

Chapter MP3 script 41

New Technology in Manufacturing

In this recording we summarise the content of chapter 41 New Technology in Manufacturing. Studying this chapter should help you review the use of ERP systems in manufacturing; evaluate the role of technology in manufacturing; distinguish CAD from CAM; explain what is meant by CIM and what a Flexible Manufacturing System (FMS) is; .

Introducing the chapter, the authors start with 1. In chapter 39 we discussed types of production (job shops, batch and mass production) and in chapter 40 discussed continuous improvement through aides to manufacture. Kalpakjian, Schmid and Kok (2010) also discuss the general types of production but additionally describe a wide range of specific manufacturing processes; methods to produce components for a product. For example, there are casting processes, bulk deformation, sheet metal forming, polymer processing, machining and finishing and joining processes. In this chapter we are concerned with the application of technology to the different operations processes (work) and the manufacturing organisation holistically.

2. When considering the application of technology we may focus on the needs of management, knowledge and administrative workers or we may focus on the specific work tasks of those directly involved in creating goods. This chapter is therefore divided into two parts. The first considers new technology from a more general management and holistic business perspective and the second considers more specific technologies used to aid manufacturing tasks and methods.

3. When considering the application of technology to manufacturing it is useful to consider general trends. Kalpakjian, Schmid and Kok (2010) suggest that product variety and complexity continue to increase, product life cycles are becoming shorter, markets are becoming more global and market conditions fluctuate widely, customers are consistently demanding high-quality and low-cost products and on-time delivery. The goals in manufacturing view operations activities in a holistic systematic manner. Organisations seek to build quality into the product at each stage of its production, adopt the most flexible, economical and environmentally friendly methods, aim for high levels of productivity, eliminate waste, provide dependable and on-time deliveries and seek continuous improvement. Manufacturers apply IT to all aspects of production. The trends and goals set the context for the aspirations of manufacturing organisations. Before we consider the management perspective in detail we will briefly explore the evolution of operations..

The key concepts discussed within this chapter are:

Automation - The use of control systems (such as numerical control) and information technologies (such as CAD, CAM and robotics) reducing the need for or enhancing human intervention and leading to enhanced productivity; Computer-aided design (CAD) software - Software that allows designers to design and "build" production prototypes, "test" them as a computer object under given parameters, compile parts and quantity lists, outline production and assembly procedures, and then transmit the final design directly to milling and rolling machines.; Computer-aided manufacturing (CAM) software - Software that uses a digital design such as that from a CAD system to directly control production machinery.; Enterprise resource planning (ERP) systems - Large, integrated, computer-based business transaction processing and reporting systems. ERP systems pull together all of the classic business functions such as accounting, finance, sales, and operations into a single, tightly integrated package that uses a common database; flexible manufacturing systems - Two or more computer controlled machines or robots linked by automated handling devices such as transfer machines, conveyors, and transport systems. Computers direct the overall sequence of operations and route the work to the appropriate machine, select and load the proper tools, and control the operations performed by the machine; robot - A programmable machine designed to handle materials or tools in the performance of a variety of tasks; .

Other terms discussed include:

Computer integrated manufacturing (CIM); .

Summarising and concluding, the author(s) make the following comments - 25. In this chapter we evaluated the role of technology in manufacturing, from the general and specific manufacturing standpoints. Initially focussing on information flows, we discussed the use of ERP systems in manufacturing. ERP systems and broader ES integrate the parts of the organisation, its value and supply chain, to make the organisation more responsive and efficient. In the second part we considered Computer integrated manufacturing. CIM systems have become the most important means of improving productivity, responding to changing market demands, and enhancing the control of manufacturing and management functions. Both sets of technologies represent efforts to integrate operations and processes in order to make manufacturers more effective and efficient..

We have now reached the end of the chapter 'New Technology in Manufacturing'.

There are a number of references for this chapter where further reading opportunities are identified for you.