**African Institute for Project Management Studies**

**(AIPMS)**

Course: Diploma in Logistic and Procurement Management

Assignment.

Module: Four

(Procurement and Supply Chain Management)

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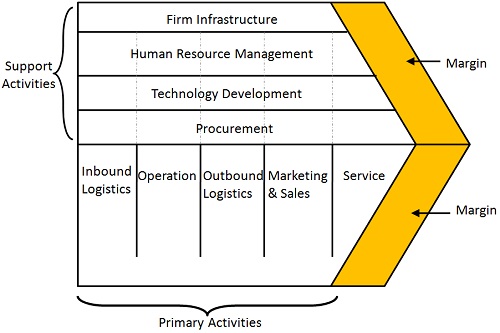
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1. **What is Value chain analysis and what its main elements?**

According to BusinessJargon.com article (Jan 2019), Value chain analysis is a way to visually analyze a company's business activities to see how the company can create a competitive advantage for itself. Value chain analysis helps a company understands how it adds value to something and subsequently how it can sell its product or service for more than the cost of adding the value, thereby generating a profit margin. In other words, if they are run efficiently the value obtained should exceed the costs of running them i.e. customers should return to the organisation and transact freely and willingly.

Value chain analysis is a process of dividing various activities of the business in primary and support activities and analyzing them, keeping in mind, their contribution towards value creation to the final product. And to do so, inputs consumed by the activity and outputs generated are studied, to decrease costs and increase differentiation.

Value chain analysis is used as a tool for identifying activities, within and around the firm and relating these activities to an assessment of competitive strength.



Source: Businessjargon.com.

Value Chain Analysis elements are mainly grouped into primary or line activities, and support activities discussed as under:

**Primary elements**: The functions, which are directly concerned with the conversion of input into output and distribution activities, are called primary activities/elements. It includes:

* Inbound Logistics: It includes a range of activities like receiving, storing, distributing, etc., which make available goods and services for operational processes. Some of those activities are material handling, transportation, stock control, etc.
* Operations: The activity of transforming input raw material to final product ready for sale is termed as operation. Machining, assembling, packaging are the activities covered under operations.
* Outbound Logistics: As the name suggests, the activities that help in collecting, storage and delivering the product to the customer is outbound logistics.
* Marketing and Sales: All the activities like advertising, promotion, sales, marketing research, public relations, etc. performed to make the customer aware of the product or service and create demand for it, comes under marketing.
* Service: Service means service provided to the customer to improve or maintain the value of the product. It includes financing service, after-sales service and so on.

**Support elements/Activities:** Those activities, which assist primary activities in accomplishment, are support activities. These are:

* Procurement: This activity serves the organization, by supplying all the necessary inputs like material, machinery or other consumable items, that required by the organization for performing primary activities.
* Technology Development: At present, technology development requires heavy investment, which takes years for research and development. However, its benefits can be enjoyed for several years and by a multitude of users in the organization.
* Human Resource Management: It is the most common plus important activity which excel all primary activities of the organization. It encompasses overseeing the selection, retention, promotion, transfer, appraisal and dismissal of staff.
* Infrastructure: This is the management system, which provides its services to the whole organization and includes planning, finance, information management, quality control, legal, government affairs, etc.

In the fast-paced world, the focus of the organization is customer satisfaction, and value chain analysis is the technique that helps to attain that level. Under this, each business activity is considered as essential, which contributes value and is constantly analyzed, to increase value as regards the cost incurred.

1. **What are the seven variables which production personnel‘s should zero in?**

According to economics online journal (2019), Production function refers to the relationship between the input of factor services and the output of the resultant product. The production function is based on the idea that the amount of output in a production process depends upon the amount of inputs used in the process.

The seven variables, which production personnel should zero on according to economics online journal, include,

* Labor as a Factor: Labor as a variable factor of production refers to the effort expended by an individual to bring a product or service to the market. Again, it can take on various forms. For example, the construction worker at a hotel site is part of labor as is the waiter who serves guests or the receptionist who enrolls them into the hotel. Within the software industry, labor refers to the work done by project managers and developers in building the final product. Even an artist involved in making art, whether it is a painting or a symphony, is considered labor. For the early political economists, labor was the primary driver of economic value.
* Raw materials: Raw materials are variable factors of production that change with the level of increase or decrease in productions if output increase the level of raw materials needed for production increases and if production decreases the level of raw materials needed decrease.
* Energy: most production uses a unit energy inform of electric or bio energy to produce a unit of product. The increase in number of products produced in a day result to an increase in the units/amount of energy consumed/used for the productions process and a decrease in energy may result to a decrease in units of products produced in a day.
* Capital as a Factor: In economics, capital typically refers to money. However, money is not a factor of production because it is not directly involved in producing a good or service. Instead, it facilitates the processes used in production by enabling entrepreneurs and company owners to purchase capital goods or land or pay wages. For modern mainstream (neoclassical) economists, capital is the primary driver of value. As a factor of production, capital refers to the purchase of goods made with money in production. For example, a tractor purchased for farming is capital. Along the same lines, desks and chairs used in an office are also capital.
* Entrepreneurship: An entrepreneur is someone who takes on the risk and brings the other three factors of production together. Entrepreneurs are a vital engine of economic growth, helping to build some of the largest firms in the world as well as some of the small businesses in your neighborhood. The payment an entrepreneur receives is called profit as a reward for the risk they take.
* Time: Time is one of the variable factors of production that varies with the level of production. When there is increase in time for production this result to an increase in units of products produced and when there is a decrease in time for production there is decrease in the units of products produced be specific period. Production personnel should therefore zero in either increasing the time to increase production or decrease time to reduce production.
* Land as a Factor: land becomes variable factor of production in the long run. Land has a broad definition as a factor of production and can take on various forms, from agricultural land to commercial real estate to the resources available from a particular piece of land. Natural resources, such as oil and gold, can be extracted and refined for human consumption from the land. Cultivation of crops on land by farmers increases its value and utility. While the land is an essential component of most ventures, its importance can diminish or increase based on industry. For example, a technology company can easily begin operations with zero investment in land. On the other hand, the land is the most significant investment for a real estate venture.

1. **What is Just in Time management system? Is JIT utopia? Can it be made to work? What is its philosophic approach in terms of Batch size?**

According to manufacturing tomorrow.com article (2017), Just-in-time (JIT), is a stratagem that manufacturers utilize to increase efficiency and decrease waste by receiving goods only as they are needed in the manufacturing process, thereby reducing the cost of inventory. Importantly, manufacturers must forecast their requirements accurately.

**It is utopia/ideal and can be made to work through the following ways;**

* Reduction of Inventory Costs: Using a Just-in-Time inventory system reduces the amount of material on hand in the production facility. Companies can reduce the cost to store, maintain excess inventory, and eliminate the risk of materials becoming obsolete while in storage. High inventory quantities tie up company funds, which could otherwise benefit other areas of the business such as the research and development of new products. With the reduction in inventory costs, companies can expand and grow their businesses.
* Lead Time Reduction: Just-in-Time manufacturing also uses a pull system to move materials through the production cycle. For example, in a manufacturing business, materials do not move to the next step on an assembly line until that step or station is ready. This reduces the stockpiling of unfinished product at any stage in the production process. When the company eliminates bottlenecks, production speed or lead-time is faster. Process engineers must determine the maximum quantity any station in the production process can have waiting. While workers may sit idle waiting to move production to the next step, the process is more efficient.
* Efficient Manufacturing Layout: Companies must create a layout on the production floor to move materials through the process efficiently. Some companies must move workstations closer together to eliminate steps in the work process. This leads to a more efficient manufacturing layout that can significantly reduce lead-time. Building products efficiently is a primary focus for a company implementing a lean manufacturing system.
* Improve Customer Satisfaction: Companies implement a Just-in-Time system or lean manufacturing to satisfy the demands of customers. The voice of the customer is always present in a Just-in-Time manufacturing environment. Reductions in lead-time and costs can help a company deliver a product to the customer faster and for a lower price.

**The philosophic approach Juts in Time in terms of Batch size**

JIT is a Japanese management philosophy, which has been applied in practice since the early 1970s in many Japanese manufacturing organizations. It was first developed and perfected within the Toyota manufacturing plants by Taiichi Ohno as a means of meeting consumer demands with minimum delays. Taiichi Ohno is frequently referred to as the father of JIT.

Toyota was able to meet the increasing challenges for survival through an approach that focused on people, plants and systems. Toyota realised that JIT would only be successful if every individual within the organisation was involved and committed to it, if the plant and processes were arranged for maximum output and efficiency, and if quality and production programs were scheduled to meet demands exactly.

JIT manufacturing has the capacity, when properly adapted to the organisation, to strengthen the organization’s competitiveness in the marketplace substantially by reducing wastes and improving product quality and efficiency of production.

There are strong cultural aspects associated with the emergence of JIT in Japan. The Japanese work ethic involves the following concepts.

* Workers are highly motivated to seek constant improvement upon that which already exists. Although high standards are currently being met, there exist even higher standards to achieve.
* Companies focus on group effort, which involves the combining of talents and sharing knowledge, problem-solving skills, ideas and the achievement of a common goal.
* Work itself takes precedence over leisure. It is not unusual for a Japanese employee to work 14-hour days.
* Employees tend to remain with one company throughout the course of their career span. This allows the opportunity for them to hone their skills and abilities at a constant rate while offering numerous benefits to the company.

These benefits manifest themselves in employee loyalty, low turnover costs and fulfilment of company goals.

1. **How can computers aid in development, analysis and Forecasting?**

Computers have tremendously improved the way businesses operate in their respective industries. Technology has advanced so remarkably that those who are not using computers in their business are at a major disadvantage against their competitors. In particular, computers can aid development, analysis and forecasting through the following ways according to computer hope.com article (Nov 2018).

* Tracking of Everything. Computers allow the application of different types of software that can help businesses keep track of their files, documents, schedules and deadlines. Computers also allow businesses to organize all of their information in a very accessible manner. The ability to store large amounts of data on a computer is convenient and inexpensive, and saves space. A computer's ability to allow a company to organize its files efficiently leads to better time management and productivity.
* Do More With Less. Computers have made staff and companies more self-sufficient by allowing them to do tasks that previously had to be outsourced. For example, a company can now use office software to create their own training material. Desktop publishing software can be used to create marketing materials. Online tax and accounting programs allow companies to prepare their own taxes. This allows the dominant operations of a company to remain in-house and empowers the company to become more independent and less susceptible to errors committed by outside parties.
* Automate and Save Money. Emerging technology makes new tools and services more affordable and allows companies to save on their staff payroll and office equipment. Because computers allow work to be done faster and more efficiently, it is possible for a company to hire fewer staff. In addition, with networked and relatively inexpensive computers, companies can store data more easily, saving on the cost of outside file storage, and can avoid having to purchase as many copiers, fax machines, typewriters, and other such items that were used before computers became popular.
* Correspondingly, potentially profitable businesses can be started with a smaller overhead cost. Email capabilities decrease postage costs; software applications reduce the need for large accounting departments, while videoconferencing reduces the need for travel. All resources saved will trickle down to the consumers, who are then provided with much more affordable products and service.
* Do It Better, Do It Faster. Computers help speed up other business operations. The collecting of consumer feedback, ordering of raw materials, and inspection of products is made quicker with computers, allowing companies to operate much faster and to produce better quality results.
* Cheaper Research and Development.R&D, or research and development, costs will also decrease with the help of computers. Scientific research can now be done using the Internet and computer software applications designed to develop and produce new products and services. For example, instead of a company having to do in-person focus groups on a potential new product or to determine their target market, the company can conduct a widespread online survey for a far lower cost.
* In addition, new models of a product can be created online using virtual pictures and drawings instead of having to be hand-drawn. These interactive models created using software programs can help bring the product and its features to life for a far lower cost than creating an actual physical model of the given product.
* Sell around the Clock. Computers can help generate higher sales and profits for businesses via a company website. Many businesses now operate online and around the clock to allow customers from around the world to shop for their products and services.
* Computational Finance. Computational finance is an interdisciplinary process that incorporates elements of mathematical science, economic theory, statistics, and computer simulation and modeling. The applications for computational finance are varied, but they typically focus on investment planning and risk management. Using available statistical data, computers generate simulations that show the outcomes of investments under various situations and the potential for gains and losses. Using this information, companies develop plans to minimize potential losses and prepare for the different scenarios that may occur.
* Economic Forecasting. Computers are used in the creation of complex forecasting models. As in computational finance, computer simulations and models can be used to predict how markets will change. While no forecast is completely reliable, these forecasts factor a diverse array of variables in a fraction of the time a human could manually crunch the numbers. Current policies and models can also be quickly adapted to changing situations with new predictions available almost instantly and ready for assessment.
* Online Trading and E-Commerce. The emergence of e-commerce and online trading of goods, services and stocks has considerably changed the way we do business. Many transactions, especially those between two businesses as opposed to a business and a consumer, are now performed online, with the exchange of information and digital purchases taking place instantly. This has vastly changed the way stocks are traded, as enormous bulk trades can be made the instant prices change, and exchanges are made based on computer algorithms with preset parameters rather than based on instructions to a human trader.
* Data Presentation. The presentation of statistical and financial data has evolved with the involvement of computers. The mountains of data, which in their raw form constitute a decidedly bland list of numbers and figures, can be visually displayed with charts and graphs. The charts convey both data and relational concepts, making the information easier to understand for anyone involved in analysis. While creating these charts required careful attention to detail for accuracy in the past, modern software automates the process, accelerating the generation of accurate and visually dynamic presentations and charts.
* Weather forecasting. In forecasting, we need to look at a lot of weather variables (temperature, dew point, pressure and wind speed to name a few). We only collect this data from weather observation sites, which can be tens to hundreds of kilometers apart. In order to determine these values at locations between the observation sites we interpolate. You are forecasting you need look at many data and determine what is going on to determine what is going to happen next. If humans did all the interpolating themselves for all the data they would never be able to issue the forecast in the time that is expected. Furthermore, now that we have very complicated values to analyze (vorticity for example) there is no way that a human can calculate the effect of all the various factors in play. A computer has to do it.Computers are also required for using weather radar, and yes to a lesser extent satellite data.

**5. Describe the role of supporting computerized system in book keeping, processing and delivering of orders from customers?**

According to Carmelo Romano article in clever accounting.com (Nov 2013), Computerized Accounting involves making use of computers and accounting software to record, store and analyze financial data. A computerized accounting system brings with it many advantages that are unavailable to analog accounting systems.

* Automation: Since all the calculations are handled by the software, computerized accounting eliminates many of the mundane and time-consuming processes associated with manual accounting. For example, once issued, invoices are processed automatically making accounting less time-consuming.
* Accuracy: This accounting system is designed to be accurate to the minutest detail. Once the data is entered into the system, all the calculations, including additions and subtractions, are done automatically by software.
* Data Access: Using accounting software it becomes much easier for different individuals to access accounting data outside of the office, securely. This is particularly true if an online accounting solution is being used.
* Reliability: Because the calculations are so accurate, the financial statements prepared by computers are highly reliable.
* Scalable: When your company grows, the amount of accounting necessary not only increases but also becomes more complex. With computerized accounting, everything is kept straightforward because sifting through data using software is easier than sifting through a bunch of papers.
* Speed: Using accounting software, the entire process of preparing accounts becomes faster. Furthermore, statements and reports can be generated instantly at the click of a button. Managers do not have to wait for hours, even days, to lay their hands on an important report.
* Security: The latest data can be saved and stored in offsite locations so it is safe from natural and man-made disasters like earthquakes, fires, floods, arson and terrorist attacks. In case of disasters, the system can be quickly restored on other computers. This level of precaution is taken by Clever Accounting.
* Cost-effective: Since using computerized accounting is more efficient than paper-based accounting, than naturally, work will be done faster and time will be saved. When one considers that Clever Accounting, one of the latest online accounting solutions, starts at a low monthly subscription (check out pricing here), then computerized accounting really becomes a no-brainer.
* Visuals: Viewing your accounts using a computer allows you to take advantage of the option to view your data in different formats. You can view data in tables and using different types of charts.

**6. What is flexible manufacturing system? Can use of computers facilitate it and why?**

According to Nitin Patil (Sept 2014), A flexible manufacturing system (FMS) is a method for producing goods that is readily adaptable to changes in the product being manufactured, both in type and quantity. Machines and computerized systems are configured to manufacture different parts and handle varying levels of production.

The use of computer to facilitated flexible manufacturing system is referred to as Computer-aided manufacturing (CAM) which is defined as the use of software to control machine tools and related ones in the manufacturing of work pieces. Computer-aided manufacturing may also refer to the use of a computer to assist in all operations of a manufacturing plant, including planning, management, transportation and storage. Its primary purpose is to create a faster production process and components and tooling with more precise dimensions and material consistency, which in some cases, uses only the required amount of raw material (thus minimizing waste), while simultaneously reducing energy consumption.

**Who computers facilitated flexible manufacturing system.**

The Computer-aided manufacturing system controls manufacturing operations performed by robotic welding machines and other industrial tools. A professional with Process Piping Training oversees how the system moves the raw material to different machines after the completion of each step. Finished products are also moved within the system to complete other manufacturing tasks such as synthesizing, quality control, packaging and final checks.

Some of the major applications of the system are woodturning, metalworking, glass working, spinning and graphical optimization of the entire manufacturing procedure. Production of surfaces and screw threads, or aspheric optical elements made from glass, crystals, and other metals, can also be done through Computer-Aided Manufacturing.

Since Computer-aided manufacturing can manufacture three-dimensional solids using ornamental lathes with great intricacy and detail, its practical applications are nearly endless. The system can construct products like candlestick holders, table legs, bowls, baseball bats, crankshafts and camshafts and it works in this process steps;

* Roughing. This process usually begins with raw stock, known as billet, or a roughcasting which a CNC machine cuts roughly to shape of the final model, ignoring the fine details. In milling, the result often gives the appearance of terraces or steps, because the strategy has taken multiple "steps" down the part as it removes material. This takes the best advantage of the machine's ability by cutting material horizontally. Common strategies are zigzag clearing, offset clearing, plunge roughing, rest-roughing, and trochoidal milling (adaptive clearing). The goal at this stage is to remove the most material in the least time, without much concern for overall dimensional accuracy. When roughing a part, a small amount of extra material is purposely left behind to be removed in subsequent finishing operation(s).
* Semi-finishing. This process begins with a roughed part that unevenly approximates the model and cuts to within a fixed offset distance from the model. The semi-finishing pass must leave a small amount of material (called the scallop) so the tool can cut accurately, but not so little that the tool and material deflect away from the cutting surfaces. Common strategies are raster passes, waterline passes, constant step-over passes, pencil milling.
* Finishing. Finishing involves many light passes across the material in fine steps to produce the finished part. When finishing a part, the steps between passes is minimal to prevent tool deflection and material spring back. In order to reduce the lateral tool load, tool engagement is reduced, while feed rates and spindle speeds are generally increased in order to maintain a target surface speed (SFM). A light chip load at high feed and RPM is often referred to as High Speed Machining (HSM), and can provide quick machining times with high quality results. The result of these lighter passes is a highly accurate part, with a uniformly high surface finish. In addition to modifying speeds and feeds, machinists will often have finishing specific end mills, which never used as roughing end mills. This is done to protect the end mill from developing chips and flaws in the cutting surface, which would leave streaks and blemishes on the final part.
* Contour milling. In milling applications on hardware with four or more axes, a separate finishing process called contouring can be performed. Instead of stepping down in fine-grained increments to approximate a surface, the work piece is rotated to make the cutting surfaces of the tool tangent to the ideal part features. This produces an excellent surface finish with high dimensional accuracy. This process is commonly used to machine complex organic shapes such as turbine and impeller blades, which due to their complex curves and overlapping geometry, are impossible to machine with only three axis machines.

**Why computers should be used to facilitate flexible manufacturing system is due to the following benefits:**

* Product can be manufactured with accuracy. The use of computer in manufacturing helps products to be produced with accuracy since there are minimal human errors that will be encounter in the production process. Computers once set will work as per the set time and speed hence producing an accurate number of products require d
* The quality of all products is consistent. The quality of product is consisted is manufacturing is facilitated by use of computers. This is because computers allows once set will pick the same quantity of raw materials and processes it the same as others. Than when humans are used who sometimes get tired and compromise quality.
* Productions is much cheaper: The use of computer-facilitated manufacturing is cost effective for manufacturers than using manual labor because computer aided manufacturing can produce more products at a cheaper cost than human beings.
* Product design can be modified easily: products can be modified easily when computers are used in the manufacturing products. This s because it is just are matter of resetting the computer system and the whole system modified the products are per set requirement of the factory
* A large number of items can be manufactured without any break. Computer facilitated manufacturing works as per the set number of hours. If computer systems are set to continue manufacturing for one hours, it will work continuously with stopping until the time elapse.
* It requires less number of persons for labor. Computer facilitated manufacturing does not require many people in the process on one person can control the whole manufacturing system
* Computer Aided Manufacturing makes it easier for professionals with Engineering Training to measure a plant’s output and production as a whole as well as to optimize the assembly process.
* Computer Aided Manufacturing systems can maximize utilization of a full range of production equipment, such as high speed, 5-axis turning machine, and electrical discharge machines, and can help to implement advanced productivity tools like simulation and optimization to leverage specific professional skills.

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