

Internet-Of-Things and Ergonomics, Increasing Productivity and Reducing Waste: A Case Study

Authors : V. Jaime Contreras, S. Iliana Nunez, S. Mario Sanchez

Abstract : Inside a manufacturing facility, we can find innumerable automatic and manual operations, all of which are relevant to the production process. Some of these processes add more value to the products more than others. Manual operations tend to add value to the product since they can be found in the final assembly area or final operations of the process. In this areas, where a mistake or accident can increase the cost of waste exponentially. To reduce or mitigate these costly mistakes, one approach is to rely on automation to eliminate the operator from the production line - requires a hefty investment and development of specialized machinery. In our approach, the center of the solution is the operator through sufficient and adequate instrumentation, real-time reporting and ergonomics. Efficiency and reduced cycle time can be achieved thorough the integration of Internet-of-Things (IoT) ready technologies into assembly operations to enhance the ergonomics of the workstations. Augmented reality visual aids, RFID triggered personalized workstation dimensions and real-time data transfer and reporting can help achieve these goals. In this case study, a standard work cell will be used for real-life data acquisition and a simulation software to extend the data points beyond the test cycle. Three comparison scenarios will run in the work cell. Each scenario will introduce a dimension of the ergonomics to measure its impact independently. Furthermore, the separate test will determine the limitations of the technology and provide a reference for operating costs and investment required. With the ability, to monitor costs, productivity, cycle time and scrap/waste in real-time the ROI (return on investment) can be determined at the different levels to integration. This case study will help to show that ergonomics in the assembly lines can make significant impact when IoT technologies are introduced. Ergonomics can effectively reduce waste and increase productivity with minimal investment if compared with setting up to custom machine.

Keywords : augmented reality visual aids, ergonomics, real-time data acquisition and reporting, RFID triggered workstation dimensions

Conference Title : ICAEED 2018 : International Conference on Applied Ergonomics and Ergonomics in Design

Conference Location : Paris, France

Conference Dates : January 25-26, 2018