

Design and Develop an E-Kanban System Based on Lean Manufacturing Concepts to Optimize Supply Chain Management in Apparel Industry in Sri Lanka.

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Apparel sector, a fast-growing industry uses several Lean manufacturing concepts. Kanban, is considered as a popular method which is used to reduce unnecessary costs and wastage of the production process. It is an efficient method of managing supply chain process in apparels. Most of the factories do not utilize the technology and advancement in technology to the fullest potential in material handling although many factories follow manual Kanban and Lean manufacturing concepts. This research was conducted with the intention of designing and developing an e-kanban system. As a results of obtained from a statistical survey, background study and interviews, 87.5% expected to modify the existing system. Accordingly, Kanban system was converted into Electronic kanban system (E-kanban) using Radio-Frequency Identification (RFID) technology. Arduino mega, RFID module and RFID tags were used to design the system. To input data to the system, the C# interface was used. Then the number of Kanban to write data to the RFID tags were automatically calculated. RFID tags use filtering to prevent repetition. When the material is moving with the RFID tags in the line, the overall progress in the production process could be easily viewed. The research considers about the economic aspects as it proposes material saving through reducing paperwork and other printing materials. As this system pre-defines all the optimum things to be done, it is expected to reduce the workload and the stress levels of the employees. E-kanban system is strongly recommended in terms of its environmental friendliness. Finally, the concept was tested for user acceptance by conducting a simple survey and interviews. Each feature of the model was accepted by 86.7% of the respondents. Thus, it can be concluded that the system can be used for predictive analysis on decision making with manual and traditional lean concepts.

Keywords: Kanban, E-kanban, RFID, Supply chain management, Lean manufacturing concept