SERVER ASSEMBLY PROCESS OPTIMIZATION USING GROUP TECHNOLOGY
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ABSTRACT
To have a competitive advantage in the computing assembly industry, it is essential to have an agile facility to assemble high performance computing clusters (or supercomputers). This agility will allow delivery to the customer in the shortest possible time. Supercomputers consist of a large network of servers to communicate and execute the computations. The organization studied in this effort is a leader in delivering high performance computing solution to their customers. The server assembly process consists of a large variety of components that need to be assembled into the server based on different configurations and customer requirements. An efficient assembly process is needed to produce the product per customer needs, requirements, and expectations. The current state is a single unit assembly (SUA) process. SUA is found to have inefficiencies due to the presence of non-value added activities such as unnecessary motion, longer cycle time, excess inventory, excess transportation, and defects.

There is limited research that addresses the problems associated with a server assembly process for high performance computing where multiple products are produced, each having different testing protocols. This thesis introduced a real organizational case study of the process optimization for a server assembly line by means of adapting group technology (GT) to replace
SUA. The study was performed using two methods. The first method was to conduct a time study for both SUA (current state) and GT (proposed state). The strategy helped to determine the impact of GT method on the assembly line in order to meet customer demand. The study will also determine the takt time which will help to improve production planning. The second method is to develop a simulation model for the two different assembly methods. The results obtained from the simulation model will help to evaluate the different assembly processes.

The empirical results drawn from the study serve to determine that the GT assembly method has helped to improve overall productivity of the assembly line and reduce waiting time between the assembly stations. Additionally, the GT method has helped to convert the process into a lean assembly line by adapting process standardization and reducing lean wastes.