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# Production Line Monitoring Using IOT

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**ABSTRACT:** The main objective of the current study is to analyze real time production monitoring systems (PMS) and to offer better solutions for small and medium sized production companies. PMS is the alternate to manual data collection and should capture most of the required production data without human intervention. Practical part of the study is focused on selection of suitable PMS, its adaptation and mapping manufacturing process (determining key factors, etc.). As consumption patterns become increasingly sophisticated and manufacturers strive to improve their competitiveness, not only offering higher quality at competitive costs, but also by providing a broader mix of products, and keeping it attractive by launching successively new products, the turbulence in the markets has intensified. This has impelled leading manufacturers to search the development of alternative production systems supposed to enable them operate more responsively. This paper discusses the trend of abandoning the strategy of relying on factory automation technologies and conveyor-based assembly lines, and shifting towards more human-centered production systems based on autonomous work-cells, observed in some industries in Japan (e.g., consumer electronics, computers, printers). Since the mid-1990s. The purpose of this study is to investigate this trend which is seemingly uneconomic to manufacturers established in a country where labor costs are among the highest in the world, so as to contribute in the elucidation of its background and rationality. This work starts with a theoretical review linking the need to cope with nowadays' market turbulence with the issue of nurturing more agile organizations. Then, a general view of the diffusion trend of work-cell based assembly systems in Japanese electronics industries is presented, and some empirical facts gathered in field studies conducted in Japan are discussed. It is worth mentioning that the abandonment of short-cycle-time tasks performed along conveyor lines and the organization of workforce around work-cells do not imply a rejection of the lean production paradigm and its distinctive process improvement approach. High man-hour productivity is realized as a key goal to justify the implementation of work-cells usually devised to run in longer cycle-time, and the moves towards this direction has been strikingly influenced by the kaizen philosophy and techniques that underlie typical initiatives of lean production system implementation.

## I. INTRODUCTION

As consumption patterns become increasingly sophisticated and manufacturers strive to improve their competitiveness not only offering quality products at competitive costs, but also by providing broader mix of products and keeping it attractive by launching new products in succession, the turbulence of the markets has intensified. This fluctuating nature of the market demands has impelled leading manufacturers to search the development of alternative production systems supposed to enable them operate more responsively under such circumstances (Katayama & Bennett, 1996). The purpose of this paper is to discuss the turnaround currently observed in the Japanese electronics industries which are migrating to more human-centered final assembly systems, in an attempt to elucidate its backgrounds and rationality. Driven by their growth-oriented long-term business strategies and the need to remain competitive in global markets, but constrained by issues such as the shortage of younger workers willing to get shop-floor jobs, and very high labour costs, manufacturing industries in Japan have undertaken great efforts in the development of Advanced Manufacturing Technologies (AMT's) and in the adoption of factory automation resources. As a result of such massive investments, the production processes in many industries in Japan accomplished very high rates of automation. An indication of this is that according to United Nations Economic Commission for Europe (UNECE) and the International Federation of Robotics (IFR), in 1997, the operational stock of multipurpose industrial robots in Japan achieved the peak of 413,000 units (UNECE-IFR, 2003). Specifically in the motor vehicle industry, the same source pointed out that in 2002 the Japan's auto makers with approximate 1,700 multi-purpose industrial robots per 10,000 workers featured the world's heister implement a new way of doing business. Also, the result of changes can be seen earlier that simplifies the research. In a fiercely competitive market, companies cannot afford the waste of time and resources to perform work that can be done in a better and faster way with advanced solutions. One of the advanced solutions can be a real time PMS. It is a production tool that collects and distributes necessary data when various events occur in a shop floor. The main aim of a PMS is to prevent small disturbances having large effects. In this way a PMS will decrease the

number of unscheduled production stops, improve cost-efficiency and simplify the production planning. The task of a PMS is to collect and distribute real time data of events on the shop floor. This data must be understandable and useful for decision making. Monitored data should help the production team to respond timely on the events that may affect the desired result. Such system should also alarm and inform respective department concerning all recognized faults. PMS is not just display boards that show production data, it also has highest density of robots. SMEs are more flexible comparing to larger companies and can have reporting and administration module, where stored data can be analyzed to find trends, estimations and projections for easier decision making and production planning. Proactively detected faults will decrease wasted time and improve overall equipment effectiveness

**Aim** The aim of this project is while delivery operations are being held in factories for which produced material is carried out to truck by conveyor belt. Our project helps us to detect the quantity of boxes that have been carried to trucks on conveyor belts.

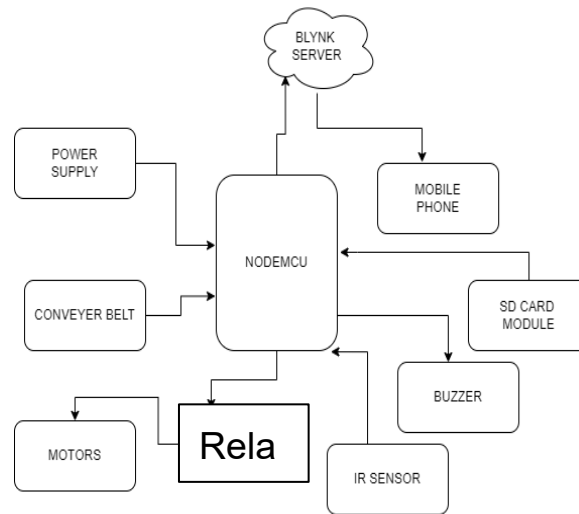
#### Objectives:

- The Gear motor is used for rotating the conveyer belt
- Relay is used for on/off the gear motor
- IR sensors to detect moving boxes on conveyor belt.
- Blynk app for showing data on mobile

## II. LITERATURE SURVEY

- 2.1 **R.S. Ciuo', A. Chen, C.L. Tseng<sup>4</sup>, I.K. Fong, A. Yang, C.L. Lee, C.H. Wu, S. Lin' S.J. Huang', Y.C. Lee', S.G. Chang', M.Y. Lee** states that in semiconductor industries fabrication process of wafer fault detection become critical as most problems reveal themselves first on the equipment performance and much later on the water quality [1]. They focused on method of dashboard display of real time data for providing an easy reading of equipment's overall status; their approach in paper is towards equipment's overall health.
- 2.2 **In paper Wireless Industrial Monitoring and Control using a Smart Sensor Platform [2] the author Harish Ramamurthy, B. S. Prabhu and Rajit Gadh** presents the design and implementation of a wireless smart sensor platform targeted for instrumentation systems and predictive maintenance. They have carried out tests to determine system performance for both the instrumentation and maintenance applications, and as the results suggest were quite satisfactory. The experimental results show that a sustained near-real-time system can be set up with the smart sensor nodes and the versatility of the smart sensor interface can be used in implementing diverse applications.
- 2.3 **Author S.Boopathi, M.Jagadeshraja, L.Manivannan and M. Dhanasu** in their paper GSM based Generator Monitoring System for steel Melting Shop[7] implements the ideal solution to the problems caused in situations when a wired connection between a remote appliance/device and the control unit might not be feasible. But the system is based on GSM module the time for receiving messages may fluctuate due to the public GSM network traffic which is actually a major drawback of a system.

## III. METHODOLOGY



### Description

In these projects we used node much as a microcontroller. The IR sensor, SD module, and conveyor belt is connected as an input device to the microcontroller. the output Relay and buzzer are the output. motors are connected as output devices to relay. Blynk app is connected to node MCU using IOT.

The aim of this project is while delivery operations are being held in factories for which produced material is carried out to truck by conveyor belt. IF this conveyor belt gets loaded to match. it will create a huge mess. Which will also damage boxes and yield losses to the company. Our project helps us to detect the quantity of boxes that have been carried to trucks on conveyor belts. If it gets too much on a single belt. The previous belt will stop which helps us to avoid such situations as well. In this project we are using node much as a microcontroller. We are also using a gear motor to move the conveyor belt. & Using relay to on/off gear motor we are using 3 IR sensors to detect moving boxes on conveyor belt. To show data on mobile we are using the blink app. Blynk app will show data on the mobile as well it will alert the person about the hazard/ or notify the person about the incident.

## IV. CONCLUSION AND SCOPE FOR FUTURE STUDY

### CONCLUSION

In this dissertation we have developed a system which will do Real time machine breakdown status monitoring and give Alert for effective communication also which will show the status of all machines in one view for transparency in information at every level industrial management. This kind of approach leads to a unique system with different solutions along with Internet of things. The basic purpose by developing this system is to improve industrial machines monitoring resulting in productivity through will be gained. On the other hand, installing very expensive systems to monitor, collect and store megabytes of data is not needed each day so it will save the cost and time to repair. In addition, we have developed a machine model which will be Add ON to any kind of industrial manually operated equipment. So, whether the computer/desktop is available or not the breakdown alert can be reported via Node 1 Module.

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