An Overview of Agile Manufacturing

1 Jai Prakash  2 Dr. Rajesh Attri

1 M.Tech Scholar, YMCA University of Science and Technology, Faridabad, Haryana, India.

2 Assistant Professor, Mechanical Engineering Department, YMCA University of Science and Technology, Faridabad, Haryana, India.

Abstract
About a decade ago, the agile manufacturing archetype was formulated in response to the constantly changing ‘new economy as a basis for returning to global competitiveness. While agility means different things to different enterprises under diverse contexts, the following elements incarcerate its essential concept: agility is characterized by cooperativeness and synergism (possibly resulting in virtual corporations), by a strategic vision that enables thriving in face of continuous and volatile change, by the responsive conception and delivery of customer-valued, high quality and mass-produced goods/services, by quick organization structures of a knowledgeable and empowered workforce, and facilitated by an information infrastructure that associates constituent partners in a unified electronic network. During this period, a major amount of attention from both the academic and industrial communities has produced a large body of results in research and development related to this topic. Each contribution has tackled a different aspect of this large field.

Keywords: Agile Manufacturing, Lean Manufacturing, Leagile Manufacturing.

INTRODUCTION
World-class performance is a poignant target that requires constant attention and effort; the process is a never finishing journey. In the past, economies of scale ruled the manufacturing world and everybody knew that mass production and full exploitation of plant capacity was the only way to make money. This approach of
manufacturing resulted in inflexible plants that could not be easily arranged, and were associated with bloated raw materials, work-in-process and finished goods inventories. In the 1990s, industry leaders were trying to formulate a new exemplar for successful manufacturing enterprises in the 21st century; even though many manufacturing firms were still under pressure to implement lean production concepts. In 1991, a group of more than 150 industry executives participate in a study. Their efforts resulted in a two-volume report titled ‘21st Century Manufacturing Enterprise Strategy’, which suggests how US industrial competitiveness will or might develop during the next 15 years. As a result, the Agile Manufacturing Enterprise Forum (AMEF), joined with the Iacocca Institute at Lehigh University, was formed and the concept of agile manufacturing was introduced (Sheridan 1993, Struebing 1995, Richards 1996).

Lean manufacturing is a reply to competitive pressures with limited resources. Agile manufacturing, on the other hand, is a reaction to complexity brought about by constant change (Sanchez, ML. and Nagi, R. 2001). Lean is a collection of operational techniques focused on productive use of resources. Agility is an overall strategy focused on flourishing in an unpredictable environment. Focusing on the individual customer, agile competition has evolved from the unilateral producer-centric customer-responsive companies inspired by the lean manufacturing refinement of mass production to interactive producer-customer relationships (Goldman et al., 1994). In a similar intellect, some researchers contrast flexible manufacturing systems (FMS) and agile manufacturing systems (AMS) according to the type of variation. FMS is reactive adaptation, while AMS is proactive adaptation. Agility enables enterprises to thrive in an environment of continuous and unanticipated change (Richards 1996).

**Definition of Agile Manufacturing**

Agile manufacturing is a key to solving a problem when there is turmoil in any issue. Agility is a strong sense, speed, lightness and quick and needs to creativity and innovation (Gilaninia ,shahram, Resvani, Mousa(2011) . Agility means the ability to dream in the field of manufacturing new products and ways of doing proper business (Shams & et al, 2007). Agility is a result of being aware to change, as a whole (identification of opportunities and challenges) in both the internal and the external environment and with proper capabilities in the use of resources to meet these changes at the right time and flexible form relevant for organization to run it effectively (Braunscheidel & Suresh, 2009). Organizational agility is thus the organization's ability to survive and flourish in an environment of constant change and unpredictable (Karami, 2007).
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**Agility Capability**
Agility capabilities are the organizational ability by which it can respond to varied demands of customers with the minimum lead time. These capabilities must be imbibed in an organization so that it can pave a first step towards agility.

1) **Flexibility:** It is the ability of the organization to adapt to the changes in the inputs. It is very much needed in the modern day competitive world where the most flexible one only survives. Flexibility also implies quick adjustment to changes. There are different types of flexibilities.
   a) Flexibility in volume of production.
   b) Flexibility in product variety.
   c) Flexibility in all the departments of product development.
   d) Flexibility of the working staff.

2) **Quickness:** It is the ability to perform the operations rapidly:
   a) Quickness in new product design.
   b) Quickness in reducing the lead time of the product received by customer.
   c) Reduction of the operational cycle time.

3) **Responsiveness:** The ability to judge and respond to rapid changes in the enterprise. It consists of:
   a) Responsiveness in predicting the technological changes
   b) Immediate and rapid response to competition.
   c) Responsiveness in government policies
   d) Responsiveness in customer identification.
   e) Responsive in taking the feedback from the customer.

**CONCLUSION**
Agility is a new way to act in response to organizational changing and development factors. In fact, organizational agility is as a new model of an engineering organization and competitive agency. Agility is a strong sense, speed, lightness and quick and needs to creativity and innovation. The aim of agile manufacturing is to
enrich and honor customers and maintaining employee satisfaction and survival of market share, that basically have a set of capabilities to respond suitably to changes occurred in the business environment. For these reason organizations require agility.

REFERENCES