

## Automated Method Time Measurement System for Redesigning Dynamic Facility Layout

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**Abstract :** The dynamic facility layout problem is a really critical issue in the competitive industrial market; thus, solving this problem requires robust design and effective simulation systems. The sustainable simulation requires inputting reliable and accurate data into the system. So this paper describes an automated system integrated into the real environment to measure the duration of the material handling operations, collect the data in real-time, and determine the variances between the actual and estimated time schedule of the operations in order to update the simulation software and redesign the facility layout periodically. The automated method- time measurement system collects the real data through using Radio Frequency-Identification (RFID) and Internet of Things (IoT) technologies. Hence, attaching RFID- antenna reader and RFID tags enables the system to identify the location of the objects and gathering the time data. The real duration gathered will be manipulated by calculating the moving average duration of the material handling operations, choosing the shortest material handling path, and then updating the simulation software to redesign the facility layout accommodating with the shortest/real operation schedule. The periodic simulation in real-time is more sustainable and reliable than the simulation system relying on an analysis of historical data. The case study of this methodology is in cooperation with a workshop team for producing mechanical parts. Although there are some technical limitations, this methodology is promising, and it can be significantly useful in the redesigning of the manufacturing layout.

**Keywords :** dynamic facility layout problem, internet of things, method time measurement, radio frequency identification, simulation

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