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MANUFACTURING EXCELLENCE APPROACH TO BUSINESS PERFORMANCE MODEL

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ABSTRACT

Six Sigma, lean manufacturing, total quality management, quality control, and quality function deployment are mental set of tools to enhance productivity in organizations. There is some research that outlines the benefit of each tool into a particular context of firm´s productivity, but not into broader context of firm´s competitiveness that is achieved thru business performance. The aim of this theoretical research paper is to contribute to this mean and propose nufacturing excellence approach that links productivity tools into a broader context of business performance.

JEL CLASSIFICATION & KEYWORDS

■ M11 ■ L15 ■ L23 ■ BUSINESS PERFORMANCE ■ MANUFACTURING EXCELLENCE ■ TOTAL QUALITY MANAGEMENT ■ VOICE OF THE CUSTOMER ■ LEAN SIGMA

INTRODUCTION

Business performance and competitive advantage are two related concepts that requires the implementation of different methodologies that enhances manufacturing productivity and profitability; These methodologies are taken into a broader scope of operational strategy that seeks for continuous improvement in order to achieve gross profit. Firms are facing different challenges such as globalization, economies of scale, innovation, green markets, supply chain sustainability, in which low-cost manufacturing, differentiation and aiming to specific target needs are essential to succeed.

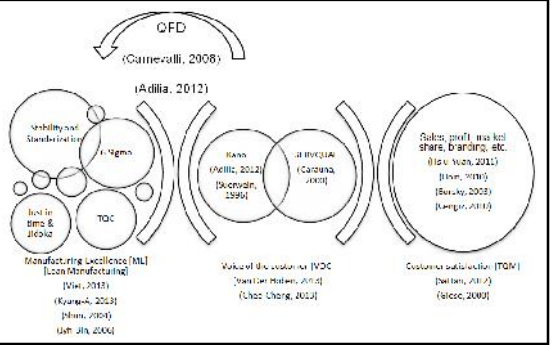
Productivity and continuous improvement theories outlines two fundamental methodologies: Quality improvement programs and lean production methods (Mefford, 2009). There are several unknowns in regards of configuring the right approach to enhance productivity, which are the correct tools that could increase operating profit and gross margin? Should such mechanisms be implemented in an isolated way or systemic approach? According to Salleh, Kasolang, & Jaffar (2012) improvement methodologies could be integrated into a manufacturing execution model that leads to perfection.

This systematic approach can be profiled to configure a business performance model that integrates the voice of the customer and manufacturing excellence to provide consistent and repeatability goods and services to end customers.

Theoretical background

Andersson, Hilletofth, Manfredsson, & Hilmola (2014) argues that lean manufacturing and six sigma are complimentary tools to reduce process variability and lead time, Cruz (2012) propose that firm´s needs are not only based on understanding the voice of the customer, on the contrary it requires a strategy to achieve those needs consistently (Figure 1).

Figure 1: Business performance model



Source: Adapted from the original version cited in (Cruz Álvarez, López, & Perry, 2014)

In this competitive era quality improvement and lean production programs are taken as a survival strategy Lee-Mortimer (2006) that can energize firms to look for productivity.

Manufacturing excellence strategy takes into consideration key methods that are integrated with a systematic approach to establishing the foundation of productivity. These tools are not isolated, need to be part of the operational strategy for improvement where top management´s leadership and change management are enablers for this holistic approach. The following table explores the quantity of research papers contributing to the quality and lean production programs (see Table 1).

Manufacturing excellence methodologies

- 6 sigma [6s]: Practitioners and researchers´s perception of Six – sigma, is that Six-sigma methodology is focused on understanding process variation, sources of variability, meanwhile leads the team focus to address sources of variation drastically in order to improve manufacturing process robustness. Six-Sigma is not only relying on statistics to address variation process, on the contrary, it is a well-structured approach to face variation to improve process repeatability and reproducibility.
- Jidoka: In manufacturing environments it is essential to face any process variation upfront rather than dealing with unstable process; One key element that contributes to this awareness level is the human factor. People can alert the system immediately in combination with error proofing devices and training and certification. Jidoka is not only related to the concept of early detect – early prevent, it is related to a more robust process based on high level of quality awareness, fail-safe devices and quality culture, in which, every opportunity to address quality issues is surfaced to management and addressed.
- Just in time [JIT]: Highly repetitive manufacturing environments are suitable for just-in-time methodology's,

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Table 1: Empirical research on steel industry competitiveness

Keyword	Reference
6 Sigma	(Schroeder, Linderman, Liedtke, & Choo, 2008)
	(Gremyr & Fouquet, 2012)
	(Jacobs, Swink, & Linderman, 2015)
Jidoka	(Lee Mortimer, 2006)
	(Jongyoon, K., Gershim, 2005)
	(Motwani, 2003)
	(Haefner, Kraemer, Stauss, & Lanza, 2014)
Just in time	(Battaïa & Dolgui, 2013)
	(Mohan, M., Ganesan, K., Suresh, 2013)
	(Becker & Scholl, 2006)
	(Colledani et al., 2014)
	(Das, Venkatadri, & Pandey, 2013)
Stability and Standardization	(Motwani, 2003)
	(Monge, Cruz, & López, 2013)
Total Quality Control [TQC]	(Yunis, Jung, & Chen, 2013)
Manufacturing excellence	(Álvarez, Calvo, Peña, & Domingo, 2008)
	(Álvarez et al., 2008)
	(Anvari, Ismail, & Hojjati, 2011)

Source: Literature review using SCOPUS, Google Scholar, DOAJ databases within a six-year time frame

on the contrary, more complex systems would require some modification to its fundamental tools to reduce manufacturing cycle time, lead time, in order to maximize throughput.

- Stability and Standardization: There are four essential elements of stability and standardization known as 4M´s: manpower, machines, materials, and methods. Stability and standardization are essential elements to process monitoring and controlling.
- Total Quality Control [TQC]: It is the ability to based consistently on preventive statistical control methods and people engagement that leads to creating the environment to achieve quality in all stages of the manufacturing process.
- Manufacturing Excellence: It is a set of core elements to enhancing productivity including blending approaches of lean manufacturing and six sigma methodologies. Manufacturing excellence integrates methodologies like jidoka, jut in time, six sigma, stability and standardization and total quality control in order to achieve perfection in manufacturing execution.

CONCLUSION

Manufacturing excellence is a broader concept that leads to seeking perfection in manufacturing execution, integrating blending approaches of Lean-sigma to reduce process variability while increasing throughput flow. Manufacturing Excellence in combination with voice of the customer is the foundation of business performance. Business performance model and its mains two elements (manufacturing excellence and voice of the customer) might be taken as part of firm's operational strategy to increase gross profit; it provides a structured, proven set of tools that leads to improving performance.

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