

Aspects of Advanced Manufacturing Technologies: The Review

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Abstract

The advanced manufacturing systems help to improve the production processes and various management techniques. Advanced manufacturing technology (AMT) involves the innovative integration and optimization of new technology. This helps to increase the productivity and flexibility. In this research paper several factors have been studied from the literature review.

Keywords: advanced, manufacturing, factors, production

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INTRODUCTION

The system of advanced manufacturing production had the capability of furnishing a mixture of products such as small, medium and large quantities with both the efficiency of productivity and flexibility of custom manufacturing to respond quickly to customer demand.^[1] The importance of flexibility and efficiency has increased in the manufacturing fields. The rising levels of uncertainty in consumer preferences have caused aggressively search for cost reductions and other sources of competitive advantage in many organizations.^[2] In developing and developed countries, the small and medium scale industries are the backbone of the industrialization process. They play a crucial role in increasing the country's economy. With a big global change and free trade agreements, the SMI is under the pressure to implement advanced manufacturing technologies for performing the competition or simply to survive. From the literature review, it has found that advanced manufacturing technology (AMT) can be implemented in small scale firms and are more successful than larger firms. The

implementation of AMT required the SMIs to implement new ways of thought and work process. A successful and developed implementation of AMT will be required the companies and organizations to have a workforce with high level of skills, flexible structure of organizational and new culture in management and training.^[3]

LITERATURE REVIEW

In Park et al. (1990), the implementations of automation technologies entail a large initial investment under a long-term and uncertain environment. Decisions for the implementation of AMT must be determined by expectations concerning factors of demand, like the breadth of the variety of products, the quantity of demand, and also the quality of products, have also been observed.

Mohanty's (1993) study stated that the successful selections and implementations of AMT require an understanding of various issues. Researchers have found and identified the classifications of these attributes. For example, Tayyari and Kroll (1990) have divided the AMT issues into two

categories, they are (i) direct cost benefits and (ii) intangible (hidden) benefits.

Mohanty (1993) has identified and classified the implementation issues into six categories: (1) direct cost factors, (2) preproduction cost factors, (3) human issues, (4) social issues, (5) strategic issues, (6) and technological issues. He argued that the implementation problems are classified primarily based on the accountability for analyzing AMT benefits. Economic or tangible factors are quantifiable using cost-borne figures.

The factors are further classified into three categories, such as preproduction cost factors, direct production cost factors, and indirect production cost figures.

The implementation problems have long-term implications for the organization as a whole; and so, it is important to consider the effects of AMT on the organization.

FACTORS AFFECTING THE ADVANCED MANUFACTURING SYSTEMS

The key factors that affect the advanced manufacturing systems are given below:
[5]

1. Human factors
2. Strategic factors
3. Technological factors

Human Factor

The factors are involved with turnover of team members, education level and background, active participation from the in-house engineers in system design, level of workers and their efficiency, need for team formation, safety of performing job, education level of workers, existence of an employee education & training program prior to implementation, employee relation &

cooperation, degree of availability of education and training program, organization and composition of the team, need for team members to be familiar with the new technology, and employee motivation.

Technological Factors

Between the technological category factors, we have identified and classified the degree in which the organization had experience with a pilot project before the implementation, configuration of software, configuration of hardware, compatibility of the technology with existing system, convenience in using the technology, understanding the potential contribution of AMT to current operations and what new technologies can achieve, and degree of availability of skill.^[4]

Strategic factors

The requirement to revise the policies and procedures, requirement to restructure the organizational structure, nature of the relationship between degree of top down-planning and bottom-up implementation, existence of a project leader, degree of willingness of top management to take short-term risks for long-term improvements, technology supplier and the user firm, position of the project leader in the organization, and degree of financial support comes in the category of strategic factors.^[1]

CONCLUSION

Developed and advanced systems in the manufacturing organization are liable to achieve the goal of product and fulfill the demand according to global market situations. From the literature review, it has also studied that hardware and software can be reconfigured in some of advanced manufacturing systems. In this paper the factors affecting the advanced manufacturing systems are studied.

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