

Implementation Issues of Advanced Manufacturing Technology: A Case Study

A

MAJOR PROJECT REPORT

for the award of

Masters Degree in

Production Engineering

Submitted By:

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CERTIFICATE

This is to certify that the project report entitled “Implementation Issues of Advanced Manufacturing Technology: A Case Study” being submitted by Ms. Paramjeet Kaur to Delhi University for the award of Masters Degree in Production Engineering is a bonafide project work carried out by her under my supervision and guidance.

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Professor and Associate Head
Department of Mechanical Engineering
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TO WHOMSOEVER IT MAY CONCERN

This is to certify that Ms. Paramjeet Kaur has carried out her ME Project on “Justification of Advanced Manufacturing Technology using Analytical Hierarchy Process” in Maruti Suzuki in the month of January 2011.


(S.G. MANI)

GEN. MANAGER

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GURGAON.

MARUTI SUZUKI INDIA LIMITED

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EXECUTIVE SUMMARY

In today's competitive environment, companies are required to meet the market demands both efficiently and effectively. In such a case, it becomes essential to turn to the advanced manufacturing and computer-aided technologies that can respond adequately to present competition and market pressures. Several technologies such as computer numerical control (CNC) machine tools, computer aided design (CAD), Computer Integrated Manufacturing (CIM), and Co-ordinate Measuring Machine (CMM) involve the use of computers to control tools and machines, store product information, and control the manufacturing process. Besides these, there are various other technologies or programs in which there is no direct involvement of computers, but they are also considered to be AMTs as they are closely associated with other AMT technologies.

AMT offers several benefits as compared to a conventional set-up. In today's competitive scenario, one cannot overlook the benefits derived from these technologies such as: better product/services performance, increased flexibility to produce new design changes, more savings, etc. However, which advanced technology is best suited for which purpose, it needs to be carefully analysed beforehand. One technology cannot cater to all the aspects that are desired for making a production system effective and efficient.

This project aims at first identifying the existing advanced manufacturing technologies and classifying them in a hierarchical manner under the three categories as: (a) AMT at Elemental level (b) AMT at Shop-Floor level (c) AMT at Factory/Enterprise level. In order to analyse the justification of a particular technology for fulfilling a specific purpose, it is essential to identify the crucial parameters of performance and application of advanced technologies in an industry. Hence, a database was prepared for the existing AMTs and their varied applications. Thereafter, the connection between the two was established. In this case, referring to a particular industry set-up, the relationship between the technology and its application is done for Maruti Suzuki, wherein the technology is rated as least connected, moderately connected, and strongly connected to the various parameters of performance and application. Furthermore, to quantify the results an

appropriate tool needs to be selected. In this context, Analytical Hierarchy Process (AHP) is used for quantifying the data collected from Maruti Suzuki Ltd. With the help of this tool, it is found which technology is best for which application. Hence, with this approach, an industry can make prudent decisions while introducing any technology so that maximum benefit can be derived.

The thesis comprises of five chapters. After the first chapter on introduction, chapter 2 gives a detailed literature review carried out in this field. Chapter 3 focuses on identification and classification of AMT in Maruti Suzuki. At the end of this chapter, a table giving relationship between the AMT and its objective is prepared. To quantify the results, AHP is applied on this table in various stages in chapter 4. This chapter gives the relationship between AMT and its application numerically as well as graphically, in terms of its weighted score and bar graph. Chapter 5 gives the results and conclusions as derived from the above analysis.

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(Paramjeet Kaur)

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