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## Fit manufacturing; integrated model of manufacturing strategies

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### Abstract

Manufacturing sector is an essential ingredient to accelerate economic growth of the country. Recent advancements in globalization and technology affect manufacturing systems. By applying manufacturing strategies, manufacturing sector is strategizing to enhance their business performance. Thus the integration of manufacturing strategies is vital to survive in current market competitive environment. In order to gain excellence in manufacturing activities, it is necessary for firms to implement Fit Manufacturing with Lean and Agile systems tend to achieve sustainable benefits. The goal of this paper is to present the main manufacturing strategies and then the Fit Manufacturing as an integration manufacturing strategy consisting Agile Manufacturing, Lean Manufacturing and Sustainability.

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## 1. Introduction

Mostly, manufacturing sector focused on the usage of two broader manufacturing systems which are Agile Manufacturing System and Lean Manufacturing System. However, stakeholders like customers, societies and policy makers consistently pressurizing manufacturing sector to incorporate the social and environmental factor within manufacturing process to protect society and environment from negative effect of the manufacturing process. However, the purpose of these all manufacturing systems is to enhance manufacturing effectiveness through increasing process effectiveness and reducing cost. More so, global competition has necessitated the formulation of both efficient and effective paradigms in response to the global economies for the purpose of improving the overall performance. Lean and Agile Manufacturing have gained wider acceptability in recent years' enterprises. Leanness primarily leads to elimination of the non-value added activities while Agility focuses mainly on leads to market responsiveness [2]. Thus, by applying these strategies manufacturing sector is strategizing to enhance their Business Performance. Thus the integration of these two manufacturing strategies are vital to survive in current market competitive environment.

It is also necessary to note that firms which implement Fit Manufacturing with Lean and Agile systems tend to enjoy sustainable benefits as well as manage to be excellent in all activities [1]. Overall, Fit Manufacturing which is known as a competitive paradigm empowers manufacturing organizations to support universal competitiveness. On top of that, it also acts as a necessary ingredient in all-round among firms in the manufacturing sector in Malaysia. According to Pham and Thomas [4], Fit Manufacturing framework assists manufacturing firms in becoming economically sustainable, and meeting global market competition. However, there is minimum effort made for analyzing the implementation of Fit Manufacturing in their business operations, thus it is crucial to conduct this research in order to improve manufacturers' business performance.

## 2. Lean Manufacturing (Leanness)

According to Naylor et al. [5] "Leanness means developing a value stream to eliminate all waste, including time and to ensure a level schedule". Sharma [6] revealed that Lean Manufacturing is considered as a requirement for manufacturing systems that has been conceptualized by Toyota. According to Kumar, Kumar [7], the Lean Manufacturing System is classified as a strategy while Sundar, Balaji [8] posit that Lean Manufacturing is a waste reduction method. Likewise, El-Tawy and Gallear [9] revealed that Leanness is essentially concerned with reducing waste, as Leanness exists to improve information on participation and encourage the standardization of work and continuous improvement.

Lean concept, focuses on elimination of non-value-added activities. The challenges of effective competition in the business environment has made lean crucial capability of a manufacturing organization which is able to achieve strategic objectives such as productivity, profitability and survival via improvement in the overall performance [2].

## 3. Agile Manufacturing (Agility)

Agile Manufacturing is intended to enhance the competitiveness of firms. Manufacturing processes based on Agile Manufacturing are characterized by customer supplier integrated process, involving product design, manufacturing, marketing and support services [10].

According to Sherehiy [11], Agility is regarded as a new model which utilizes both management and production. Dubey and Gunasekaran [12] demonstrate that Agile Manufacturing is considered as an operational strategy that organizations have utilized to reduce environmental risks, resulting in a global economic slowdown. Gunasekaran [13] notes that Agile Manufacturing is considered similar to sustainability due to its development in a competitive environment, variable modification and quick, efficient response in developing markets. Agility was depicted as "the ability to timely and cost-efficiently design and produce goods of customer-driven quality, in order to deliver them within a window of commercial opportunity, coping with volume uncertainty" [14].

Furthermore, Agility refers to the successful exploration of competitiveness based on speed, flexibility, innovation proactivity, quality and portability via the integration of both recognizable resources and best practices in

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