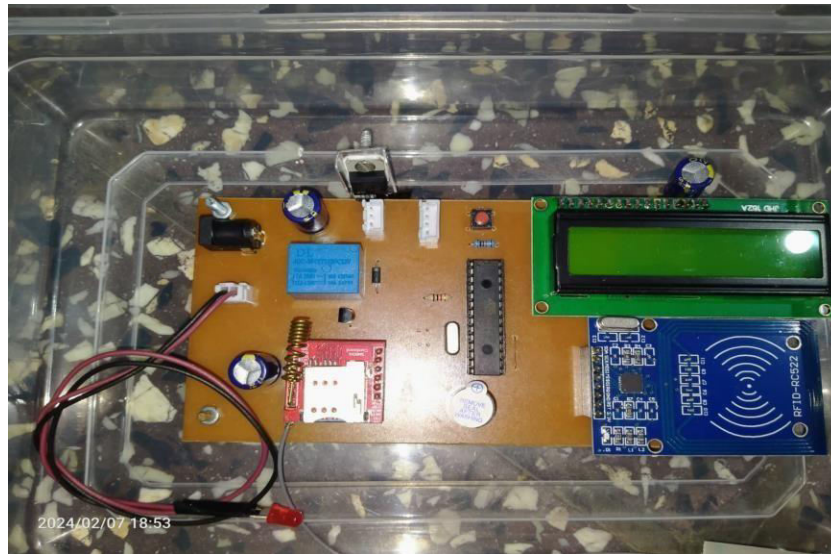

Figure 1: Actual working model.

Figure 2: Actual working model.

IV. RESULTS AND DISCUSSION

The system is always legal. It can be used in all sectors such as the textile industry and energy. This method will ultimately yield results. It is used to control the operation of the generator by using the Raspberry Pi as a controller, and when the thread is cut, it automatically shuts down the system during operation and allows errors to be corrected by notifying the manager or operator of the operation. In addition, in the future, the data scanned by the machine will be displayed to the user on the LCD monitor and web servers, and the data can be retrieved from anywhere. Measure the fineness of the product. The whole system is easy to use. The program has been developed and will be allowed to run onPRFOTEUS7 Professional. The output is achieved when the red light is on when the engine is stopped, the yellow light is on when the engine is stopped, and the green light is on when the engine is running. If the engine only wants to rotate once a key will be given in that direction.

V. CONCLUSION

We have the opportunity to examine various technologies used for loom automation and weft cutting detection. Based on the analysis of the data, we decided that it is necessary to develop a microcontroller-based technology that can detect thread breakage, thus helping to improve the performance of the system, and the Machine learning bench can be used for IoT development. The project provides a way to incorporate automation into the design process across a variety of industries. Innovations in power loom automation can spur technology development. This project focuses so on small businesses in the energy sector. This reduces the amount of workrequired by the mechanical loom industry to know the output of each loom. They provide information about all kinds of events and various information through the use of the web. He uses the system to collect all the data of all the minions for a month, thus reducing people's effort and time. Therefore for the automatic transformation of small industries in the power plant sector. When the thread is cut and there is no thread left on the spool, the machine stops. This is indicated by the LED light. Proximity sensors will be used to continuously monitor the machine's production. Future work will include sending reports to GSM moderators. In summary, the integration of IoT-based power looms into the textile industry represents a major advance that has the potential to change all aspects of textile production. This new technology has many benefits, including improved performance, improved product quality, cost savings and better applications.

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