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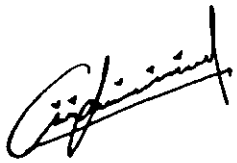

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REDUCTION OF WORK IN PROCESS AND MANUFACTURING LEAD TIME USING VALUE STREAM MAPPING IN THE MEDICAL INDUSTRY

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ABSTRAK

Oleh kerana kesannya yang besar terhadap pertumbuhan ekonomi, industri pembuatan dianggap sebagai salah satu industri yang paling penting. Untuk mengekalkan kepuasan pengguna dalam menghadapi persaingan produk yang semakin meningkat, syarikat mesti mengeluarkan barangan berkualiti tinggi pada kadar yang berpatutan dan memenuhi jadual penghantaran. Oleh kerana permintaan produk yang kukuh dan matlamat syarikat untuk meningkatkan kecekapan, syarikat mesti menghapuskan cabaran semasanya, iaitu inventori yang berlebihan, meningkatkan kecekapannya dan mengurangkan masa utama pembuatannya. Ini ialah kajian kes syarikat perubatan yang mengalami masalah dengan masa utama pembuatan yang panjang dan jumlah inventori yang banyak. Matlamat projek ini adalah untuk mengurangkan masa utama pembuatan dan bilangan item yang sedang dijalankan, seterusnya mengurangkan sisa di tingkat pengeluaran Pemetaan Aliran Nilai (VSM) akan digunakan untuk mengenal pasti pembaziran dengan membezakan aktiviti nilai tambah daripada aktiviti bukan nilai tambah dalam proses pembuatan. Untuk meningkatkan barisan pengeluaran perubatan, analisis dijalankan menggunakan pemetaan aliran. VSM semasa dibangunkan dan pembaziran ditemui dengan meneliti barisan pengeluaran sedia ada. VSM berkemungkinan besar akan melaksanakan pembuatan pada masa hadapan dengan membuang pembaziran yang dikenal pasti. Masa utama dikurangkan dengan mengurangkan pembaziran dan inventori juga boleh dikurangkan. Akibatnya, pengguna menerima lebih nilai pada kos yang dikurangkan. Ini akhirnya membawa kepada mendapatkan kelebihan daya saing dalam pasaran yang sudah kompetitif. Untuk menyelesaikan kesukaran, peta keadaan masa hadapan telah dibina menggunakan teknik lean dan kaizen. Lebihan inventori dihapuskan, dan jumlah masa kitaran dan masa inventori di pelbagai stesen dikurangkan. Peta keadaan masa hadapan menggambarkan peningkatan dalam proses sebanyak 87.5% dan peningkatan dalam aktiviti nilai tambah sebanyak 39%, mengakibatkan pengurangan 46.9% dalam masa utama pembuatan.

ABSTRACT

The company must reduce inventories, increase efficiency, and lower manufacturing lead times to maintain consumer satisfaction in the face of increased product competition. Anything that does not add any value to the product and reduces the effectiveness of the process is referred to as "waste." The company will suffer several consequences as a result of waste, including an increase in production costs as a result of the requirement for additional space and handling, the accumulation of work-in-progress piles between workstations as a result of delays, and an increase in the number of redundant operations as a result of overprocessing. This project is a case study of a medical company dealing with long manufacturing lead times and a large amount of work in progress (WIP). The goal of the project is to reduce manufacturing lead time and the number of items in progress, thereby reducing waste on the production floor (WIP). Value Stream Mapping (VSM) will be used to identify waste by distinguishing value-added activities from non-value-added activities in the manufacturing process. The analysis is carried out using the lean tool value stream mapping to improve the medical production line. The current VSM is developed, and wastes are found by examining the existing production line. VSM will most likely execute manufacturing in the future by removing identified wastes. Lead time is reduced by removing waste, and WIP may be reduced as well. As a result, the consumer receives more value at a reduced cost. This finally leads to getting a competitive advantage in an already competitive market. To solve the difficulties, future state maps were constructed using lean techniques and kaizen. Excess inventory is eliminated, and total cycle time and inventory time at various stations are reduced. The future state map illustrates an increase in processes of 87.5% and an increase in value-added activities of 39%, resulting in a 46.9% reduction in manufacturing lead times.

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VSM	Value Stream Mapping
CVSM	Current Value Stream Mapping
FVSM	Future Value Stream Mapping
TT	Takt Time
CT	Cycle Time
MLT	Manufacturing Lead Time
AT	Available Time
WIP	Work in Process
OBC	Operator Balance Chart
WCT	Work Combination Table

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