

DIPLOMA IN PROCUREMENT SUPPLY CHAIN MANAGEMENT

Assignment iv

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| Name | Daniel Manut Gornhom |
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**ASSIGNMENTS**

1. What is Value chain analysis and what its main elements?
2. What are the seven variables which production personnel‘s should zero in?
3. 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?
4. How can computers aid in development, analysis and Forecasting?
5. Describe the role of supporting computerized system in book keeping, processing and delivering of orders from customers?
6. What is flexible manufacturing system? Can use of computers facilitate it and why?
7. What is Value chain analysis and what its main elements?

**Answers:**

Value chain also known as Porter’s Value Chain Analysis is a business management concept that was developed by Michael Porter in his book Competitive Advantage (1985), 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 organization and transact freely and willingly. Value chain analysis is the conceptual notion of value-added in the form of a value. The Porter’s Value Chain Analysis consists of several activities, namely primary activities and support activities. Primary activities have an immediate effect on the production, maintenance, sales and support of the products or services to be supplied. These activities consist of the following elements:

**Primary Activities**

* **Inbound logistics** – These are all the processes related to receiving, storing, and distributing inputs internally. Your supplier relationships are a key factor in creating value here.
* **Operations** – These are the transformation activities that change inputs into outputs that are sold to customers. Here, your operational systems create value.
* **Outbound logistics** – These activities deliver your product or service to your customer. These are things like collection, storage, and distribution systems, and they may be internal or external to your organization.
* **Marketing and sales** – These are the processes you use to persuade clients to purchase from you instead of your competitors. The benefits you offer, and how well you communicate them, are sources of value here.
* **Service** – These are the activities related to maintaining the value of your product or service to your customers, once it's been purchased.

**Support Activities**

These activities support the primary functions above. In our diagram, the dotted lines show that each support, or secondary, activity can play a role in each primary activity. For example, procurement supports operations with certain activities, but it also supports marketing and sales with other activities.

* **Procurement (purchasing)** – This is what the organization does to get the resources it needs to operate. This includes finding vendors and negotiating best prices.
* **Human resource management** – This is how well a company recruits, hires, trains, motivates, rewards, and retains its workers. People are a significant source of value, so businesses can create a clear advantage with good HR practices.
* **Technological development** – These activities relate to managing and processing information, as well as protecting a company's knowledge base. Minimizing information technology costs, staying current with technological advances, and maintaining technical excellence are sources of value creation.
* **Infrastructure** – These are a company's support systems, and the functions that allow it to maintain daily operations. Accounting, legal, administrative, and general management are examples of necessary infrastructure that businesses can use to their advantage.

Companies use these primary and support activities as building blocks to create a valuable product or service.

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

**Answers:**

Production is the manufacturing and distribution of goods. A system is set of variables so related that change in any one of the will induce, or induced by a change in at least one of the others John L Burbidge 1984

The Seven factors of production are as follow

* **Materials**
* **Money**
* **Machines**
* **Manpower**
* **Management**
* **Information**
* **Time**

**Principles of production**

To produce goods and services which can be sold, and generate revenue and profits, a firm must purchase or hire scarce inputs, which are its factors of production. These factors can be fixed or variable.

**Fixed factor inputs:**

Fixed factors are those that do not change as output is increased or decreased, and typically include premises such as its offices and factories, and capital equipment such as machinery and computer systems.

**Variable factor inputs:** Variable factors are those that do change with output, which means more are employed when production increases, and less when production decreases. Typical variable factors include labor, energy, and raw materials directly used in production.

**Time periods for the firm:**

The fundamental principles of production relate closely to the time periods in question, of which there are four:

* **The very short run:** A firm is said to be in its very short run when the only way to increase output is by using up existing stocks of inputs.
* **The short run**: A firm is said to be in its short run when it can increase its output by using more variable factors, such as by hiring more workers, but not by increasing its fixed factors. In the short run firms do not use extra fixed factors, such moving to new premises, to increase output. Therefore, in the short run at least one factor of production is fixed.
* **The long run:** A firm enters its long run when it increases its scale of operations. Increasing scale means that no factor of production is fixed, and all are variable. Typically, this means that a firm expands by building or renting larger premises, purchasing or leasing new machinery and employing more workers.
* **The very long run:** A whole industry enters the very long run when there is a significant change in the use of technology. For example, the widespread use of the internet to book holidays has drastically altered how the holiday industry is structured.

Economic analysis tends to focus only on the short and long run, and largely ignores the very short and very long run.

**Time periods for a market:** A whole market can also be considered in terms of the short and long run.

**The industry short run:** An industry is in its short run when its capacity is fixed.

This usually means that the number of firms in the industry is fixed, with no new firms entering or leaving the market.

**The long run:** This exists when there is an increase, or decrease, in the capacity of the industry to produce, and this usually means that the number of firms in a given market increases or decreases.

**The law of diminishing returns**

The law of diminishing marginal returns comes into play whenever a firm tries to increase output by applying additional variable inputs to a fixed factor. Production requires the combination of both fixed and variable factors to create an output. Economic theory predicts that if firms increase the number of variable factors they use, such as labor, while keeping one factor fixed, such as machinery, the extra output or returns from each additional, marginal unit of the variable factor must eventually diminish.

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?

**Answers:**

Just in time management system (JIT) is a Japan grown management philosophy, which has been applied in practice since the early 1970s. It has been widely implemented in both supply and manufacturing industries as a survival strategy against global market competition with remarkable success. JIT as a management philosophy, rather than another production technique. It is a collection of concepts and techniques for improving productivity. Monden Y. (1993) defines JIT as producing the necessary items, in the necessary quantity at the necessary time.” Here I would add the necessary quality to have a complete definition. The primary objective of JIT is to eliminate waste which Toyota President, Shoichiro Toyoda has referred to as anything other than the minimum amount of equipment, materials, parts, space, and worker’s time, which are essential to add value to the product.” In effect JIT attempts to minimize ordering costs and inventory holding costs and at the same time produce high quality and variety of products to meet consumer taste and demand with minimum delay possible. The West with its own home-grown traditional philosophy of mass production characterized with narrowly skilled professionals to design products, semi-skilled and unskilled workers to tender expensive, single-purpose machines, build- up safety inventory to avoid stock outs and the use of Economic Order Quantity (EOQ) concept, it has been rapidly adapting JIT in many of her industries. This global adaptation, as it inevitably spreads beyond the auto industry, will change everything in almost every industry, choice of customers, the nature of work, the fortune of companies, and, ultimately the fate of nations.

The fundamental concepts to JIT production system are:

* **Elimination of waste**: Production of only the minimum necessary units in the smallest possible quantities (lot sizes) at the latest possible time.
* **Employee participation**: Employees need to be trained as to their role in this operational philosophy to gain cooperation, and acceptance.
* **Integrated systems**: Successful implementation depends on integration of manufacturing, quality, materials and supply systems with the Human Resource system.

Using a JIT system, the following benefits can be obtained:

* Inventory reduction (raw, work-in-progress, finished products
* Increase inventory turn overs
* Lead time reduction
* Quality improvement
* Reduction in working capital and cash flow improvement
* Better labor and equipment utilization
* Increase in worker motivation
* Team work increase
* Reduction of batch sizes
* Higher productivity
* Improved customer service

However, the implementation of a JIT system is not an easy venture. It is indeed a task that cannot be undertaken lightly. It is expensive and difficulty in terms of management and effort, and both in terms of the initial implementation and in terms of continuing effort required to run the system over time. It raises a lot of issues and difficulties especially in small and medium companies. Because of limitations these companies face, which include limited staffing, and material resources, reduced bargaining power with customers, suppliers and financial institutions they can hardly implement all JIT components with ease.

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

**Answers:**

Computers are now a days often used in making complicated investment decisions. As we add more branches to the decision tree, we reduce our ability to analyses problems quickly. However, the rapid development of sophisticated computer equipment has increased the usefulness of computer-based analysis of complex investment decisions. One main reason for the use of computers in economic analysis and forecasting is the Computer-Based Forecasting Ihezuo, 2016: p.214 two major advantages of modern computers are incredibly high speed and great accuracy with which they can do calculations. Hence, any forecasting method can be programmed to run on a computer for this high speed and great accuracy gains. Even the most calculation-intensive methods can be run on microcomputer within a few minutes. widespread availability of in expense, convenient microcomputers.

* **Computers Streamline Operations:**

In today’s highly competitive business world, firms strive to increase productivity and slash costs. In fact, a growing number of companies are instituting austerity programmed to cut layers of corporate management, especially on the international side.

* **Computers help Companies Manage Globalized Businesses:**

As part of their drive to be competitive many companies now turn each of their component businesses as world-wide organizations and plan their manufacturing and sourcing strategies on a global basis. To manage their far-flung operations effec­tively, firms increasingly turn to computers

**Computer in economic Analysis:**

One main reason for the use of computers in economic analysis and forecasting is the widespread availability of in expense, convenient microcomputers. The personal computer (PC) has already become a fixture in financial departments the world over. People are drawn by what PCs have to offer. For a small investment of time and effort one can now, perform various financial analyses more easily and quickly. The result is increased productivity s one financial executive of a large multinational noted, we receive data from over 50 markets. Without computers we couldn’t possibly coordinate that volume of data quickly and efficiently.”

**Forecasting:**

In the present age of uncertainty and information revolution managerial focus has shifted to improving the decision-making process in business and government. The key point in decision making is accurate forecasts. In marketing, for instance, forecasts of market size and market characteristics must be reliable.

A company producing and selling refrigerators, T.Vs., etc., must make accurate forecasts of both regional market demand and types of customers. Based on this forecast, decisions re­garding advertising and other sales promotion ef­forts are taken.

In production management also, there is need for forecasting. Product demand and prod­uct mix, production scheduling, inventory holding, labor scheduling, equipment purchases, plant capacity planning, maintenance, are all based on such forecasts.

In finance and accounting, forecasting is of strategic importance in cash flows, debt collection, capital expenditure rates, working capital management etc. Even the personnel department is required to make manpower planning which is nothing other than forecast for different types of hu­man resources required in business now and in the futur**e.**

**Computers and Forecasting:**

The commercial computers in the 1950s were very large, complicated, slow and expensive. More­over, they had minimum storage capacity. In the 1960s substantial improvement on it was made. The powerful microcomputers of today run faster, are comparatively cheap and contain more RAM mem­ory. It is likely that there will be further improve­ment in speed memory and capacity of computers. It also seems that cost and size of the computers will also be reduced in the future. Even the most calculation intensive methods can be run on a micro-computer within a few minutes.

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

**Answers:**

Bookkeeping is the recording of financial transactions and is part of the process of accounting in business. Chisholm, Hugh, ed. (1911).

Transactions include purchases, sales, receipts, and payments by an individual person or an organization/corporation. There are several standard methods of bookkeeping, including the single entry and double entry bookkeeping systems. While these may be viewed as real bookkeeping, any process for recording financial transactions is a bookkeeping process. Bookkeeping is the work of a bookkeeper (or book-keeper), who records the day-to-day financial transactions of a business. They usually write the daybooks (which contain records of sales, purchases, receipts, and payments), and document each financial transaction, whether cash or credit, into the correct daybook that is, petty cash book, supplier’s ledger, customer ledger, and the general ledger. Thereafter, an accountant can create financial reports from the information recorded by the bookkeeper. Bookkeeping refers mainly to the record keeping aspects of financial accounting, and involves preparing source documents for all transactions, operations, and other events of a business.

Computerized data processing

Without human intervention, a machine which is more powerful, capable and complex in comparison to the bookkeeping machine is used for data processing in a computer.

**A computer’s functions are as follows**:

* Inputting and storing data.
* Arithmetical calculation of data.
* Comparing units of the data to find smaller or bigger data.
* Storing and rearranging data.
* Printing statements from data stored on the computer.
* Computers vary in size and speed with which they process data. The data are retained within magnetic tape or magnetic disc.

For inputting data into the computer, we use a terminal where there lies a keyboard which looks like a typewriter keyboard, and there is also a monitor like TV screen, besides, data may also be entered with previously prepared rules of magnetic tape, magnetic disc and in other ways.

For example, another means of entry uses a laser light that reads a barcode. **Programmed:**  A computer programmer is a language or instruction of a computer which is inserted into the computer earlier. COBOL, Basic, RPG, and FORTRAN are the widely used language.

The instructions specifying each operation a computer is to perform are entered into the computer before the data processed. A program may contain only a few or several thousand detailed instructions.

For example, the following list shows the steps that are to be programmed to have a computer process customers’ orders for merchandise.

For the first order of customer for merchandise purchase, the quantity ordered for purchase is compared with the quantity available in the store as shown by inventory data stored in the computer.

**If the quantity ordered is not available**; A backorder is prepared to inform the customer that enough stocks are not available but will be shipped as soon as new supply is available.

The next item of customer’s order is considered. If the stock in hand is greater than the quantities ordered.

The ordered amount is deducted from the stock.

Necessary instructions are given for the shipment of goods.

After delivery of ordered goods, the remaining stock is compared with a re-order point for the item.

If the quantity remaining is greater than the re-order point;

Next item on the customer’s order is considered.

If the quantity remaining is less than the re-order point;

Amount to be purchased is computed and documents for the purchase are prepared.

Next item on customers order is considered.

Besides, a programmer for processing customers’ orders would have instructions for preparing invoices, recording sales and updating customers’ accounts.

Designing the programmer

The computer can find out the bigger number with the help of its set programmer comparing two numbers.

This capacity helps computer in processing data one way or another depending on the result of the comparison.

It is to be noted that, this ability to compare number is essential for the computer to follow instructions such as those for processing customers’ orders.

The programmer is to design a programmer first to help computer in processing data correctly.

In designing the programmer, the programmer in advance determines the alternative sets of calculations or processing steps to be made.

Then the programmer devises the appropriate comparison that identifies the circumstances under which each particular set of processing steps is performed.

Finally, the programmer writes specific instructions telling the computer how to process data.

A computer can follow through the programmer’s maze of decisions and alternative instructions rapidly and accurately.

However, if the computer faces an exception not anticipated in the programmer, it becomes helpless, either give the wrong information, or it stops.

The ability to store a programmer and data and to sort out correct decisions and alternative distinguishes a computer from an electronic book-keeping machine.

There are some electronic books keeping machines which can do addition, deduction, multiplication or division at the speed of the computer.

But their operating rates are comparatively slow as because they depend on a person to push their functions keys to tell them what to do.

**Operation**

The computer operates in one of the two modes – batch processing or online processing. In the batch mode, the programmer and data are inputted to the computer and processed.

After that, these are removed from the computer before another batch is begun. Then the programmer for a new job and new set data are entered, and the job is processed.

Batch processing may result in processing of customers’ order daily, preparation of weekly payroll, preparation of financial statement monthly and the processing of other jobs on a periodic basis.

Batch processing is used when an immediate processing or immediate computer response is not required. Data processing under batch mode is less expensive in comparison to line mode.

In online processing, the programmer is put on the computer along with the required data.

When new data are entered, these are instantly processed by the computer.

For example, in some departmental stores, the cash registers are connected directly into the store-computer. In addition to cash sales, the registers are used as follows in recording charge sales.

After the customer selects merchandise for purchase, the salesman uses the customer’s plastic credit card to print the customer’s name on a blank sales ticket.

The sales ticket is then placed in the form’s printer of the cash register, and the sale is recorded. The register prints all relevant information on the sales ticket and totals it.

To finalize the sale, controls within the register require that the salesperson depresses the proper registry keys to record the customer’s account number and for posting the sales to the customer’s account.

The salesperson does not post the account. Rather the data entered with the cash registers key causes the store computer to update the customer’s accounts. The computer also produces the customer’s month-end statement. Online operations are followed in supermarkets, banks, airlines and in some big factories.

Online operations reduce human labor, create more accurate records and provide management with better and more up-to-date reports.

Moreover, when there are enough transactions, they do the work at less cost per transaction.

**Time-saving**

People have been able to win the time with the help of a computer. Multifarious works can be done simultaneously through a computer with a quick result.

The customer inputting information using the input-output device can have results within few seconds.

Besides, using modem internet system a person can inquire about any matter or any information anywhere of the world giving a nominal charge where necessary.

At present, the physicians are also benefited from using the computer system.

**Microcomputer**

A microcomputer is a modem and developed form of computer. These types of computers are cheap and widely used.

Small business concerns or individuals are benefited using this type of computers in their day to day work. Modem computer system has almost eradicated the traditional system of recording accounts pen and ink.

the method to be followed depends upon the condition of the business. General ledger reflects the progress or degrees of a business concern.

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

**Answers:**

A flexible manufacturing system (FMS) is an integrated group of processing CNC machines and material-handling equipment under computer control for the automatic processing of palletized parts. FMSs represent a compromise between the high flexibility of versatile job shops and the high production rate of a dedicated mass production system. It can produce limited number of preplanned part families and utilizes similarities between members of a parts family based on group technology. FMSs are most suited for the mid-variety, mid-volume production range, exploiting the benefits of the Economy of Scope while achieving the efficiencies of the Economy of Scale (ElMaraghy 2006). Moreover, flexible manufacturing can respond quickly to increasing product variants and decreasing quantities per variant (ElMaraghy et al. 2013)

**Parts are typically grouped into families by one of three means**: Visual inspection where parts with visually-similar features are grouped together Parts classification and coding where part similarities, in terms of design attributes and manufacturing attributes are identified and subsequently coded Production flow analysis where parts with similarities are identified by having similar production routings.

**Cellular manufacturing:** is an application of group technology in which similar machines or processes have been aggregated into cells, each of which is dedicated to the production of a part, product family, or limited group of part families. It is often arranged so that it can cater for all the requirements of the composite part that is, the hypothetical part that includes all possible design and manufacturing attributes of the part family being processed.

**Flexibility**

The term flexibility has many associations here, in terms of the FMS; these are:

The capability to identify and distinguish among the different incoming part or product styles processed by the system, the capability of performing a quick changeover of operating instructions, the capability of performing a quick changeover of physical set-up.

**Computer Control System**

To operate, the FMS uses a distributed computer system that is interfaced with all workstations in the system, as well as with the material handling system and other hardware components. It consists of a central computer and a series of micro-computers that control individual machines in the FMS. The central computer co-ordinates the activities of the components to achieve smooth operational control of the system.

* **Workstation control**: fully automated FMSs use some form of workstation control at each station, often in the form of CNC control
* **Distribution of control instructions to workstations:** a central computer is required to handle the processing occurring at disparate workstations; this involves the dissemination of part programmed to individual workstations, based upon an overall schedule held by the central computer
* **Production control**: management of the mix and rate at which various parts are launched into the system is important; alongside data input of several essential metrics, such as: daily desired production rates, number of raw work parts available, work-in-progress etc.
* **Traffic control:** management of the primary handling system is essential so that parts arrive at the right location at the right time and in the right condition
* **Shuttle control:** management of the secondary handling system is also important, to ensure the correct delivery of the work part to the station’s work head
* **Workpiece monitoring**: the computer must monitor the status of each cart or pallet in the primary and secondary handling systems, to ensure that we know the location of every element in the system
* **Tool control:** this is concerned with managing tool location (keeping track of the different tools used at different workstations, which can be a determinant on where a part can be processed), and tool life (keeping track on how much usage the tool has gone through, to determine when it should be replaced)
* **Performance monitoring and reporting**: the computer must collect data on the various operations ongoing in the FMS and present performance findings based on this
* **Diagnostics**: the computer must be able to diagnose, to a high degree of accuracy, where a problem may be occurring in the FMS.

Benefits of successful FMS applications include: increased machine utilization; fewer machines required; reduction in the amount of factory floor space required greater responsiveness to change; reduced inventory requirements; lower manufacturing lead times; reduced direct labor requirements and higher labor productivity; and opportunities for unattended production

**References:**

1. Porter, M. E. (1985). Competitive advantage: creating and sustaining superior performance. Nova Science Publishers.
2. Gaffney M. Land as a distinctive factor of production in the Journal of Land and Taxation. London. Shephard-Walwyn (Publishers) Ltd. Nicolaus Tideman. 2014;3-43.
3. Yasuhiro Monden, 1993, Toyota Production System: an integrated approach to Just-In Time. Second edition, Industrial Engineering and Management Press, Institute of Industrial Engineers, Norcross, Georgia.
4. P. A. B. Hughes and N. B. Morgan Journal of the Royal Statistical Society. Series D (The Statistician)

Vol. 17, No. 3 (1967), pp. 279-299

1. Chisholm, Hugh, ed. (1911). "Book-Keeping. Encyclopedia Britannica. 4 (11th ed.). Cambridge University Press. p. 225

1. Azab A, ElMaraghy HA (2007) Mathematical modeling for reconfigurable process planning. CIRP Ann 56(1):467–472