Improvement of the Mizusumashi System in an Electrical Devices Company: a Case of Transdisciplinary University-Business Cooperation

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Abstract. In the 1st year of the Master in Industrial Engineering and Management of the University of Minho (Portugal), teams of students develop semester-long UBC (University-Business Cooperation) projects involving four course units, according to the PBL (Project-Based Learning) methodology. This paper focuses on the project developed by a team of eight students in an electrical devices company, more specifically in the mizusumashi system (logistic train), responsible for supplying components to the assembly lines/cells, whose performance revealed some problems. The team carried out a detailed analysis/diagnosis of the current system, gathering data through surveys, interviews, and direct observations on the shopfloor. Several problems were identified, namely in the loading process of the mizusumashi, which takes place in the so-called dynamic warehouse (e.g., disorganization of components and picking inefficiencies), as well as in the routes travelled (e.g., imbalances and deficient/absent signaling). Cases of overloading the mizusumashi and problems in its physical structure were also revealed, with consequences at the ergonomic level. All this causes delays in the supply of components to the assembly lines/cells. To tackle these problems, the team developed and evaluated several improvement proposals, including modification of the routes signage (using visual management techniques), reorganization/adjustment of the mizusumashi carriages, reorganization of the location of components in the dynamic warehouse, and introduction of an RFID (Radio Frequency IDentification) system to streamline the picking processes. These proposals are expected to eliminate mizusumashi overload and component-scanning times, decrease the number of transports and movements, reduce route delays, and reduce the risk of work-related musculoskeletal disorders (WMSD).

Keywords. Mizusumashi, visual management, ergonomics, warehouse management, RFID

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