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Chapter 1 : Production management | industrial engineering | calendrierdelascience.com

Production and Manufacturing System Management: Coordination Approaches and Multi-Site Planning presents relevant theoretical frameworks and most recent research findings in this area. This extensive collection of works provides significant theories for research students and scholars to carry out their continuous research as well as.

These elements of information are needed for the development of master schedules for production. The flow of information for production planning can be explained by the following chart: Information System for Scheduling: Planners generally carry out scheduling in three steps: This involves Master Scheduling. The second and third steps are done through production scheduling. Master schedule is the first step towards production planning. It authorises planning sections to make detailed plans for the availability of materials and utilisation of plant capacity with the aim of maximum economy to the company. The placing of an order in a given priority class establishes the relative importance of the order as compared to other order received and sometimes as compared to work already scheduled but not yet processed. For most repetitive manufacturing systems the master schedule is a comparatively simple form showing the quantities of each type of product to be made in a given period. Here the information about the output capacity and time required for the production cycle is drawn from past experience. Production scheduling details first require, scheduling within an order so as to reduce the overall processing time, to speed the turn-over of work in process and to minimise the strategic and misplacement of completed parts by deferring their production until they are needed. Scheduling within an order may include the setting of successive beginning times for engineering of products, tooling up and processing materials. Scheduling the order of work for machine loading fixes calendar dates for beginning and ending of operations on plant equipment. The priority rating of an order work schedule. In a repetitive manufacturing concern production scheduling is largely a matter of increasing or diminishing the rate of output for parts and assemblies to conform with the master schedule. Consumer demand, customers delivery date, dealer and retailer inventories, lead time for procurement, transit time, cost of not meeting demand or delivery date. Finished goods inventories, lead time of starting production, number of operations and time of each operation, flow time, availability of equipment, personnel, material, economic production run, cost of in-process material, cost of carrying inventories, cost of increasing production capacity and cost of reducing process interval. Updating and Review of Planning Decisions: Thus there is a continual need of updating the information related to environmental parameters and then reviewing the decisions already taken to make modifications if necessary. Production control is the function of planning and controlling the production cycle to assure that facilities and the personnel are economically utilised and that products are manufactured within time and cost limits. Production control is responsible for ensuring timely availability of all the pre-requisites of production viz. The complexity of present day business is more prominent in the production control system, where the number of decisions may literally run to hundreds or even thousands a day. The fact is that situations recur and most decisions are based on considerations similar to the one encountered in the past. Systems approach enables to establish the decision rules such that repetitive situations can be handled routinely. Control of job-order production is achieved by periodic checking and following up the progress of orders to assure that the work is being done on schedule. The dispatchers record the progress of work by observing the times and dates when work is completed and by making the appropriate notations on route sheets or schedule sheets. The planning office maintains a check on progress by receiving daily reports from dispatchers. In repetitive manufacturing system the control function becomes operative with the release of orders that set plans into motion. The plans establish flow rates for synchronized output of required parts for assembly. The aim of control is to maintain the scheduled rate of output, which is sufficient to satisfy demand, and also keeps inventories of parts, raw materials and finished goods at a practical minimum. Planners compare actual with planned output and take prompt corrective action to rectify deviations. Control charts can be used to control production of finished goods. Weekly or daily reports on the amount of finished units

produced are plotted against scheduled output. Control charts for key parts and sub-assemblies can show whether the rates of output for components and sub-assemblies are sufficiently synchronized and in balance. A control chart for all items in production can provide a comprehensive picture of a plant output performance. Production control system needs following information: Production control then prepares a master schedule of material requirements that are based on the demand forecasts and bills of materials. Materials Management Information Systems: The economic working of business enterprises requires that the available capital resources are used most judiciously. Thus attempt to organize information in materials management viz. In this case the information system must meet needs of the total material planning within the company e. The system has to cater the needs of material for purchasing department, production objectives and capacity planning. Objectives of integrated approach in materials management can be: Value analysis, waste control and import substitution. An integrated approach to materials management must look at all the above problem areas in a co-ordinated manner. The information needs for purchase management can be: The information system for purchase management can be: The information needs for store management can be: The design of stores control information system can be: Information needs for inventory system are: In inventory systems the flow of information depends on the nature of the system i. Two-Bin system or Base stock control system. The salient features of the base stock control system are: Its role and functions are to see that the production order meet the marketing requirements and that the production cost for each product are kept minimum by properly scheduling the arrivals of materials as required at various phases of the production process. Usually the production manager in charge of production, planning and control also controls purchase and stores department.

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Chapter 2 : Production Management : itâ€™s Meaning, Definition, Function and Scope

Production and Manufacturing System Management by Paolo Renna has been drafted for readers to view a collected volume on maintaining and managing manufacturing facilities, their approach to work and meeting deadlines.

Meaning of Production Management: Production Management refers to the application of management principles to the production function in a factory. In other words, production management involves application of planning, organizing, directing and controlling the production process. The application of management to the field of production has been the result of at least three developments: Until the emergence of the concept of manufacturing, there was no such thing as management as we know it. It is true that people operated business of one type or another, but for the most part, these people were owners of business and did not regard themselves as managers as well, ii Essentially stems from the first, namely, the development of the large corporation with many owners and the necessity to hire people to operate the business, iii Stems from the work of many of the pioneers of scientific management who were able to demonstrate the value, from a performance and profit point of view, of some of the techniques they were developing. Definition of Production Management: It is observed that one cannot demarcate the beginning and end points of Production Management in an establishment. The reason is that it is interrelated with many other functional areas of business, viz. Alternately, Production Management is not independent of marketing, financial and personnel management due to which it is very difficult to formulate some single appropriate definition of Production Management. The following definitions try to explain main characteristics of production management: It lays stress on materialistic features only. So that the resulting goods and services are produced in accordance with the quantitative specifications and demand schedule with minimum cost. According to this definition design and control of the production system are two main functions of production management. This definition explains the main areas of an enterprise where the principles of production management can be applied. This definition clearly points out that production management is not a set of techniques. It is evident from above definitions that production planning and its control are the main characteristics of production management. In short, the main activities of production management can be listed as: Functions of Production Management: The definitions discussed above clearly shows that the concept of production management is related mainly to the organizations engaged in production of goods and services. Earlier these organizations were mostly in the form of one man shops having insignificant problems of managing the productions. But with development and expansion of production organizations in the shape of factories more complicated problems like location and lay out, inventory control, quality control, routing and scheduling of the production process etc. This resulted in the development of production management in the area of factory management. In the beginning the main function of production management was to control labour costs which at that time constituted the major proportion of costs associated with production. But with development of factory system towards mechanization and automation the indirect labour costs increased tremendously in comparison to direct labour costs, e. The planning and control of all these activities required more expertise and special techniques. In modern times production management has to perform a variety of functions, namely: However, the responsibility of determining the output characteristics and the distribution strategy followed by an organization including pricing and selling policies are normally outside the scope of Production Management. Scope of Production Management: The scope of production management is indeed vast. Commencing with the selection of location, production management covers such activities as acquisition of land, constructing building, procuring and installing machinery, purchasing and storing raw materials and converting them into saleable products. Added to the above are other related topics such as quality management, maintenance management, production planning and control, methods improvement and work simplification and other related areas.

Chapter 3 : Production and Operations Management - Meaning and Important Concepts

Related Production Management Videos Production Planning & Control for Automotive Manufacturing in the Cloud See how Plex helps manufacturers stay lean, control inventory, and minimize errors and waste for production planning and control.

The production manager must also choose the machines and methods of the company, first selecting the equipment and technology to be used in the manufacture of the product or service and then planning and controlling the methods and procedures for their use. The flexibility of the production process and the ability of workers to adapt to equipment and schedules are important issues in this phase of production management. The smoothness of resource movement and data flow is determined largely by the fundamental choices made in the design of the product and in the process to be used. A manager who allows excessive inventories to build up or who achieves level production and steady operation by sacrificing good customer service and timely delivery runs the risk that overinvestment or high current costs will wipe out any temporary competitive advantage that might have been obtained. The production manager must plan and control the process of production so that it moves smoothly at the required level of output while meeting cost and quality objectives. Process control has two purposes: When more than one product is involved, complex industrial engineering or operations research procedures are required to analyze the many factors that impinge on the problem. Inventory control is another important phase of production management. Inventories include raw materials, component parts, work in process, finished goods, packing and packaging materials, and general supplies. Although the effective use of financial resources is generally regarded as beyond the responsibility of production management, many manufacturing firms with large inventories some accounting for more than 50 percent of total assets usually hold production managers responsible for inventories. Not carrying an item can result in delays in getting needed parts or supplies, but carrying every item at every location can tie up huge amounts of capital and result in an accumulation of obsolete, unusable stock. Managers generally rely on mathematical models and computer systems developed by industrial engineers and operations researchers to handle the problems of inventory control. To control labour costs , managers must first measure the amount and type of work required to produce a product and then specify well-designed, efficient methods for accomplishing the necessary manufacturing tasks. The concepts of work measurement and time study introduced by Taylor and the Gilbreths, as well as incentive systems to motivate and reward high levels of worker output, are important tools in this area of management. In new operations particularly, it is important to anticipate human resource requirements and to translate them into recruiting and training programs so that a nucleus of appropriately skilled operators is available as production machinery and equipment are installed. Specialized groups responsible for support activities such as equipment maintenance, plant services and production scheduling, and control activities also need to be hired, trained, and properly equipped. This type of careful personnel planning reduces the chance that expensive capital equipment will stand idle and that effort, time, and materials will be wasted during start-up and regular operations. The effective use and control of materials often involves investigations of the causes of scrap and waste; this, in turn, can lead to alternative materials and handling methods to improve the production process. The importance of models and methods Because of the enormous complexity of typical production operations and the almost infinite number of changes that can be made and the alternatives that can be pursued, a productive body of quantitative methods has been developed to solve production management problems. Most of these techniques have emerged from the fields of industrial engineering, operations research, and systems engineering. Indeed, many mass production operations could not run without the support of these industrial engineers and technical specialists. The important aspects of production control are summarized in the Table.

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Chapter 4 : Types of Manufacturing Systems | Bizfluent

Production Management refers to the application of management principles to the production function in a factory. In other words, production management involves application of planning, organizing, directing and controlling the production process. (i) First is the development of factory system of.

Understanding Production and Operations Management Understanding Production and Operations Management Introduction The very essence of any business is to cater needs of customer by providing services and goods, and in process create value for customers and solve their problems. Production and operations management talks about applying business organization and management concepts in creation of goods and services. Production Production is a scientific process which involves transformation of raw material input into desired product or service output by adding economic value. Production can broadly categorize into following based on technique: It involves desired output is achieved through separation or extraction from raw materials. A classic example of separation or extraction is Oil into various fuel products. Production by modification or improvement: It involves change in chemical and mechanical parameters of the raw material without altering physical attributes of the raw material. Annealing process heating at high temperatures and then cooling , is example of production by modification or improvement. Car production and computer are example of production by assembly. Importance of Production Function and Production Management Successful organizations have well defined and efficient line function and support function. Production comes under the category of line function which directly affects customer experience and there by future of organization itself. Aim of production function is to add value to product or service which will create a strong and long lasting customer relationship or association. And this can be achieved by healthy and productive association between Marketing and Production people. Marketing function people are frontline representative of the company and provide insights to real product needs of customers. An effective planning and control on production parameters to achieve or create value for customers is called production management. Operations Management As to deliver value for customers in products and services, it is essential for the company to do the following: Operations management captures above identified 3 points. Production management deals with manufacturing of products like computer, car, etc while operations management cover both products and services. There is no participation of customer during production whereas for services a constant contact with customer is required. Production management and operations management both are very essential in meeting objective of an organization.

Chapter 5 : Operations management - Wikipedia

The adoption of production networks and distributed production planning is essential to the increase of competition and market globalization of manufacturing companies as well as Small and Medium Enterprises.

Challenge We form a long-term vision, meeting challenges with courage and creativity to realize our dreams. Kaizen We improve our business operations continuously, always driving for innovation and evolution. Genchi Genbutsu Go to the source to find the facts to make correct decisions. Respect for people[edit] Respect We respect others, make every effort to understand each other, take responsibility and do our best to build mutual trust. Teamwork We stimulate personal and professional growth, share the opportunities of development and maximize individual and team performance. External observers have summarized the principles of the Toyota Way as: The right process will produce the right results[edit] Create continuous process flow to bring problems to the surface. Use the "pull" system to avoid overproduction. Level out the workload heijunka. Work like the tortoise, not the hare. Build a culture of stopping to fix problems, to get quality right from the start. Jidoka Standardized tasks are the foundation for continuous improvement and employee empowerment. Use visual control so no problems are hidden. Use only reliable, thoroughly tested technology that serves your people and processes. Add value to the organization by developing your people and partners[edit] Grow leaders who thoroughly understand the work, live the philosophy, and teach it to others. Respect your extended network of partners and suppliers by challenging them and helping them improve. The Toyota production system has been compared to squeezing water from a dry towel. What this means is that it is a system for thorough waste elimination. Here, waste refers to anything which does not advance the process, everything that does not increase added value. Many people settle for eliminating the waste that everyone recognizes as waste. But much remains that simply has not yet been recognized as waste or that people are willing to tolerate. People had resigned themselves to certain problems, had become hostage to routine and abandoned the practice of problem-solving. This going back to basics, exposing the real significance of problems and then making fundamental improvements, can be witnessed throughout the Toyota Production System. Because of interest in the program from other organizations, Toyota began offering instruction in the methodology to others. Toyota has even "donated" its system to charities, providing its engineering staff and techniques to non-profits in an effort to increase their efficiency and thus ability to serve people. For example, Toyota assisted the Food Bank For New York City to significantly decrease waiting times at soup kitchens, packing times at a food distribution center, and waiting times in a food pantry. Some important concepts are: There is conflict on what the actual English translation of what "just in time" really means. But that part is not written down. A large lighted board used to alert floor supervisors to a problem at a specific station. Laying the groundwork, building consensus, literally: Clean and inspect [19].

Chapter 6 : Essay on Production Information System | Production Management

Sparta uses a stand-alone production management system for manufacturing that can be used by any manufacturing shop. This system is designed to help manufacturers build Sparta products more efficiently and gives project managers a tool to organize and interact with our drawings.

Glossary and Definitions Definition. Manufacturing Operations Management MOM systems are used to manage the creation, development, production, and distribution of products and services. MOM is an approach of overseeing all aspects of the manufacturing process, with a particular focus on increasing efficiency. MOM is the natural development to Manufacturing Execution System MES software , which expands focus from a single facility to the entire supply network; it also monitors a variety of aspects of the manufacturing process, including production capacity analysis, work-in-process inventory turns, and standard lead times. Typically MES applications were very loosely defined and could mean many things to many people. The MOM approach is more structured. There are many types of MOM software, including for production management, performance analysis, quality and compliance, and human machine interface HMI. Production management software provides real-time information about jobs and orders, labor and materials, machine status, and product shipments. Performance analysis software displays metrics at the machine, line, plant and enterprise level for situational or historical analysis. Quality and compliance software is used to promote compliance with standards and specifications for operational processes and procedures. HMI software is a form of manufacturing operations management MOM software that enables operators to manage industrial and process control machinery using a computer-based interface. In the late s, the industrial engineering department at Purdue University created one of the first functional activity models for business processes and enabling technology for plant operations. Over time, this work has been taken further by many organizations that have developed more sophisticated models of MOM. APICS previously known as American Production and Inventory Control Society and now known as the Association for Operations Management , also defines operations management in terms of planning, scheduling and control activities that transform inputs into finished goods and services. One of the principal standards relating to MOM is ISA, the international standard for the integration of enterprise and control systems. ISA consists of models and terminology. But the standards title does little to provide any information regarding its value. Leveraging this standard can bring company-wide perspective to system integration that allows you to take thousands of actions and data points and boil them down in an understandable framework. It focuses on activitiesâ€”and it is meant to define and integrate the activities between business and ERP on one hand and MES, MOM and operations management on the other. The standard even covers the detailed level of sensors and the physical processes. These models can be used to determine which information has to be exchanged between systems for sales, finance, and logistics, and systems for production, maintenance, and quality. The ISA standard can be used for several purposes, for example as a guide for the definition of user requirements, for the selection of MES suppliers, or as a basis for the development of MES systems and databases. ISA incorporates the layers model of technology and business process for manufacturing enterprises as levels for the standard. Level 0 Defines the actual physical processes. Level 1 Defines the activities involved in sensing and manipulating the physical processes. Level 2 Defines the activities of monitoring and controlling the physical processes. Level 3 Defines the activities of workflow to produce the desired end products. Level 4 Defines the business-related activities needed to manage a manufacturing operation. Manufacturing Operations Management systems reside in Level 3 of the model. From a component or software perspective, Levels 1 to 4 can be seen like this:

Chapter 7 : Top 10 Best Manufacturing Information Systems and DMS Integrations

ME Production Management 4 | P a g e Manufacturing systems include the logical groupings of equipment and workers in the factory. A combination of a group of workers and machines are termed as Production line.

History[edit] The history of production and operation systems began around B. The next major historical application of operation systems occurred in B. It was during this time that the Egyptians started using planning , organization , and control in large projects such as the construction of the pyramids. In large cities, on the other hand, inasmuch as many people have demands to make upon each branch of industry, one trade alone, and very often even less than a whole trade, is enough to support a man: It follows, therefore, as a matter of course, that he who devotes himself to a very highly specialized line of work is bound to do it in the best possible manner. This hierarchical organization in which people were divided into classes based on social position and wealth became known as the feudal system. Although a large part of labor was employed in agriculture, artisans contributed to economic output and formed guilds. The guild system, operating mainly between and , consisted of two types: Although guilds were regulated as to the quality of work performed, the resulting system was rather rigid, shoemakers , for example, were prohibited from tanning hides. They provided service to the nobility for cooking, cleaning and entertainment. Court jesters were service providers. The medieval army could also be considered a service since they defended the nobility. The industrial revolution was facilitated by two elements: Division of labor has always been a feature from the beginning of civilization , the extent to which the division is carried out varied considerably depending on period and location. Compared to the Middle Ages, the Renaissance and the Age of Discovery were characterized by a greater specialization in labor, one of the characteristics of growing European cities and trade. It was in the late eighteenth century that Eli Whitney popularized the concept of interchangeability of parts when he manufactured 10, muskets. Up to this point in the history of manufacturing, each product e. Interchangeability of parts allowed the mass production of parts independent of the final products in which they would be used. In , Frederick Winslow Taylor introduced the stopwatch method for accurately measuring the time to perform each single task of a complicated job. He developed the scientific study of productivity and identifying how to coordinate different tasks to eliminate wasting of time and increase the quality of work. The next generation of scientific study occurred with the development of work sampling and predetermined motion time systems PMTS. Work sampling is used to measure the random variable associated with the time of each task. PMTS allows the use of standard predetermined tables of the smallest body movements e. PMTS has gained substantial importance due to the fact that it can predict work measurements without observing the actual work. The Gilbreths took advantage of taking motion pictures at known time intervals while operators were performing the given task. At the turn of the twentieth century, the services industries were already developed, but largely fragmented. In the U. Services were largely local in nature except for railroads and telegraph and owned by entrepreneurs and families. Ransom Olds was the first to manufacture cars using the assembly line system, but Henry Ford developed the first auto assembly system where a car chassis was moved through the assembly line by a conveyor belt while workers added components to it until the car was completed. During World War II, the growth of computing power led to further development of efficient manufacturing methods and the use of advanced mathematical and statistical tools. This was supported by the development of academic programs in industrial and systems engineering disciplines, as well as fields of operations research and management science as multi-disciplinary fields of problem solving. While systems engineering concentrated on the broad characteristics of the relationships between inputs and outputs of generic systems, operations researchers concentrated on solving specific and focused problems. The synergy of operations research and systems engineering allowed for the realization of solving large scale and complex problems in the modern era. Recently, the development of faster and smaller computers, intelligent systems , and the World Wide Web has opened new opportunities for operations, manufacturing, production, and service

systems. The textile industry is the prototypical example of the English industrial revolution. Industrial Revolution and Productivity improving technologies historical Before the First industrial revolution work was mainly done through two systems: In the domestic system merchants took materials to homes where artisans performed the necessary work, craft guilds on the other hand were associations of artisans which passed work from one shop to another, for example: The beginning of the industrial revolution is usually associated with 18th century English textile industry , with the invention of flying shuttle by John Kay in , the spinning jenny by James Hargreaves in , the water frame by Richard Arkwright in and the steam engine by James Watt in In at the Crystal Palace Exhibition the term American system of manufacturing was used to describe the new approach that was evolving in the United States of America which was based on two central features: The model T car was introduced in , however it was not until Ford implemented the assembly line concept, that his vision of making a popular car affordable by every middle-class American citizen would be realized. The first factory in which Henry Ford used the concept of the assembly line was Highland Park , he characterized the system as follows: That is the real principle of our production, and conveyors are only one of many means to an end" [9] This became one the central ideas that led to mass production , one of the main elements of the Second Industrial Revolution , along with emergence of the electrical industry and petroleum industry. The post-industrial economy was noted in by Daniel Bell. Since all sectors are highly interconnected, this did not reflect less importance for manufacturing, agriculture, and mining but just a shift in the type of economic activity. Operations management[edit] Although productivity benefited considerably from technological inventions and division of labor, the problem of systematic measurement of performances and the calculation of these by the use of formulas remained somewhat unexplored until Frederick Taylor, whose early work focused on developing what he called a "differential piece-rate system" [11] and a series of experiments, measurements and formulas dealing with cutting metals [12] and manual labor. One of the problems Taylor believed could be solved with this system, was the problem of soldiering: In Taylor published his "The Principles of Scientific Management", [14] in which he characterized scientific management also known as Taylorism as: The development of a true science ; The scientific selection of the worker ; The scientific education and development of the worker; Intimate friendly cooperation between the management and the workers. Taylor is also credited for developing stopwatch time study, this combined with Frank and Lillian Gilbreth motion study gave way to time and motion study which is centered on the concepts of standard method and standard time. Frank Gilbreth is also responsible for introducing the flow process chart in Also in Hugo Diemer published the first industrial engineering book: Factory Organization and Administration. In Ford Whitman Harris published his "How many parts to make at once" in which he presented the idea of the economic order quantity model. He described the problem as follows: Experience has shown one manager a way to determine the economical size of lots" [16] This paper inspired a large body of mathematical literature focusing on the problem of production planning and inventory control. In Walter Shewhart introduced the control chart through a technical memorandum while working at Bell Labs , central to his method was the distinction between common cause and special cause of variation. In the s methods-time measurement MTM was developed by H. MTM was the first of a series of predetermined motion time systems , predetermined in the sense that estimates of time are not determined in loco but are derived from an industry standard. This was explained by its originators in a book they published in called "Method-Time Measurement". Harris to the more elaborate techniques of the calculus of variations developed by Euler in or the multipliers employed by Lagrange in , and computers were slowly being developed, first as analog computers by Sir William Thomson and James Thomson moving to the eletromechanical computers of Konrad Zuse and During World War II however, the development of mathematical optimization went through a major boost with the development of the Colossus computer , the first electronic digital computer that was all programmable, and the possibility to computationally solve large linear programming problems, first by Kantorovich [20] in working for the Soviet government and latter on in with the simplex method of Dantzig. These methods are known today as belonging to the field of operations research. From this point on a curious development took place: Toyota

evolved a unique manufacturing system centered on two complementary notions: SPC and worker responsibility over quality Easy able -to-see quality: Plossl and Oliver W. One of the key insights of this management system was the distinction between dependent demand and independent demand. Independent demand is demand which originates outside of the production system, therefore not directly controllable, and dependent demand is demand for components of final products, therefore subject to being directly controllable by management through the bill of materials , via product design. Orlicky wrote "Materials Requirement Planning" in , [26] the first hard cover book on the subject. Enterprise resource planning ERP is the modern software architecture, which addresses, besides production operations, distribution , accounting , human resources and procurement. Dramatic changes were occurring in the service industries, as well. While modeled after manufacturing in the production of the food in the back-room, the service in the front-room was defined and oriented to the customer. This was based on the innovative idea of flying all packages into the single airport in Memphis Tenn by midnight each day, resorting the packages for delivery to destinations and then flying them back out the next morning for delivery to numerous locations. This concept of a fast package delivery system created a whole new industry, and eventually allowed fast delivery of online orders by Amazon and other retailers. This was accomplished by adhering to their system of delivering the goods and the service to the customers at the lowest possible cost. The operations system included careful selection of merchandise, low cost sourcing, ownership of transportation, cross-docking, efficient location of stores and friendly home-town service to the customer. There standards apply to both manufacturing and service organizations. There has been some controversy regarding the proper procedures to follow and the amount of paperwork involved, but much of that has improved in current ISO revisions. With the coming of the Internet, in Amazon devised a service system of on-line retailing and distribution. With this innovative system customers were able to search for products they might like to buy, enter the order for the product, pay online, and track delivery of the product to their location, all in two days. This required not only very large computer operations, but dispersed warehouses, and an efficient transportation system. Service to customers including a high merchandise assortment, return services of purchases, and fast delivery is at the forefront of this business. Recent trends in the field revolve around concepts such as: Business Process Re-engineering launched by Michael Hammer in [32]: BPR seeks to help companies radically restructure their organizations by focusing on the ground-up design of their business processes. Lean systems is a systemic method for the elimination of waste " Muda " within a manufacturing or service process. Lean also takes into account waste created through overburden " Muri " and waste created through unevenness in work loads " Mura ". The term lean manufacturing was coined in the book The Machine that Changed the World. Six Sigma an approach to quality developed at Motorola between Six Sigma refers to control limits placed at six 6 standard deviations from the mean of a normal distribution , this became very famous after Jack Welch of General Electric launched a company-wide initiative in to adopt this set of methods to all manufacturing, service and administrative processes. Production systems[edit] In a job shop machines are grouped by technological similarities regarding transformation processes, therefore a single shop can work very different products in this picture four colors. Also notice that in this drawing each shop contains a single machine. Usually in the back there is a similar system for managing the set of tools required for different machining operations. A production system comprises both the technological elements machines and tools and organizational behavior division of labor and information flow. A first possible distinction in production systems technological classification is between continuous process production and discrete part production manufacturing. Another possible classification [36] is one based on Lead Time manufacturing lead time vs delivery lead time: According to this classification different kinds of systems will have different customer order decoupling points CODP , meaning that work in progress WIP cycle stock levels are practically nonexistent regarding operations located after the CODP except for WIP due to queues. See Order fulfillment The concept of production systems can be expanded to the service sector world keeping in mind that services have some fundamental differences in respect to material goods: Services can be classified according to a service process matrix:

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Chapter 8 : Toyota Production System - Wikipedia

The Toyota Production System (TPS) is an integrated socio-technical system, developed by Toyota, that comprises its management philosophy and practices. The TPS organizes manufacturing and logistics for the automobile manufacturer, including interaction with suppliers and customers.

Having the appropriate manufacturing system for your product can yield a variety of benefits including the ability to maintain the high quality of your goods, being more efficient in your production processes and saving money across the board. The right system can also help you produce higher volumes, thereby meeting your production volume targets. Dorf and Andrew Kusiak, there are four types of manufacturing systems: Custom manufacturing, intermittent manufacturing, continuous manufacturing and flexible manufacturing. Custom Manufacturing Custom manufacturing is by far the oldest and most popular type of manufacturing system in existence. It also happens to be associated with both the highest-quality products and the lowest-volume efficiency. In the custom manufacturing system, each item is produced by a single craftsperson, who works solely by hand or with the help of a machine. When machines are used, they tend to be highly specialized to their task and cannot produce more than one item at a time. This system will tend to have the highest unit cost for the product manufactured. As a result, custom-manufactured products are of the highest quality but are also the most expensive products in the market. Intermittent Manufacturing The intermittent manufacturing system is designed to produce large amounts of a single product at one time. The products made using this manufacturing system are almost identical to each other and feature very little differentiation which simplifies the manufacturing process. Customization is typically done post-purchase. Video of the Day Brought to you by Techwalla Brought to you by Techwalla Continuous Manufacturing Continuous manufacturing systems are designed to enable the mass production of a single product. The product goes through an assembly line with different stations where parts are added or worked on a little further. This system first arose during the Industrial Revolution and is most closely associated with the Ford Company, which employed the system to produce Model Ts in the s. This type of production system is ideal when a company has very high volume targets since it reduces the unit cost of the product. It does, however, require a massive capital injection at startup due to the investment in equipment and labor required. Flexible Manufacturing Flexible manufacturing is a modern manufacturing system that has become very popular. It involves a significant investment in machinery, although it reduces labor costs by implementing robots eschewing human labor altogether. These machines can easily be reconfigured to manufacture different products in different quantities, and the whole process is automatic. It is called flexible manufacturing due to the flexibility in the variety of high-volume products it can produce. Due to the automated process, quality control is a lot easier, and unit costs are low.

Chapter 9 : Journal of Manufacturing Systems - Elsevier

Manufacturing Production Software. So, whether you're a make to order, configure to order, engineer to order, or simply a make to stock business, our production management software is complemented with a full range of supply chain management, supply chain execution and distribution capabilitiesâ€”all delivered within a single business platform.