ISSN:1991-8178

Australian Journal of Basic and Applied Sciences

Journal home page: www.ajbasweb.com

Lean Manufacturing Implementation and Sustenance in Malaysian Manufacturing Industry: Challenges and Issues

[1]Wai Seng Foo, [2]Eng Lim Ang, [3]Dr. Bhuvenesh Rajamony and [4]Dr. Chang Chuan Lee

[1,2]Phd Candidate, Universiti Malaysia Perlis, School of Manufacturing, 01000 Kangar, Malaysia
[3]Prof, Universiti Malaysia Perlis, School of Manufacturing, 01000 Kangar, Malaysia
[4]Dr. Universiti Malaysia Perlis, School of Manufacturing, 01000 Kangar, Malaysia

ARTICLE INFO

Article history:
Received 22 February 2015
Accepted 20 March 2015
Available online 25 April 2015

Keywords:
Lean manufacturing, Malaysian industry, implementation, sustenance, challenge

ABSTRACT

One of the main issues with the different industries today is to manufacture products that help in elimination cost as well as works towards waste reduction. These and many other industries related problems had led to the formation of lean manufacturing, a method that was initially implemented by Toyota of Japan. However, there is very little, almost no research that is done on lean manufacturing in Malaysia and there is a lot of struggle that Malaysian manufacturing industry is facing in the implementation and sustenance of lean principles as well as policies. The present project research is an attempt to find the challenges or issues that Malaysian industries are facing in order to implement and successfully sustain the lean manufacturing processes. The researcher would try to investigate on the topic by taking mixed analysis method, where both primary and secondary researches would be conducted. This research would also take in the different principles and concepts in lean manufacturing and collate it with the primary findings. Overall, this study can be used as a benchmarking for successful lean manufacturing implementation in other developing countries.

To Cite This Article: Wai Seng Foo, Eng Lim Ang, Dr. Bhuvenesh Rajamony and Dr. Chang Chuan Lee., Lean Manufacturing Implementation and Sustenance in Malaysian Manufacturing Industry: Challenges and Issues. ***Aust. J. Basic & Appl. Sci.,*** *9(12): 1-6, 2015*

INTRODUCTION

Lean manufacturing is a vast amount of principles that mainly focuses upon the reduction of cost by the elimination of activities that are non-value added. This concept helps the companies to stat continuously competitive in an industry (Curtis and Wroclawski, 2009). There are various different research studies and literatures that are trying to discuss on the methods of lean manufacturing implementation and its challenges as well as benefits to different types of industries. The topic has also caught the high attention of managers and researchers to improve lean manufacturing. However, very few amount of research is done in relation with lean manufacturing in Malaysia, which results in a lot of struggle for those lean companies in Malaysia who implemented the lean methodology into their operational processes (Watson, 2014).

The recent developments by the industries in trying to have a controlled manufacture of goods and devices, comes from the wake of the continuous demand of providing high quality material that runs well and takes measures to check environmental pollution. The fact that a large bulk of production of the vehicles Toyota was manufacturing, more than what was demanded by a single client or group of clients, had led to huge amount of overhead expenditure (Singh *et al.* 2010). Moreover, these vehicles were also not finding compatibility in the market after certain period in time as they were left unused for years at a stretch. To successfully manage these debts and to avoid wasting of raw materials had resulted in the conceptualization of this concept of lean manufacturing, which tried to optimize the production of products according to the required demand (Rachid, 2011). By studying the concept and requirements that the manufacturing and other industrial purposes of any product, one can optimize the on the wastage of raw material and also the manufactured product. Hence, it can be said that, the concept of lean manufacturing helps of the effective use of the resources that helps in the proper as well as adequate use of these resources thereby utilizing the work force adequately but not allowing employees sit idle and loose upon the precious time of efficient and competitive edge and thereby lose revenue earning for the company (Peter *et al.* 2011).

Corresponding Author: Wai Seng Foo, Universiti Malaysia Perlis, School of Manufacturing, 01000 Kangar, Malaysia.
Tel: 60165535053; E-mail: foowaiseng@gmail.com

Lean Manufacturing has gained quite a lot of importance in the sector of industrial management as this phenomenon can reduce a lot of waste in production and manufacturing and have help in useful production of industry equipment and devices (Nordin *et al.* 2010). The concept was stated in Japan by Toyota Motors for the first time, to reduce excessive production of vehicles and its machine parts which becomes a junk material in its gradual time of remaining unused due to the production in excess than required. The necessity for lean manufacturing is one weapon to achieve competitive success by effectively utilizing the resources and producing only the amount that is required or has been demanded by the client (Meyers and Stewart, 2002).

In spite of all the talks about lean manufacturing, it remains obvious that most of manufacturers in Malaysia are yet to understand the full benefits this terminology provides. Particularly, the focus of various plants assembling and manufacturing machineries that is mostly dominated by the capital equipment as well as the areas related to automation, have tried in remaining fixed in OEE, on-time delivery and high quality. These factors have continued in being driven by outdated and an in-trenched mentality of batch and queue (Lee-Mortimer, 2006).

Problem Statements:

Lean manufacturing is a management philosophy derived from Japanese production system practice such as Just-In-Time manufacturing or mostly known as Toyota Production System, TPS. A lean practice is targeting to eliminate any expenditure of resources for achieving any goals that without value creation for the end customer. After the worldwide oil crises in the early of 1990's, there was an intense interest on lean manufacturing implementation among the western automotive manufacturers as what was summarized in the published book under the name of The Machine that Changed the World (Womack *et al*., 1990). Concept of lean manufacturing was spread across the countries and industries due to fierce challenges such as rising customers' expectation, fluctuating demand, and competition in the globalized markets. There is no excluded for manufacturers in the electronics and semiconductors industry.

Despite the huge advantages gained from successful lean manufacturing implementation as well as many researchers and practitioners have studied on lean philosophy and its implications, but there is little studies regarding on lean manufacturing implementation have been done at electronics and semiconductors industry in Malaysia. Thus, this research study is to narrow down the observed gap in lean manufacturing implementation in Malaysian industries by analyzing the principles as well as challenges experienced by studied industry's players, hence it helps the rest of Malaysian organizations to get better understanding the current lean manufacturing development and preparation for their better decision on lean manufacturing implementation challenges in the near future.

Literature Review: Introduction:

In presenting the theoretical framework that is required to perform the study, literature review is used. The presentation of an overview of current literature is presented on lean manufacturing as well as technology (Nordin *et al.* 2010). The relationship between the principles of lean manufacturing integrated with the technology, with its impact on the performance of an organization is studied and introduced. One can observe the increase in the organizational performance in the total progress that is happening in information technology and manufacturing. Following this, the lean manufacturing elements show in a traditional sense show different aspects of improved quality and reducing wastes, better cost, as well as response time that would include the using of problem solving and planning just-in-time(Curtis and Wroclawski, 2009).

This chapter explores into the usage of technology in planning, procuring as well as execution phases that are involved in any manufacturing process. The concepts of lean manufacturing, the principles in lean manufacturing, the techniques used in the implementation of lean manufacturing by the Malaysian industries and challenges that the industries in Malaysia faces in successful implementation of lean manufacturing technology has been studied (Watson, 2014).

Concepts of lean manufacturing:

Lean is one strategy of operational excellence that enables an organization to change for improvement and betterment. The Japanese often use the concept of "Kaizen" which gets used by the lean practitioners so that they can describe improvements occurring incrementally (Singh *et al.* 2010). In other words, it is the persisting process of the eliminating waste, however, does not add any real value to the service or product. The advantage of this manufacturing process is that it shows respect for people and is a stable process of high quality. The lean manufacturing concept can be used is all the levels where there remains a strong desire of showing better performance. In this system, the key focus is to understand the customer and deliver service or goods according to his requirements. This culture has visible priority as well as practice from the top-bottom arena of the workers (Rachid, 2011).

Lean manufacturing helps in improving business performance by using simple tools as well as techniques so that the quality, delivery, people's contribution and cost is enhanced, by exposing the waste that is happening in a system(Peter *et al.* 2011). Here the people are made to change the ides and work practices they have had standing long with them. It is very important that the senior management drives the principles of lean manufacturing forward with absolute commitment towards its success. It is, however, not a bolt on technique but more a way of life that leads to a total cultural change (Nordin *et al.* 2010).

Principles of Lean Manufacturing:

The lean manufacturing runs with certain basic principles like:

- Identifying the customer
- Mapping the flow

- Making a service or a product flow
- Create customer demand based polls
- Find ways of continuous improvement

However, there are several more principles of lean manufacturing which need to be understood so that lean can be implemented. Failing to understand as well as apply the principles would probably lead to failing in lack of commitment from all the members in the organization. Lacking in commitment indicates the ineffectiveness of the process (Meyers and Stewart, 2002).

Challenges for the Lean Industry:

There are several challenges that the lean industry seems to face these days in Malaysia. The researcher in the following section is going to jot down different impediments that are being faced by the companies in these days.

Threat of Vendors:

In the lean industry the vendors has to play two kinds of role: on one hand, supply the raw materials to the companies such as plastic beings and on the other, shipping the final products to the market place. Therefore, the industries are needed to have proper vendors and supplier. Rather as the organizations are needed to purchase different raw materials, often from outside of the country as well, it becomes costlier to handle. Peter *et al.* (2011) have mentioned that the role of the vendors is really significant for the development of the lean industry. But it is often seen that the vendors are not performing their duty properly, rather fronting their back towards the company. Often it is also seen that vendors alienate themselves from the development of the organization which stands to be the biggest challenge for the companies. It is seen that application of Just in Time (JIT), Pull and Kanban systems are the most beneficial for the development of lean industry. But in applying these techniques the companies need not to maintain large inventories. In Malaysia, as most of the raw materials for the industries need to be imported from abroad, storing of the products becomes necessary which is really a big challenge to the business runner.

Unavailability of Proficient Employees:

Skill-set and knowledge know-how competency in lean manufacturing within organization's community is playing another vital role for a company successfully on lean principles execution. In the study, it is seen that for the lean industries availability of the expert and proficient employees is very much rare. This is because of lacking of learning institution and none of any local universities of Malaysia are conducting any course which may yield proficient human resource in lean profession. Even in the graduation schools there are no specification courses on lean industry which is making the problem more complicated in nature. Rather there are barely any training institutes in Malaysia that trains the students and make them aware about the different factors of lean industry. This actually is letting the companies to have difficulties looking out for the proficient lean principles practitioner who have expertise on the lean principles and application of tools such as Kaizen, JIT, Pull System, 5S and passionate to actively coach the rest of employees to participate in lean deployment. Therefore, lack of proficient employees is one of the most sophisticated challenges for the companies to apply lean principles.

Uncertainty of Demand of the Market:

Peter *et al.* (2011) have mentioned that the demand of the products in the market place manufactured through the application of lean principles is not stable always. Often it seems that the pile of stocks is more than the market demand which let the companies to incur a huge loss, revert is also practical. Key challenge is because of the market for majority of Malaysian manufacturing industry is very much oriented to domestic demand. For this uncertain market, no proper development can be possible for these industries. If the demand of market stands unequal with the supply of the products, the price of the product increases which cast a diverse effect on the development of the company. Therefore, lack of stability of the Malaysian market place because of very much dependent on the macro-economic environment, lean strategy is not often successful. It will be lowering the impact of challenge if the product marketing place can be spread out across various regions throughout the world to meet economic of scale.

Lack of Proper Standardization:

Standardization is another sophistically necessity to attend the success in application of lean principles. Therefore, providing proper training to the staffs, proper manipulation, performance appraisal are the most essential factors (Meyers and Stewart, 2002). But the lean manufacturing industries of Malaysia, in most of the cases, do not seem to be so many enthusiasts in this fact.

Stick to Conventional Approach:

The semiconductor, electronics, manufacturing, construction and other industries of Malaysia for a long time had been nurturing the conventional strategies of development. To change those conventionality, all on a sudden, is a fish out of water. Therefore, though having been more advantageous, the companies avoid reverting and accepting the lean principles. Curtis and Wroclawski (2009) have mentioned that when the continental and sub-continental countries are changing their long standing principles in the industrial sector and being fascinated by the lean principles, Malaysian companies are lagging behind. Management team of companies in Malaysia mostly have participants from family members, family oriented members are usually tending to run their business decision based on their past experience. With this, it created a situation at which, the bottom of company organization encouraged to pursue for lean principles, while at the top management level are trending back to their conventional principles whenever came to business decision making. Curtis and Wroclawski (2009) seem to have accused the company leaders who are the mainly responsible for not applying the lean strategies in their organizations.

Methodology:

This chapter deals with the science of studying various techniques through which research can be performed scientifically (Hakim, 2007). The researcher is attempting to provide the research approach, design, philosophy, techniques, paradigm and tools with proper justification. According to required conditions in the given study, the research will consider the positivism philosophy of research, along with a deductive approach in research, and a research design that is descriptive (Gulati, 2009). For the data collection method, both primary as well as secondary sources and was analyzed to understand the principle of lean manufacturing and its successful implementation in the Malaysian industries. The proper maintenance of research validity, ethics as well as reliability is done while the responses have been collected on the sample that is chosen. Using the research onion proposed by Saunders *et al.* (2009) helps in easy understanding what the entire process of research methodology should be is derived. Each layer in this research onion is denoting the steps that get used in conducting the steps of the study.

Research Philosophy and Approach:

According to Cameron (2009), research philosophy deals with the searching of knowledge applicable in the research. This research conducted through the positivist philosophy where the researcher collected the facts and then studied the relationship of one set of factors with that of another, and phenomenology i.e., the role of lean manufacturing in the successful implementation in Malaysian industries (Haffar *et al.* 2013). The researcher opted for positivism as it provides opportunity to collect facts from different respondents as well as other types of secondary data to come to a final derivation of conclusion that helped in finding conclusion regarding the need of lean manufacturing in the successful implementa tion and sustainability in Malaysian manufacturing industry. The approach of positivism happens to be more scientific in nature. Of course, there are limitations in positivism as well, like it stops the scope of assumptions and imaginations that limits the findings in the study (VanderStoep and Johnson, 2009).

Out of the two types of approaches, deductive and inductive, it was the deductive approach that moved towards the specific from general and was predominantly a top-down approach. There was a logical follow up of conclusions from the facts available. Of course, there were certain degrees of uncertainty as well as conclusions that get followed in deductive observations (Hesse-Biber, 2010). As there were no new theories being evaluated in this study, but only judgment of the existing theories within the context of present conditions were happening, deductive approach seems more suitable. The researcher in this study scrutinized the existing literatures and analyzing them critically. There was also collection of primary data that helped the researcher in comparing with the validity of these theories. The conclusion of this study was drawn on the basis of the found comparisons and their evaluations. As the research involved quantitative analysis, there were some of the factors that were beyond researcher's control (Cameron, 2009).

Research Design:

Based on the knowledge of the aims and objectives of the research by the researcher, the research design selection has been done. Among the three types of designs in research in conducting a social or an academic research, exploratory, explanatory, and descriptive, here the researcher has used the descriptive design. Explanatory and exploratory design of research was used when the research is not developing a formal objective sets or questions and also when the researcher is not having enough knowledge of the topics of research (Crowther and Lancaster, 2012). Descriptive design is, on the other side, used in case of a constructive research which has a set of questions and objectives. This design was used in evaluating answers to those questions which involved, how, what, when, who and where of the topic of study. Since it is a formal analysis, which covers a set of aims and objectives that require being evaluated, descriptive design helps in the research as it suitable for those studies that are formal and structured, providing a scope of in-depth analysis such that the researcher was able to gather valid and reliable information for successful conducting of the research (Bryman, 2008). Due to time constraint in conducting the study, the research was done by cross-sectional survey.

This study has the researcher using both types of collection of data, primary as well as secondary to evaluate the research objectives as well as questions (Leavy and Hesse-Biber, 2010). A set of questionnaire survey form distributed to various manufacturing firms owned by Malaysian. The nature of the interview questions were semi structured, open ended and probe the managers regarding the applicability of lean techniques in the manufacturing process, from multiple dimensions. Primary data will be collected by combining quantitative and qualitative data collection, i.e. by using a mixed approach. The analysis of the information will be done thematically by comparing the response given by the managers during the interview. Transcripts were prepared during the conversation to be referred to while presenting the findings. The findings aligned with the literature review and the research problems identified in this study.

Conclusion:

This study attempt to gain a better insight of the dimensions that determined factors and challenges influence the successfulness of lean manufacturing implementation in Malaysian manufacturing industry based on the previous study consolidated and data collection throughout the period of present study. Thus, understanding and gathering more information on these challenges directed researchers to investigate further the relevant issues pertaining to lean manufacturing implementation in Malaysian high volume production industry. On top of that, it also provides a lead way for any industry player wishing to deploy lean manufacturing as future route to manufacturing survival as well as to serve as the

reference guide for adoption and diffusion research topic for researchers in other universities.

REFERENCES:

Bryman, A., 2008. "Integrating quantitative and qualitative research: how is it done?" *Qualitative Research*, 6(1): 97-113.

Cameron, R., 2009. 'A sequential mixed model research design: design, analytical and display issues', *International Journal of Multiple Research Approaches*, 3(2): 140-152.

Curtis, T. and R. Wroclawski, 2009. Achieving High Performance in Lean Times Leveraging "Next-generation Lean Six Sigma" to drive immediate business impact. *Accenture*.

Ellis, T. and Y. Levy, 2009. 'Towards a guide for novice researchers on research methodology: Review and proposed methods', Issues in Informing Science and Information Technology, 6: 323-337.

Haffar, M., W. Al-Karaghouli and A. Ghoneim, 2013. An analysis of the influence of organizational culture on TQM implementation in an era of global marketing: the case of Syrian manufacturing organizations. *International Journal of Productivity and Quality Management*, 11(1): 96-115.

Lee-Mortimer, A., 2006. A lean route to manufacturing survival. *Assembly Automation*, 26(4): 265-272.

Nordin, N., B. Deros and D. Wahab, 2010. A survey on lean manufacturing implementation in Malaysian automotive industry. *International Journal of Innovation, Management and Technology*, 1(4): 374--380.

Peter, G., K. Shinn and F. Fleener, 2011. Lean manufacturing practices: Issues created when two companies are integrated and quality management standards are imposed, 1-7.

Rachid, A., 2011. The implementation of lean production and quality methods at the shop floor: case studies in the household appliances industry. *Federal University of São Carlos*.

Singh, B., S. Garg and S. Sharma, 2010. Scope for lean implementation: a survey of 127 Indian industries. *International Journal of Rapid Manufacturing*, 1(3): 323-333.

Toloie-Eshlaghy, A., S. Chitsaz, L. Karimian and R. Charkhchi, 2011. A Classification of Qualitative Research Methods, Research Journal of International Studies, 20: 106-152.

Watson, J., 2014. Integrating Lean Manufacturing With Technology: Analyzing The Effects on Organizational Performance in Terms of Quality, Cost, and Response Time. *Dissertation*.

Krafcik, F., John, 1988. Triumph of the lean production system. Sloan Management Review.

Brodner, P., 1986. Skill-based manufacturing versus unmanned factory- which is superior. International Journal of Industrial Ergonomics, 1: 145-53.

Brodner, P., 1990. The Shape of Future Technology. Springer-Verlag, Berlin. Drury, C.G., 1997. Quality movement. Ergonomics, 40(3): 249-64.

Eklund, J., 1997. Quality and continuous improvement- conceptual and empirical relationships in an industrial context. Ergonomics, 40(10): 982-1001.

O'Brien, C., 1991. Perspectives on current production research. Taylor & Francis, London.

O'Brien, C., 1991. Production Research: Approaching the 21st Century. Taylor & Francis, London, 3-8.

Mital, A., 1991. Manual versus flexible assembly: a cross comparison of performance and cost in four different countries. Taylor & Francis, London, 481-8.

Mital, A., 1992. Economics of flexible assembly automation: influence of production and market factors. Chapman & Hall, London, 45-72.

Mital, A. and L.J. George, 1989. Economic feasibility of a product line assembly: a case study. The Engineering Economist, 35: 25-38.

Eida, N. and Shamsuddin, 2014. A conceptual model for full-blown implementation of lean manufacturing system in Malaysian automotive industry. International Conference of Industrial Engineering and Operation Management, 1309-1315.

Bhim Singh and S.K. Grag, 2010. Scope for lean implementation: a survey of 127 Indian industries. International Journal Rapid Manufacturing, 1: 323-332.

Rusli, M. and Mohd. Ali, 2014. Implementation of lean manufacturing through supplier Kaizen framework- A case study, 2221-2228.

Pettersen, J., 2009. Defining lean production: some conceptual and practical issues, 21: 127-142.

Wong, Y.C. and K.Y. Wong, 2009. A study on lean manufacturing implementation in the Malaysian electrical and electronics industry. European Journal of Scientific Research, 38: 521-535.

Meyers, F. and Stewart J., 2002. *Motion and time study for lean manufacturing*. 1st ed. Upper Saddle River, N.J.: Prentice Hall.

Crowther, D. and G. Lancaster, 2012. Research Methods, 2nd ed. London: Routledge.

Denzin, N.K. and Y.S. Lincoln, 2011. The SAGE Handbook of Qualitative Research. Page 271, 4th ed. London: Sage Publications.

Gulati, P.M., 2009. Research Management: Fundamental & Applied Research, Page 45, Global India Publications Pvt. Ltd.

Hakim, C., 2007. Research design: successful designs for social and economic research. 5th ed. London: Routledge.

Hesse-Biber, S.N., 2010. Mixed Methods Research: Merging Theory With Practice, 3 ed. New York: Guilford Publications.

Leavy, P. and S.N. Hesse-Biber, 2010. The Practice of Qualitative Research. Page 253, 2nd ed. London: Sage Publications.

Saunders, M.N., P. Lewis and A. Thornhill, 2009. Research methods for business students, Page, 52. 5th ed. Harlow: Prentice Hall.

Sekaran, U. and R. Bougie, 2010. Research Methods for Business: A Skill Building Approach, 5th ed. New York: Wiley Publications.

Vander Stoep, S.W. and D.D. Johnson, 2009. Research Methods for Everyday Life: Blending

Qualitative and Approaches. 4th ed. San Francisco: Jossey-Bass.