

STUDY OF BARRIERS AND ENABLERS IN IMPLEMENTATION OF FLEXIBLE MANUFACTURING SYSTEM

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Today, the market scenario is becoming more dynamic and more customers driven. Many consumers want more kinds of products according to their desires. They also want to be distinguished from others. This new trend leads the industrial manufacturing systems to produce a large diversity of products in small quantities. In addition to customers' demands, with advances in computer and electronic technologies making automation an integral part of manufacturing systems, the recent technological trend is towards developing such type of production technology, which can provide both flexibility and speed in the manufacturing system. Flexible manufacturing system (FMS) is the best answer to such type of challenges. FMSs are integrated systems that can help users achieve the goals of increasing profitability through the increase of productivity. Although FMS can offer a number of potential benefits over conventional manufacturing systems, its implementation demands a high investment in capital but at high risk. For the purpose of avoiding costly mistakes and realizing the objectives and optimal productivity of FMS, there is a strong and justifiable need for extensive analysis and elaborate design of FMS before its implementation.

This research is aimed at examining the barriers and enablers in the implementation of FMS. An extensive literature review has been conducted to identify the gaps in the research area of FMS. A number of barriers and enablers

have been identified through the work of different researchers. Hypotheses were framed and a questionnaire-based survey instrument was developed. A survey was conducted to gain insights on various issues related to implementation of FMS. The descriptive statistics from the survey and hypotheses testing provide insights about the perceptions of Indian industries to the adoption and implementation of FMS. Interpretive Structural Modeling has been used to identify the relationships among important barriers and enablers in the implementation of FMS. Graph Theoretical Approach (GTA) has been utilized to find the feasibility of transition (FIT) value for any industry which is interested to convert its conventional manufacturing system into an FMS. GTA has, also, been used to find the index of barriers indicating the intensity of barriers in the implementation process of FMS. In addition to above, a new form of FMS has been proposed in this research work. This new form has been named as the humanized flexible manufacturing system (HFMS) which definitely cares for the human element. This system suggests the use of human element in the weak areas of FMS such as material handling, loading, scheduling and decision making.