

PLC Scada Based Automatic Inventory Management System

Supriya Sanjay Lahare
Instrumentation and Control Engineering
Savitribai Phule Pune University, India

Prathamesh Raju Sonar
Instrumentation and Control Engineering
Savitribai Phule Pune University, India

Avadhoot Ramesh Gawali
Instrumentation and Control Engineering
Savitribai Phule Pune University, India

Sanket Sunilkumar Bangar
Instrumentation and Control Engineering
Savitribai Phule Pune University, India

Abstract:- Stock Management System is imperative to guarantee quality control in organizations that handle exchanges spinning around buyer merchandise. Without appropriate stock control, an extensive retail location may come up short on stock on a vital thing. A decent Inventory Management System will caution the retailer when the time has come to reorder. Stock Management System is likewise a vital methods for naturally following substantial shipments. For instance, if a business orders ten sets of socks for retail resale, however just gets nine sets, this will be evident after assessing the substance of the bundle, and mistake isn't likely. Then again, say a distributor orders 100,000 sets of socks and 10,000 are missing. Physically checking each combine of socks is probably going to bring about blunder. A computerized Inventory Management System limits the danger of blunder. In retail locations, an Inventory Management System additionally helps track robbery of retail stock, giving important data about store benefits and the requirement for burglary counteractive action frameworks. Computerized Inventory Management System work by examining a scanner tag either on the thing. A standardized tag scanner is utilized to peruse the standardized tag, and the data encoded by the standardized identification is perused by the machine. This data is then followed by a focal PC framework. For instance, a buy request may contain a rundown of things to be pulled for pressing and delivering. The Inventory Management System can serve an assortment of capacities for this situation. It can enable a specialist to find the things on the request list in the distribution center, it can encode shipping data like Management System make it easy to find and break down stock data.

In this Project we are proposing a framework for stock administration which will be a proficient approach than existing framework or gadgets. The fundamental reason to make such an instrumentation arranged venture is to outline a model of mechanized stockpiling and dissemination framework for little loads and to lessen the human exertion and la.

Keywords:- Stock management, computerized inventory management system, stock following data, human exertion and labor.

I. INTRODUCTION

This basic and most popular type of controller has been around for over 50 years. Developed in the 1960s to replace relay-based systems, early programmable logic controllers (PLCs) controlled simple tasks, required dedicated terminals for programming, had very limited storage capacity, and lacked remote I/O or communications capabilities. Most industrial operations use the programmable logic controllers to give commands in the assembly line. Which can be used to control repeated functions based on the data they receive from sensors and the programming logic. For example, if a chemical is heated at set point temperature, a temperature switch might close when the correct temperature is reached. The PLC takes the signal from the temperature switch and is programmed to then shut off the heater. Alarms are handled in the same way. Most controllers with newer technologies can be reprogrammed easily to change operations in the design. It is difficult to change production process due to the lack of data analysis and manage them according to the time when available. This is because of the limited capabilities of sensors and actuators. Important information about the details of the process may not be detected, is not readily available for analysis and cannot be captured and stored easily. There were disconnections available between PLC and sensor for data storage and data capture. We could not be identified Quality control factors in the starting of the production process because the information about possible deviations and recording in the process variable is difficult. PLCs communication may have been limited to range within operational areas i.e. in production lines or within the manufacturing process facility. Now a days IOT concept is an important trend that influences all aspects of the industrial automation, PLCs are becoming urbane and gives features that provides interconnection and communication beyond the original capabilities.^[1] Smart Inventory management system which fulfills the requirement of typical analysis in various godowns. The perfection of hardware, software, data, procedures and peoples makes the inventory management successful. Inventory affects all operating activities like manufacturing, sorting, sales etc. so the amount of opening inventory and closing inventory should be sufficient and accurate.

In any industry the storage & distribution of any material or product is very important. Automation plays important role in every field. It emphasizes on making any process automatic that increases productivity, accuracy and safety by reducing

time and human effort vital role in the world of automation and instrumentation. The main purpose of the project is to get knowledge of design and mechanism. The design is an environment and user friendly and uses simple properties such as mechanical and automation properties which use PLC , SCADA and HMI system. The design is done so well that knowledge of designing, mechanism and gives analysis and accuracies are increased. In order to reduce human effort, we planned to create material storage and handling system.

PLC plays an important role in the world of automation and instrumentation. The design is done so that knowledge of designing, mechanism and forces analysis are increased. In order to reduce human effort, we planned to create smart inventory management system. The benefits of this System include better inventory control, larger inventory and storage capacities, and faster and more effective materials handling. Materials handling and sorting are always been a challenging job in any manufacturing environment being a non-value added process and potentially not secured in certain industries (ex. steel, chemical, aerospace). The paper is presented into several sections

II. LITERATURE SURVEY

A. *Techniques of inventory control*

Inventory control refers to a process of ensuring that appropriate amount of stock are maintained by a business, so as to be able to meet customer demand without delay while the costs associated with holding stock should be maintained at minimum level. Inventory control signifies a planned approach of finding when to shift, what to shift, how much to shift and how much to stock so that costs in buying and storing can be minimum without interrupting production or affecting sales and production. To solve these problems of inventory management various techniques are there. ^[2]

These techniques are divided into two categories – modern techniques and traditional techniques. (1) MODERN TECHNIQUES (a) Economic Order Quantity (EOQ) (b) Re-Order Point (ROP) (c) Fixing Stock Levels (d) Selective Inventory Control ^[3]

(2) TRADITIONAL TECHNIQUES (a) Inventory Control Ratios (b) Two Bin System (c) Perpetual Inventory System (d) Periodic Order System

Inventory management continues to evolve. Like many other processes, the evolution is driven by the need for greater efficiency and accuracy. Today, suppliers have the ability to use real time, cloud based software, to track and manage inventory and shipments.

B. *Manual Counting*

Stock administration was extremely crude before the Industrial Revolution. A portion of the main individuals to depend on stock administration were retailers and dealers, who might check the quantity of units toward the finish of every day, decide what number of were sold and do their best to figure future needs. The procedure of physically checking the

physical stock would frequently take hours or even days, and as you can envision, it wasn't extremely precise. ^[4]

C. *Punch Card System*

The Industrial Revolution totally changed the stock administration process as effectiveness and large scale manufacturing turned into the primary objectives of organizations. The punch card framework was the "following huge thing", planned by a group at Harvard University in the mid 1930's. The little gaps in sheets of paper permitted punch cards to relate with list things that were decipherable by PCs. The data would be passed to workers in the storeroom, who might then convey the thing in advance to the client. Organizations could monitor which items were being requested and record stock and deals information in light of the punch cards clients rounded out. Lamentably, this procedure was excessively costly and too moderate, making it impossible to remain generally utilized and to stay aware of rising business challenges. ^[5]

D. *The Modern Bar Code*

The principal rendition of the cutting edge standardized tag was made in the 1940's and 1950's and was made out of bright light-touchy ink and peruse to track things available to be purchased. As innovation enhanced in the 1980's and 1990's, the standardized identification framework turned out to be more productive, reasonable and broadly embraced. The implantation of further developed PCs and programming permitted the advanced standardized identification to thrive for quite a long time. Now, stock following by hand was supplanted by checking items, however contributing data into PCs was as yet done by hand. ^[6]

E. *Radio Frequency Identification*

RFID (radio recurrence distinguishing proof) innovation has turned into a staple in distribution centers, manufacturing plants, and retail locations amid the 2000's. RFID utilizes a microchip to transmit data about an item, for example, sort, maker and serial number, to an information gathering gadget. The presentation of RFID innovation implies that organizations never again expected to include information by hand and scanner tag peruses could in a split second refresh their databases. The innovation is additionally a distinct advantage for merchants since they can guarantee their items are legitimately accessible, and they have steady access to continuous deals information. ^[7]

III. METHODOLOGY

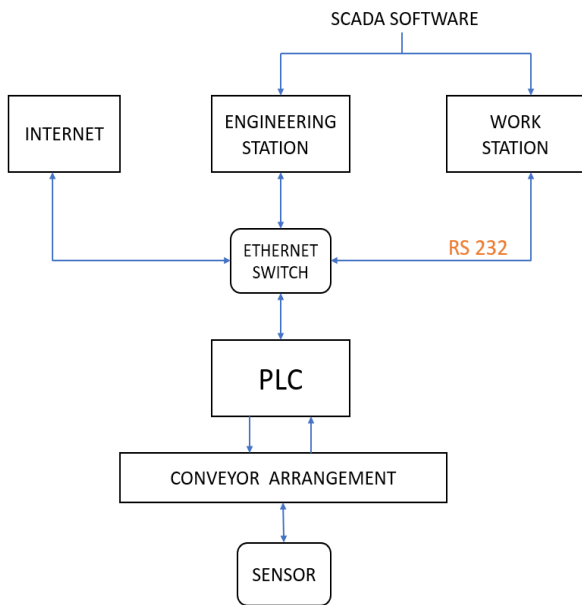


Fig 1:- Block diagram of Proposed System

The present day Supervisory Control and Data Acquisition (SCADA) frameworks comprising of SCADA has, Remote Terminal Units (RTUs) and field gadgets screen and control process gear and frameworks from different areas and trade information from different conveyed control frameworks along the neighborhood and wide territory systems. Fundamental idea of our paper is we will read the electrical information by the utilization of PLC and SCADA. At that point the whole information will be shown on SCADA. As per the readings controlling moves will be made by the operator. The goods in the inventory will be loaded on the conveyor. SCADA will give control signal to separator unit which will divide the goods in individual sectors. Sensing technology will depend upon product of the industry.

➤ **Algorithm**

- Start
- Enter the total number of product
- Initialize the quantity value of required product for sector A,B,C
 For example-A=3, B=2, C=2
- Check the value of i over the number of item
- If $0 < i \leq 3$ then A output flag=1 and $A=A+1$
- If $3 < i \leq 5$ then B output flag=1 and $B=B+1$
- If $5 < i \leq 7$ then C output flag=1 and $C=C+1$
- Else set flag=0
- Stop

IV. CONCLUSION

We have implemented a compact, economic and user friendly 'Automatic inventory management System'. This paper has proposed an application of automation illustrating a PLC and SCADA based automatic inventory management system. Aim of the project is to develop a system that can help to extend its use over wider area. We have got the experience

of brainstorming for logical thinking to developing the program.

V. ACKNOWLEDGEMENT

We accept this open door to express our profound feeling of appreciation to our guide Prof. N. L. Patil (Government College Of Engineering And Research Awasari) for her important direction and motivation notwithstanding her bustling timetable. She gave herself in finishing our errand with the commendable perfection. She has taken keep and individual enthusiasm for giving us steady support and convenient recommendations additionally to our HOD Dr. M. R. Bongulwar for lively consolation and prominent direction.

REFERENCES

- [1]. The trends in automation: The internet of Things by AXIOMTEK.
- [2]. <http://info.odysseydcs.com/blog/the-evolution-of-inventory-management>
- [3]. http://shodhganga.inflibnet.ac.in/bitstream/10603/25185/1/0/10_chapter-3.pdf
- [4]. <https://bizfluent.com/info-8007357-difficulties-using-manual-inventory-system.html>
- [5]. <https://money.howstuffworks.com/how-inventory-management-systems-work1.html>
- [6]. <http://www.waspbarcode.com/buzz/6-reasons-implement-inventory-management-barcodes/>
- [7]. A review of RFID technology and its managerial applications in different industries Xiaowei Zhu a, Samar K. Mukhopadhyay b, *, Hisashi Kurata c a College of Business and Public Affairs, West Chester University of Pennsylvania, West Chester, PA 19383, United States b SungKyunKwan University – GSB, Jongno gu, Seoul 110-745, Republic of Korea cGraduate School of International Management, International University of Japan, 777 Kokusai-cho, Minami-Uonuma city, Niigata 949-7277, Japan.
- [8]. International Journal of Computational Intelligence Research ISSN 0973-1873 Volume 13, Number 6 (2017), pp. 1361-1365 © Research India Publications <http://www.ripublication.com>
- [9]. Inventory control system Renee Smith Rachel Ericson Savanna Millen Ezekiel Alva Manny Valdez 5/11/2009
- [10]. <file:///C:/Users/HP/Desktop/project/review%20literature.pdf>
- [11]. <http://onlineaccountreading.blogspot.in/2015/01/inventory-management.html#.WrAWF-hubIV>
- [12]. International Journal of Innovative Research in Computer and Communication Engineering (An ISO 3297: 2007 Certified Organization) Vol. 4, Issue 2, February 2016 Copyright to IJIRCCE DOI: 10.15680/IJIRCCE.2016. 0402138 2380 The Survey on Inventory Management System for Supermarket Using Android Application.
- [13]. A LITERATURE REVIEW ON MODELS OF INVENTORY MANAGEMENT UNDER UNCERTAINTY Serhii ZIUKOV Yurii Fedkovych Chernivtsi National University 2 Kotsjubynskiy str., Chernivtsi 58012, Ukraine E-mail: s.zyukov@chnu.edu.ua doi:10.13165/VSE-15-5-1-03.