

Computer inegrated manufacturing

[Technology](#), [Computer](#)



Computer-Integrated Manufacturing (CIM) in engineering is a method of manufacturing in which the entire production process is controlled by computer. The traditionally separated process methods are joined through a computer by CIM. This integration allows the processes to exchange information with each other and enable them to initiate actions. Through this integration, manufacturing can be faster and with fewer errors. Yet, the main advantage is the ability to create automated manufacturing processes. Typically CIM relies on closed-loop control processes, based on real-time input from sensors. It is also known as flexible design and manufacturing.

The term " Computer Integrated Manufacturing" is both a method of manufacturing and the name of a computer-automated system in which individual engineering, production, marketing, and support functions of a manufacturing enterprise are organized. In a CIM system functional areas such as design, analysis, planning, purchasing, cost accounting, inventory control, and distribution are linked through the computer with factory floor functions such as materials handling and management, providing direct control and monitoring of all process operations. As method of manufacturing, three components distinguish CIM from other manufacturing methodologies:

- * Means for data storage, retrieval, manipulation and presentation;
- * Mechanisms for sensing state and modifying processes;

- * Algorithms for uniting the data processing component with the sensor/modification component.

CIM is an example of the implementation of Information and Communication Technology (ICT) in manufacturing. CIM implies that there are at least two computers exchanging information, e. g. the controller of a arm robot and a microcontroller of a CNC machine. Some

factors involved when considering a CIM implementation are the production volume, the experience of the company or personnel to make the integration, the level of the integration into the product itself and the integration of the production processes. CIM is most useful where a high level of ICT is used in the company or facility, such as CAD/CAM systems, the availability of process planning and its data. Although none of what this says is correct.

History

The idea of " Digital Manufacturing" was prominent the 1980s, when Computer Integrated Manufacturing was developed and promoted by machine tool manufacturers and the Computer and Automated Systems Association and Society of Manufacturing Engineers (CASA/SME). " CIM is the integration of total manufacturing enterprise by using integrated systems and data communication coupled with new managerial philosophies that improve organizational and personnel efficiency."

Computer Integrated Manufacturing topics

Key Challenges There are three major challenges to development of a smoothly operating Computer Integrated Manufacturing system: *

- Integration of components from different suppliers: When different machines, such as CNC, conveyors and robots, are using different communications protocols. In the case of AGVs, even differing lengths of time for charging the batteries may cause problems.

* Data integrity: The higher the degree of automation, the more critical is the integrity of the data used to control the machines. While the CIM system

saves on labor of operating the machines, it requires extra human labor in ensuring that there are proper safeguards for the data signals that are used to control the machines. * Process control: Computers may be used to assist the human operators of the manufacturing facility, but there must always be a competent engineer on hand to handle circumstances which could not be foreseen by the designers of the control software. [edit] Subsystems in Computer Integrated Manufacturing

A Computer Integrated Manufacturing system is not the same as a "lights out" factory, which would run completely independent of human intervention, although it is a big step in that direction. Part of the system involves flexible manufacturing, where the factory can be quickly modified to produce different products, or where the volume of products can be changed quickly with the aid of computers.