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# Improvement Strategies of Process Time

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***ABSTRACT :*** *In this study, Six Sigma was used to improve the operation process of Plant A. Process Mapping and Plato were used to analyze the process and data to find out the main factors that slow down the operation, and improvement measures were proposed to improve the performance of operation management. Through the demonstration of Plant A, it has successfully shortened the processing time and improved the performance of operation management.*

***KEYWORDS-****Six Sigma, process time, capacity*

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## I RESEARCH BACKGROUND

Under the pressure of a highly competitive environment, it is the focus of the business strategy of many enterprises to use Six Sigma activities to quickly develop products that meet customers' needs. Business processes involve procedures, equipment, control methods, time, employees, and so on, each of which affects the processing time. The purpose of this study is to help Plant A to shorten the processing time. In this study, the Six Sigma system tool was used to find out the factors that slow down the operation by Process Mapping, Plato and analysis data, and improvement measures were proposed.

## II LITERATURE REVIEW

Six Sigma is a business process method developed by Motorola in 1980 (Franza and Chakravorty, 2007). As a management improvement method, Six Sigma focuses on prevention rather than improvement (Harry & Schroeder, 2000). Howell, FedEx, Kodak, Johnson & Johnson, Toshiba and other companies have achieved good results due to the introduction of Six Sigma (Pande et al., 2001). Mast (2003) believed that Six Sigma was a customer-oriented approach that emphasizes quantitative approaches and prioritization of savings as a way to make decisions. Antony & Banuelas (2002) believed that the success factors of Six Sigma in the industry include the participation of management, excellent corporate culture, employee education and training, emphasis on customer needs, rapid completion of projects, utilization of resources and teams, the use of statistical methods for improvement and continuous improvement to improve customer satisfaction. Snee and Hoerl (2003) put forward four implementation steps of Six Sigma: (1) carry out Six Sigma activities; (2) manage Six Sigma effectiveness; (3) maintain and measure Six Sigma effectiveness; (4) make Six Sigma become the corporate culture. Lynch et al. (2003) pointed out that the five major steps to achieve Six Sigma are Define, Measure, Analyze, Improve and Control. Slater (2000) sorted out the Six Sigma steps performed by General Electric as follows: (1) Measurement: measure each operation step and operation process; (2) Analysis: analyze each operation step and operation process; (3) Improvement: strive to improve each operation step and process; (3) Control: after the operation process has been improved, it should be strictly controlled to maintain it. This study applied the five steps of Six Sigma proposed by Lynch et al. (2003) to shorten the processing time of Plant A and improve its performance.

## III CASE STUDY

To shorten the processing time, improve the production capacity and increase the overall competitiveness of the company, Plant A wanted to use the Six Sigma system tool to re-evaluate the process through Process Mapping and Plato. The implementation steps of Six Sigma include Define, Measure, Analyze, Improve and Control.

(1) Process mapping was carried out to find out the operations that affect the overall process. Based on the data analysis results, it was found that the main processes that affect the processing time of Plant A include inspection and packaging operations.

(2) In this study, Plato was used to identify the factors affecting the inspection and packaging time. Through the evaluation, it was found that the main factors affecting the inspection time were the old inspection equipment and

insufficient equipment. The main factors that affect the packaging time are uneven labor distribution and incomplete inspection (the presence of defective products will lead to the delay of final inspection).
(3) The main factors affecting the inspection time were the old inspection equipment and insufficient equipment. The main factors that affect the packaging time are uneven labor distribution and incomplete inspection. According to the analysis, the manufacturing bottleneck was found in the inspection and packaging work. Aiming at the manufacturing bottleneck, the improvement measures were proposed to shorten the processing time. The improvement measures include: (1) strengthen education and training, reduce the defective rate of each station, and reduce the repeated work; (2) in terms of inspection operations, it is suggested to improve the utilization rate and maintenance of equipment; (3) reduce the uneven distribution of personnel, dispatch inspectors to support packaging workstations.
(4) After the implementation of the above improvement measures, the total operation time was shortened by 230 minutes. Under the condition that the number of operators remains unchanged, the reduction of working time helps to indirectly reduce the cost and increase the output.
(5) In this study, after the company implemented the improvement measures, the processing time of the company was shortened and the cost was reduced. In the long term, the Six Sigma method still needs to be used to continuously improve the process of the company

## IV. RESULTS AND CONCLUSIONS

In this study, Six Sigma was used to improve the operation process of Plant A. Process Mapping and Plato were used to analyze the process and data to find out the main factors that slow down the operation, and improvement measures were proposed to shortened the processing time. The improvement measures are as follows: (1) strengthen education and training, reduce the defective rate of each station, and reduce the repeated work; (2) in terms of inspections, it is suggested to improve the utilization rate and maintenance of equipment; (3) reduce the uneven distribution of personnel, and dispatch inspectors to support packaging workstations. After the implementation of the improvement measures, the total operation time was shortened by about 3 hours. The company successfully shortened the processing time, improved the output, reduced the cost and achieved the goal of improving the performance of the operation management.

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