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Lean Manufacturing Case Study with Kanban System Implementation

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Abstract

Lean manufacturing has been the buzzword in the area of manufacturing for past few years especially in Japan. The Kanban system is one of the manufacturing strategies for lean production with minimal inventory and reduced costs. However, the Kanban system is not being implemented widely by manufacturing companies in Malaysia. Thus, the objectives of this case study are 1) to determine how does the Kanban system works effectively in multinational organization; and 2) to identify factors hindering Malaysian small and medium enterprises (SME) from implementing Kanban. Findings of the study suggest that top management commitment, vendor participation, inventory management and quality improvement are important for Kanban deployment and towards lean manufacturing.

1. Introduction

In general, there are varieties of tools and techniques used in determining effective manufacturing system in a company. Kanban system is just one of the tools and techniques used in lean manufacturing besides other techniques like Quality Circle, 5S Housekeeping, and continuous improvement and many others. Lean is a set of tools that assist in the identification and elimination of waste that might improve quality as well as production time and cost.

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Lean manufacturing is one that meets high throughput or service demands with very little inventory. In lean manufacturing system, Kanban as a tool may control the levels of buffer inventories in the system to regulate production. When a buffer reaches its preset maximum level, the upstream machine is told to stop producing that particular part type.

In order to remain competitive in global competition and to be able to meet unprecedented market changes, organizations must not only design and offer better products and services; but need to improve their manufacturing operations. One of the strategies is by deploying lean manufacturing practices that can be used to improve the operational performances. Lean manufacturing basically refers to manufacturing processes without waste. Waste is anything other than the minimum amount of equipment, materials, parts, and working time, which absolutely are vital to production. Despite the availability of extensive operations management knowledge and resources, many organizations are still struggling to become lean. Hence, organizations need to evaluate and **assess** the current state of operations in their manufacturing facilities. Therefore, one of the key thrust in good manufacturing practices is setting up lean manufacturing with an effective Kanban system.

2. Literature Review

2.1 Lean Manufacturing

Lean means manufacturing without waste. Waste ("muda" in Japanese) has seven types: waste from overproduction, waste of waiting time, transportation waste, inventory waste, processing waste, waste of motion, and waste from product defects. Despite the wide knowledge and available resources, many companies are struggling to stay "lean" (Shahram, 2007). The goals of lean manufacturing are to reduce waste in human effort and inventory, reaching the market on time, and managing manufacturing stocks that are highly responsive to customer demand while producing quality products in the most efficient and economical manner (Bhim et al., 2010). The concept of Lean Thinking (LT) originated from Toyota Production System (TPS) that determined the value of any process by distinguishing value-added activities or steps from non-value-added activities or steps; and eliminating waste so that every step adds value to the process (Antony, 2011). Lean manufacturing focuses on efficiency, aiming to produce products and services at the lowest cost and as fast as possible. For lean manufacturing, Kanban serves as a tool to control the levels of buffer inventories in the production; in simpler terms to regulate production quantities. When a buffer reaches its preset maximum level, the upstream machine is directed to stop producing that part type. Hence, in the manufacturing environment, Kanban are signals used to replenish the inventory of items used repetitively within a facility (Balram, 2003).

2.2 Kanban

Kanban system is one of the tools under lean manufacturing system that can achieve minimum inventory at any one time. Kanban system provides many advantages in managing operations and business in the organization. Using Kanban system is a strategic operational decision to be used in the production lines. It helps to improve the company's productivity and at the same time minimize waste in production. The Kanban system requires production only when the demand of products is available. Manufacturing companies especially in Japan have implemented Kanban system successfully as this system originates from this country. However, it was found that not all companies in Malaysia, particularly, among the small and medium enterprises (SME) in manufacturing sector, are deploying the Kanban system. Even though there are small