

Intelligent Store Room For Industries Using E – Kanban System

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Abstract: - E-Kanban system is based on monitoring technique. This system monitors how much quantity or component taken and weight of that component. Load cell is act as a sensing device which converts force to an electrical signal in which all information about volume and component weight is given. Load cell is connected to each rack in store room or stock room are placed .A model is digital measurement. It is used to check quantity of component placed in rack in store room. In this system all results come automatically. This is eco-friendly system. Smart RFID Card is given to employee will be used for taking component from store room or stock room and if any employee wants to issue any component without insertion of RFID Card then it is not possible, because without insertion of RFID Card anyone lifts component from rack then alarm sound automatically. This system is helpful in manufacturing industries.

Keywords:- LCD,RFID Card, RFID Reader, Keypad, Load Cell, Signal conditioning, GSM etc.

I. INTRODUCTION

In all industries there is lost of time on purchasing and issuing component from stock room always while manufacturing of new products means manual operation is waste of time. These time wastage are eliminated in our system. Our system is about to monitor the weight of component. From the weight of component load cell calculate volume of component.

On important information about employee that is name, address, department where they are working their all details are recorded manually at first stage. On LCD all information about stock remaining will automatically display. Smart RFID Card used as a entry pass in stock room. While malfunctioning by any employee alarm starts sounding. Number of component taken are calculated in order to maintain stock information .

Since in number of industries when employee wants to take component from store room, he has to do manual entry like time of entry in store room, which component wants to take, his name and time of exit. After that he has to count number of component. This all process is just waste of time. This system is one of the solution over this problem. We used electronic Kanban technique in this system. It is different from traditional Kanban. In traditional Kanban there is use of barcodes and electronic message and this is replaced by

RFID card and GSM in E-Kanban system. In Kanban all work is identified by barcode reader using Kanban card. And in E-Kanban system RFID and GSM is used. Using RFID card and reader all work is done.

The main advantage of E-kanban is that it transfer information from one department to another using RFID.

II. LITERATURE AND TECHNOLOGICAL SURVEY

In International Journal of Scientific and Research Publications,“E KANBAN SYSTEM” published by Mr. RajuNaik& team. In this paper author discussed about important difference between the electronic Kanban and traditional card based Kanban system is to work more effectively and efficiently with a lean process. The transparency of supply chain is very much increased with the implementationof e-Kanban system. The gives an assurance of handling with high amount of materials in a good way without losing cards and with changing demand with the customers, the system reacts more flexibly. It very important to take into considerations of the financial things of the system; it involves high investments because of the expensive terminals and other expenses connected with the IT department. Also, for the successful implementation, the communication within the IT departments, logistics and production is very important. E-Kanban is very

big successful, if the implementation of the system is well-done, as it helps in optimization of the process.

III. METHODOLOGY

When employee wants to take component from store room, he has to swap RFID Card on RFID reader. After swapping of RFID Card, employee gets access code on his mobile through GSM. At same time, HOD gets information about employee that he wish to take the component. After that employee gives access code by typing using keypad, then and only then he can take component from rack. As soon as he take one or more component load cell will calculate weight of quantity of component.

Load cell is act as a transducer it will convert force to electrical signal which has information about component. Output of load cell is in the form of electric signal and it is very mili volt. Therefore it need amplification to use this information ADC will convert analog electric signal into digital signal. This is then given to microcontroller, LCD gets all information about weight and quantity number present in rack through microcontroller. When any employee take component without insertion of RFID Card then controller pin gets high and transistor gets on, buzzer gets connected to ground and alarm gets start sounding.

IV. WORKING PRINCIPLE

When employee wants to take component he has to manual entry. For example he want to take 100 resistor from rack then he has to count all resistor upto 100. After that in companies register he has to do entry that he will take 100 resistor and all information like his name, department, time of entering and exit. This is all waste of time. In E- Kanban system after swapping RFID Card he can take component and load cell will calculate it. It decrease time There is no need of entries and HOD will get all information about this issuing of component in 90sec to his mobile.

V. SYSTEM STRUCTURE

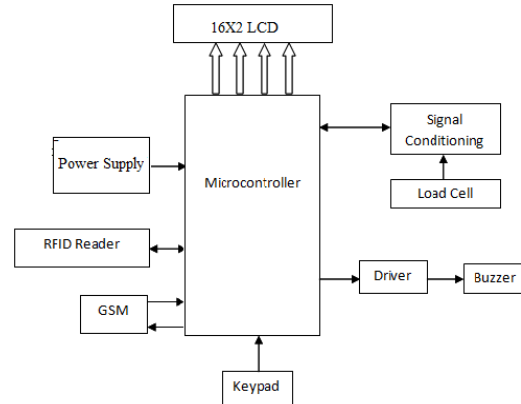


Fig. Elements of E-kanban system

VI. BLOCK DIAGRAM DESCRIPTION

PIC Microcontroller:-

A PIC microcontroller is processor with built in memory and RAM. In PIC there is inbuilt ADC. Data memory is 8 bit,16 bit. The PIC16F877A features 256 bytes of EEPROM data memory,there is a self programing, 2 Comparators, 8 channels of 10-bit Analog-to-Digital (A/D) converter, 2 capture/compare/PWM functions.

Load cell:-

heart of any weighting system is a load cell. While they are not existing to watch. Load cell are highly accurate transducers which provides the users information not generally Obtainable by other technology due to commercial factors. Rack consist of load cell over which products are placed. Load cell measure the weight of products and calculate its volume, which is given to signal conditioning

RFID-Reader:-This is low frequency (125KHz) RFID Reader with serial output with range of 8-12cm. It is compact unit with built in antenna and can be directly connected to the PC using RS-232Protocol.

Signal Conditioning:-

Signal Conditioning means manipulating of an analog signal to meet the requirements of the next stage for further processing. Most common use is in Analog-to-digital converters. There is a sensing stage and a processing stage in control application. Operational amplifiers are commonly employed to carry out the amplification of the signal in the signal conditioning stage.

Buzzer:-

Alarm starts sounding in case when someone tries to lift the products without insertion of smart card.

4*4 Matrix Keypad:-

Keypad is a part of HMI or human machine interface and play really important role in small embedded system where human interaction or human input is needed.

Advantages

- ◆ Minimize material storage,
- ◆ Time consuming.
- ◆ Improve supply chain transparency.

V. CONCLUSION

The E- Kanban replaces manual Kanban. It will eliminate wastage of time. The study suggests that while planning an electronic kanban system the most of the original kanban ideas should be followed. However an electronic kanban system gives possibilities to solve some of the limitations of kanban system are model mix change management and failure recovery. The support for continuous improvement should be build into system to achieve the effectiveness of original kanban and JIT-ideas.

REFERENCES

- 1) Design and Analysis of Lean Production Systems, R. Askin and J. Goldberg, John Wiley and Sons, Inc. 2002.
- 2) Introduction to materials management, By J. R. Tony Arnold and Stephen N. Chapman, 5th Edition, Prentice-Hall, Inc. 2004.
- 3) Al-Tahat M.D. and Mukattash A.M. (2006) Design and analysis of production control scheme for kanban-based JIT environment, Journal of the Franklin Institute, 343, 521-531.
- 4) Gupta, S.M., Al-Turki, Y.A.Y. and Perry, R.F. (1999) Flexible Kanban system, International Journal of Operation & Production Management, 19, 1065-1093
- 5) C.C. Aggarwal, ed., Data Classification: Algorithms and Applications. A. Biem, Chapter 8, "Neural Networks: A Review". CRC Press. 2014.
- 6) J. Bollinger, Bollinger on Bollinger Bands. McGraw Hill, 2002. http://ersatz.systems.com/current_book.pdf, 2015.
- 7) C. James III, A reusable database engine for accounting arithmetic, Proceedings of the Third Biennial World Conference on Integrated Design & Process Technology, 2: 25-30, 1998.
- 8) C. James III, Proof of four valued bit code (4vbc) as a group, ring, and module. World Congress and School on Universal Logic III, 2010
- 9) IEEE paper on "SIMULATION OF ELECTRONICS MANUFACTURING SYSTEMS WITH TWO-CARD KANBAN" published by author Kittipong Wiwakanond and Jim Lee.
- 10) IEEE paper on "MULTI-ECHELON INVENTORY OF SUPPLY CHAIN" published by author Li Guojia, Wang Dingwei.
- 11) IEEE paper on "THE PRINCIPLES AND PLANNING PROCESS OF AN ELECTRONIC KANBAN SYSTEM" published by I.A. Kouri, T.J. Salmimaa, I.H. Vilpola
- 12) <http://electronicsforyou.com>
- 13) <http://www.scihub.com>
- 14) <http://ieeexplorer.com>
- 15) http://ersatz.systems.com/current_book.pdf