**AFRICAN CENTER FOR PROJECT DEVELOPMENT INSTITUTE ACPM NAIROBI KENYA**

**MODULE 3 ASSIGNMENTS**

**THIS ASSIGNMENT IS SUBMITTED TO THE DEPARTMENT OF PROCUREMENT FOR THE PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE COURSE OF POST GRADUATE DIPLOMA IN PROCUREMENT AND SUPPLY CHAIN MANAGEMENT.**

**SUBMITTED BY. TATA STEPHEN**

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**SUBMITTED TO. HEAD OF PROCUREMENT DEPARTMENT**

**QUESTIONS FOR THE ASSIGNMENT.**

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

* **Approach: Value Chain** is the full range of activities that including design, production, marketing and distribution that businesses conduct to bring a product or service from conception to delivery. For companies that produce goods, the value chain starts with the raw materials used to make their products, and consists of everything added before the product is sold to consumers.
* **Value Chain Analysis is the functions** help organisations to gain better understanding of key capabilities and identify areas for improvement. It can help them to understand how competitors create value; and help organisations to decide whether to extend or outsource particular activities.

**Above are is the scope of value chain and value chain analysis but below are the main elements of value both primary and support activities.**

* **Inbound logistics** are the receiving, storing and distributing of raw materials used in the production process.
* **Operations** is the stage at which the raw materials are turned into the final product.
* **Outbound logistics**are the distribution of the final product to consumers.
* **Marketing and sales** involve advertising, promotions, sales-force organization, distribution channels, pricing and managing the final product to ensure it is targeted to the appropriate consumer groups.
* **Service** refers to the activities needed to maintain the product's performance after it has been produced, including installation, training, maintenance, repair, warranty and after-sale services.
* **Procurement** is how the raw materials for the product are obtained.
* **Technology development** can be used in the research and development stage, in how new products are developed and designed, and in process automation.
* **Human resource management** includes the activities involved in hiring and retaining the proper employees to help design, build and market the product
* **Firm infrastructure** refers to an organization's structure and its management, planning, accounting, finance and quality control mechanisms.

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

* **Approach defined variables:** these arefactors are those that do change with output, which means more are employed when production increases, and less when production decreases. Typical variable factors include labour, energy, and raw materials directly used in production.
* **Productions personnel.** These are people who are involved in the daily activities concerning productions they ensure marketing, planning management and many other activities related to productions in the organization.
* **Natural Resources (Land and Raw Materials)** – The ingredients for the pizza are raw materials. These include the flour, yeast, and water for the dough, the tomatoes, herbs, and water for the sauce, the cheese, and the toppings. If the pizza place uses a wood-burning oven, we would include the wood as a raw material. If the establishment heats the oven with natural gas, we would count this as a raw material. Do not forget electricity for lights. If, instead of pizza, we were looking at an agricultural product, like wheat, we would include the land the farmer used for crops here.
* **Labor** – When we talk about production, labor means human effort, both physical and mental. The pizza iolo was the primary example of labor here. He or she needs to be strong enough to roll out the dough and to insert and retrieve the pizza from the oven, but he or she also needs to know **how** to make the pizza, how long it cooks in the oven and a myriad of other aspects of pizza making. The business may also have one or more people to work the counter, take orders, and receive payment.
* **Capital** – When economists uses the term capital, they do not mean financial capital (money); rather, they mean physical capital, the machines, equipment, and buildings that one uses to produce the product. In the case of pizza, the capital includes the peel, the oven, the building, and any other necessary equipment (for example, tables and chairs).
* **Technology** – Technology refers to the process or processes for producing the product. How does the pizza iolo combine ingredients to make pizza? How hot should the oven be? How long should the pizza cook? What is the best oven to use? Gas or wood burning? Should the restaurant make its own dough, sauce, cheese, toppings, or should it buy them?
* **Entrepreneurship** – Production involves many decisions and much knowledge, even for something as simple as pizza. Who makes those decisions? Ultimately, it is the entrepreneur; the person who creates the business, whose idea it is to combine the inputs to produce the outputs.
* **Research-**this involves market research where by the production personnel listens to consumer’s suggestion about their products and suit the production according to the consumers desires, and introducing new methods of productions thus inducing new technology to improve production.
* **Product design-**this involves commonly introducing new products in the market and improving on the quality of the ready exiting products after survey or research has been carried out by the production personnel. For instant introduction of new TECHNO phones design in likeness of IPHONES base on the market demand.

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?**

* **Approach Just in Time management system.** Just in time inventory, also known as JIT inventory is the reduced amount of [inventory](https://www.accountingtools.com/articles/2017/5/13/inventory) owned by a business after it installs a [just-in-time manufacturing system](https://www.accountingtools.com/articles/2017/5/9/just-in-time-manufacturing). This type of system is called a "pull" system. The intent of a JIT system is to ensure that the components and sub-assemblies used to create [finished goods](https://www.accountingtools.com/articles/2017/9/20/finished-goods) are delivered to the production area exactly on time
* **Is JIT utopia**: There are a multitude of improvements related to JIT inventory, particularly in relation to reduced cash requirements and the ease with which manufacturing problems can be uncovered as shown below.
* **Working capital**. JIT inventory is designed to be exceedingly low, so the investment in working capital is minimized.
* **Obsolete inventory.** Since inventory levels are so low, there is little risk of having obsolete inventory.
* **Defects.** With so little inventory on hand, defective inventory items are easier to identify and correct, resulting in lower scrap costs.
* **Process time**. A thoroughly implemented JIT system should shorten the amount of time required to manufacture products, which may decrease the quoted lead times given to customers placing orders.
* **Engineering change orders**. It is much easier to implement [engineering change orders](https://www.accountingtools.com/articles/2017/5/6/engineering-change-order) to existing products, because there are few existing stocks of raw materials to draw down before you can implement changes to a product.
* **Reduction in the order to payment timeline**; cash, as they say is king in business. Many businesses will suffer with cash flow problems, as they will often have to purchase large amounts of raw materials prior to manufacturing and subsequent payment by the customer. Often this gap is many months. Through implementing JIT, you are able to considerably reduce that time period.
* **Reduction in Inventory costs**; one of the main aims with any JIT implementation is to improve stock turns and the amount of stock being held. Personal experience has seen reductions of more than 90% stock in some industries. Along with the reduction in the stock come many other associated benefits.
* **Reduction in space required**; by removing large amounts of stock from the system and moving processes closer together, we will often see a significant reduction in the amount of floor space being used. Results from 100’s of projects run within companies in the UK through the Manufacturing Advisory Service saw average reductions of 33% for simple 5-day implementation projects.
* **Reduction in handling equipment and other costs**; if you do not have to move large batches there is less need for complex machinery to move them and all of the associated labor and training.
* **Lead time reductions**; one of the most significantly impacted areas is that of the time it takes for products to flow through the process. Instead of weeks or months, most JIT implementations result in lead times of hours or a few days.
* **Reduced planning complexity**; the use of simple pull systems such as Kanban, even with your suppliers, can significantly reduce the need for any form of complex planning. With many implementations, the only planning is the final shipping process.
* **Improved Quality**; the removal of large batch manufacturing and reduction in handling often results in significant quality improvements; often in the region of 25% or more.
* **Productivity increases**; to achieve JIT there are many hurdles that must be overcome with regards to how the process will flow. These will often result in productivity improvements of 25% upwards.
* **Problems are highlighted quicker**; often this is cited as being a negative aspect of JIT in that any problems will often have an immediate impact on your whole production process. However, this is the perfect way to ensure that problems are highlighted and solved immediately when they occur.
* **Employee empowerment**; one requirement of JIT as with most other aspects of Lean manufacturing is that employees are heavily involved in the design and application of your system.
* **Can it be made to work:** it commonly works on theinventory reduction as shown in the following below means?
* **Reduced production runs**. Fast equipment setup times make it economical to create very short production runs, which reduces the investment in finished goods inventory.
* **Production cells**. Employees walk individual parts through the processing steps in a work cell, thereby reducing [scrap](https://www.accountingtools.com/articles/2017/5/16/scrap) levels. Doing so also eliminates the [work-in-process](https://www.accountingtools.com/articles/2017/5/13/work-in-process-inventory) queues that typically build up in front of a more specialized workstation.
* **Compressed operations**. Production cells are arranged close together, so there is less work-in-process inventory being moved between cells.
* Delivery quantities. Deliveries are made with the smallest possible quantities, possibly more than once a day, which nearly eliminates [raw material inventories](https://www.accountingtools.com/articles/2017/5/13/raw-materials-inventory).
* **Certification**. Supplier quality is certified in advance, so their deliveries can be sent straight to the production area, rather than piling up in the receiving area to await inspection.
* **Local sourcing**. When suppliers are located quite close to a company's production facility, the shortened distances make it much more likely that deliveries will be made on time, which reduces the need for [safety stock](https://www.accountingtools.com/articles/2017/5/16/safety-stock).
* **Reliable Equipment and Machines**; if your machinery is always breaking down or giving you quality problems then it will frequently manifest in big issues with any JIT flow. The implementation of Total Productive Maintenance is required to ensure that you can rely on your equipment and to minimize the impact that any failures have on your processes.
* **Well-designed work cells**; poor layout, unclear flow, and a host of other issues can all be cleared up by the implementation of 5S within your production. This simple and very easy to implement lean tool will make a significant improvement in your efficiencies all by itself.
* **Quality Improvements**; an empowered workforce that is tasked with tackling their own quality problems with all of the support that they need is another vital part of any lean and JIT implementation. Setting up kaizen or quality improvement teams and using quality tools to identify and solve problems is vital.
* **Standardized Operations**; only if you know how each operation is going to be performed can you be sure what the reliable outcome will be. Defining standard ways of working for all operations will help to ensure that your processes are reliable and predictable.
* **Pull Production**; Just in time does not push raw materials in at the front end to create inventory (push production), it seeks to pull production through the process according to customer demand. It achieves this by setting up “supermarkets” between different processes from which products are taken or by the use of Kanbans which are signals (flags) to tell the previous process what needs to be made.
* **Single piece Flow**; the ideal situation is one in which you will produce a single product as ordered by the customer. This for some industries is not immediately possible but should always be your end goal. To achieve this you will need to work on reducing batch sizes significantly through the use of Single Minute Exchange of Die (SMED) which seeks to significantly reduce the time taken for any setup. It will also often require the use of smaller dedicated machines and processes rather than all singing all dancing mega machines.
* **Flow at the beat of the customer**; the demand of your customer is often referred to as your Takt time. You need to ensure that your cells and processes are organized, balanced and planned to achieve the pull of the customer. This is achieved through Heijunker and Yamazumi charts
* **Philosophic approach in terms of Batch size**: Just in Time (JIT), as the name suggests, is a management philosophy that calls for the production of what the customer wants, when they want it, in the quantities requested, where they want it, without it being delayed in inventory.

So instead of building large stocks of what you think the customer might want you only make exactly what the customer actually asks for when they ask for it. This allows you to concentrate your resources on only fulfilling what you are going to be paid for rather than building for stock.

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

* 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 analyse problems quickly. However, the rapid development of sophisticated computer equipment has increased the usefulness of computer-based analysis of complex investment decisions. And the below is how computers aid development in analysis and forecasting.
* **Severally computer**-based forecasting is deployed virtually in all areas of economic decision-making, statistics, accounting, management, marketing, etc. This researcher discussed few of the application areas here.
* **Population:** population forecasting are achieved through computer-based forecast. Head count popularly called CENSUS done in developing nations are not yearly but periodically for instance once in 10years in Nigeria is continued as projection based on population growth rate factor. Same is where census is not done but registering of birth and death. Computer-based forecast is used to know the growth factor and number. These exercises would have been helpless if there is no computer-based forecast.
* **Budget Appropriation**: annual national expected income and spending of government to the society is a forecast based on expected growth and development rate expected to achieve in the coming fiscal year. This estimate projects into the future expected income to make and expected expenditure. 100% full deployment of forecast can help governance.
* **Developmental Projects**: distribution of developmental projects can use computer-based forecast to remove biases and arbitrariness in its modus operandi when distributing projects. The Computer-Based forecast model and or database should be able to know places that have received government projects and areas that remains to receive so that not some localities receive and others denied.
* **Decision Support System [DSS]:** there is support for using Decision Support Systems (DSS) with the following issues addressed: techniques within the DSS, corporation needs and limitations, the forecast cost effectiveness, and the appropriate software system.
* **Distribution of Amenities**: similar to projects computer-based forecasting is a strong tool that government that want to deploy e-governance use in distributing, knowing where to distribute and know where to focus government services and amenities. A typical DSS or a database system can be developed for this purpose.
* **Sales**: Sales forecasting is an integral part of marketing DSS. The DSS contains tools to help the forecaster prepare better forecasts; tools are data, records of previous forecasting, and techniques. Sales forecast application can also be on standalone.
* **Marketing**: Computer-based forecasts assist marketing managers improve decision-making.
* **Organizational Design:** here, forecasting should not be regarded as a self-contained activity, but should be integrated within the planning context of which it is a part. In large matrix organization, accurate forecast can be a major success to OD.
* **Planning:** this researcher believes that forecasting and planning functions should be combined largely. Involvement of the forecasters in planning enables them to select criteria for evaluating forecasting methods that are meaningful within the planning context.
* **Operators’ Expenses [Imprest] & DSS**: authors Rubinstein & Liddle (1997) stressed that restaurant operators must go beyond the typical spreadsheet software that only allows for tallying of operator expenses and does not include the technology of a DSS.
* **Production Requirements**: Many software packages are available to restaurant operators that incorporate inventory management, purchasing and sales data, this assist restaurant operators in forecasting sales and production requirements.
* **Supply Chain Management:** one means of an automated system in supply chain management in the restaurant industry is electronic data interchange (EDI). EDI is the computer-to computer exchange of business transactions between companies. EDI is seen as a means to facilitate sales forecasting efforts by providing information that would pertain to a channel member's demand for the products and/or services offered by the supply channel member. In turn, the supply channel member, upon receiving this information, would respond with an update to production and/or distribution schedules in order to meet this demand.
* **Customers Services [via POS]:** the POS [another system to manage sales forecasting in restaurants] system operates on the property level, with the capacity to be interfaced with regional and corporate systems to provide efficiency in the collection and transfer of sales data, inventory management, recipe maintenance, payroll, and many other functions. Hand-held server terminals, which are actually POS systems, allow servers to accurately enter orders that are linked to restaurant databases containing inventory and sales information. Nowadays, this technology in hardware and software is increasing customer service while decreasing inaccuracies in restaurant forecasting

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

* **Computer based transaction processing:**  
  Computer based transaction processing systems are often considered the bread and Butter MIS application. No matter how nervous upper management in a medium to large organization is about spending in the information system area it knows that it cannot pull thee plug on its TPS and Survive. Under this, we shall refer to role of information technology. And transaction processing which transaction refers to an exchange of goods are services for money. The earliest transaction processing systems were manual systems. Clerk would records transactions in journal or on numbered, multi part forms.
* **Pay roll.** The transaction processing subsystems used to produce paychecks for employees are called payroll-processing systems. These systems also must produce data for tax purposes. Additionally, payroll-processing system must keep track of such items as Social Security payments, union dues, and group insurance deductions.
* **Order entry.** The order entry system is transaction-processing subsystem that processes customer orders. Orders may come from variety of sources –perhaps by mail, phone, and fax-from customers who are ordering on demand basis.
* **Inventory.** The quantity of product that a merchandising has available to sell at any given time is called inventory. An inventory system monitors the quantity of each product available for sale and helps ensure that proper stock levels are maintained.
* **Invoicing.** The invoicing in the transaction processing subsystem that creates invoices and some times, packing slips. A packing slip shows little more that what products are contained in shipment; prices are either hidden or missing.
* **Shipping.** The shipping system is conceptually simple. Sealed, address packages of goods are received from inventory, often with shipping instructions. Technology has affected the shipping operation in several ways. Computer and communication systems make it much easier to succeed in the overnight package delivery business.
* **Account receivable**In many firms, customers pay by credit card or have goods charged to their accounts. The account receivable system in the transaction processing system that manages customer purchase records, payments, and account balances.
* **Purchasing.** Many companies use a central purchasing department to procure the goods they need. The advantages of centralized purchasing department are cost control, vender control, and taking advantage of discount realized by quantity buying. The major advantage is inconvenience to the other departments in the organization for whom the goods are being purchased.
* **Receiving.** The function of a receiving system in a receiving department is to receive, inspect, and accept or reject goods that vendor’s ship. As goods are received, the shipping cartoons are opened, the contents are checked against the information on the purchase order, the price of shipment is verified, and goods are inspected for possible damage. If the goods are satisfactory, they are typically routed either to inventory or to the department initiating the purchase request.
* **Accounts payable.** Most firms have accounts with their major suppliers (Vendors). The accounts Payable (A/P)-or simple “payables”-System is the transaction processing subsystem that handles payments to suppliers. It keeps track of invoices from suppliers, determines the optimum time to pay invoices, produces checks to pay invoices, and performs cash management activities (thereby ensuring that cash is always available when bills must be paid). Shows a data flow representation of the payables systems. A payable is a liability that is created as soon as goods (or services) are received from vendors. The invoices and statements are validated against the actual receipt of goods found in the receipt file and, if all of the information is in order, the payable is created on the books. At this point, as many as 30, 60, or 90 days may elapse before the bill is actually paid, depending on the terms of the vendor. As soon as the payment is made and recorded, the payable is closed out (Thomas, 1993).
* **General ledger.** The general ledger (G/L) system integrates transaction data from the other major transaction processing subsystems-payroll, accounts receivable, accounts payable, and so on. Besides insuring that the records of the firm balance, the general ledger system is used for budget planning, responsibility reporting, cost allocation and profitability accounting.
* **Error level.** With manual systems, an uncomfortable level of error often exists. Frequently, look up to the long prices, and prices incorrectly on invoices, or produce garbled journal entries or source documents. Sickness, worry, moodiness, and other inherently human variables can also contribute to high error rates in manual systems.
* **Temporary or permanent loss of data**Source documents and file folders are easily lost are misplaced. This often results in lost customer payments and delayed purchase or payments.
* **Labor intensity.** Manual systems are labor intensive and, therefore, costly. Data from a single transaction often have to be transcribed several times, and many types of low volatility data have to be rerecorded by clerks every time a new transaction takes place (Tromthy and Krasnewch, 1994).
* **Poor level of service.** The level of service support in manual systems is often inferior. Customers like to know immediately if goods are not in stock, when goods not in stock will be arriving, when they can expect an order to arrive, what their current status is regarding payments and so on. This level of information support is difficult to achieve with a manual system. (Wilkinson, 1986).
* **Poor response.** Virtually everything takes longer to do with a manual system. When orders are taken, the order entry department might have to contact receivable department for credit check before a can be validated. Today, many computerized order-entry operations are connected to a centralized database and when a customer telephones, credit status can be verified immediately (Mehler, 1992).

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

* **Definition**. Flexibility is an attribute that allows a mixed model manufacturing system to cope up with a certain level of variations in part or product style, without having any interruption in production due to changeovers between models. Flexible manufacturing system can work according to Kinds of Operation, Number of Machines and Level of Flexibility as explained below.
* **Processing operation.** Such operation transforms a work material from one state to another moving towards the final desired part or product. It adds value by changing the geometry, properties or appearance of the starting materials.
* **Assembly operation**. It involves joining of two or more component to create a new entity which is called an assembly/subassembly. Permanent joining processes include welding, brazing, soldering, adhesive bonding, rivets, press fitting, and expansion fits.
* **Single machine cell (SMC)**. It consist of a fully automated machine capable of unattended operations for a time period longer than one machine cycle. It is capable of processing different part styles, responding to changes in production schedule, and accepting new part introductions. In this case processing is sequential not simultaneous.
* **Flexible manufacturing cell (FMC).** It consists of two or three processing workstation and a part handling system. The part handling system is connected to a load/unload station. It is capable of simultaneous production of different parts.
* **A Flexible Manufacturing System (FMS).** It has four or more processing work stations (typically CNC machining centers or turning centers) connected mechanically by a common part handling system and automatically by a distributed computer system. It also includes non-processing workstations that support production but do not directly participate in it. E.g., part / pallet washing stations coordinate measuring machines.
* **Dedicated FMS.** It is designed to produce a particular variety of part styles. The product design is considered fixed. So, the system can be designed with a certain amount of process specialization to make the operation more efficient.
* **Random order FMS.** It is able to handle the substantial variations in part configurations. To accommodate these variations, a random order FMS must be more flexible than the dedicated FMS. A random order FMS is capable of processing parts that have a higher degree of complexity. Thus, to deal with these kinds of complexity, sophisticated computer control system is used for this FMS

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