

Project Management for Managers
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Lecture - 59
Procurement Management – Part I

Good morning friends, I welcome you all in this session as you are aware in previous session we were discussing about quality management one of the important knowledge areas of project management, and we have seen several tools which can be applied to maintain quality of a product or a project. We have seen tools like let us say histogram, we have seen run chart, we have seen control chart and we have seen what is poka yoke, we have seen phase safe mode and other things also we have seen.

Now, before starting the next area which is procurement management, let me tell you a couple of things about failure mode and effect analysis, and other important quality tool is called failure mode effect analysis FMEA. Now there are 2 3 points you should keep in mind whenever you go for failure mode effect analysis, we need to find out what are different possibilities of failure of a machine are of equipment. So, try to find out what are the possible failure modes of a machine, what is the probability of occurrence of failure and how severe that failure is. It is possible that a machine is failing, but its effect is not must severe.

So, you need to know three things; occurrence of the failure how severe that failure is and how easily you can detect that failure. So, if you know all these three things then you can calculate something called risk priority number. So, if there is a machine first find out what are the possible causes of failure, let us a failure due to let us a power supply right it is a failure due to operators mistake right then if you know that how many times machine failed due to power supply you know just calculate the probability, if not probability then you can just assign a number between 1 to 10 right. Similarly once you know that they d detect what is the probability of that failure, then what are the effects of that failure right and how severe those effects are right.

So, you just calculate risk priority number for each failure and then assign some persons to look after those failures. So, in this way you can do failure mode effect analysis by calculating risk priority number and by assigning a person who would be looking after

that particular failure right. So, this failure mode effect analysis, apart from this there is something called process capability. Process capability is something which you need to know is the ability of the process to keep central tendency and dispersion at their required levels. When I say central tendency it means I am talking about mean mode and median.

So, it is possible it is good to maintain that the process strikes to central tendency, and when I say it is dispersion you can measure it through either range or standard deviation or variance right. So, it is good to use variance is a method for measuring dispersion. So, and there are different types of methods available for example, if you want to measure central tendency of the process, then there is something called x bar chart. You can use x bar chart for measuring variability you can use r chart, if not r chart then in some situations you can use s chart it is called standard deviation chart. If not standard deviation then you can directly use various chart right.

So, there are different types of charts available through which you can control quality of a projector or a product right. So, now, let us move on to the next important knowledge area, which is procurement management. Due to shortage of time we will not be able to cover three knowledge areas namely project integration management, scope management and communication management. Apart from these three areas we have covered all remaining seven areas right. So, let us look at procurement management, one of the very important functions one of the very important knowledge areas. Because in a project you have got 100 of vendors and you would be requiring thousands of materials from those vendors. And if you do not do this activity properly then I do not think you would be able to complete project in time within budget, and having a required performance level right.

So, procurement management is an important area it is also known as sourcing. In fact, sourcing would be the appropriate word for this because sourcing includes several things right, and it includes for example, purchasing, it includes and let us a vendor selection it includes marketing research for a raw materials and components and so on right. So, procurement management or sourcing is to be done properly in a project. Even if you look at supply chains these days then and there are 6 important drivers namely you can have let us a first is information.

Then you got transportation then we got wear housing, we got inventory right your got pricing and you got sourcing right. So, procurement management what an important topic and before I start lecturing on this particular topic, the first thing is we should be known to all of you is that you should look at these 5 hours. So, you should always look at right quality of the raw material component are assembly right. So, right quality, right quantity, right place are right you should get the material that right place right it should be available to your organization at right time and you should select material from right source right. So, these are 5 hours of purchasing right. Apart from these 5 bars you should also look at some selective inventory control tools and there are several tools will not look at all those tools, but will look at couple of important tools.

So, you can classify your raw materials and components into different categories and these categories are the first one is abc analysis. As I told you in one of the sessions that there are products in which the 80 percent cost is for 20 percent of the components right. In fact, your seen in pareto analysis also. So, in abc classification also in a product you will have certain items which would be 20 percent in quantity, but there their cost would be 80 percent right.

So, there is something called abc analysis, we will see an example on a abc analysis then you can have you know items as seasonal and of seasonal items in fact, if you look at these days almost most of the businesses are seasonal right.

And. In fact, of you for example, let us a in summers we have got business of let us a cold drinks and ice creams and so on right in winters you got some other businesses as and so on. So, most of the businesses are seasonal these days right. So, you need to procure your raw materials in according to seasonal and off seasonal right and there is something called ved analysis; you can have v stands for vital e is for essential and d is for desirable is called vital essential and desirable.

If you look at a pen a ball point pen, when the refill is the vital component because we will it writes. So, vital component is valid essential is the place from where you hold it right in a pen it is essential, and let us a cape is desirable is not it.

So, you can classify the items which you are going to purchase for your product is vital essential and desirable items right. You can I have one more classification is called golf, you can have government source, ordinary source, local source are foreign source right,

government, local and foreign right. So, it again it depends if you are able to get material from government source having right quality price time, then you can go for the right otherwise look for some other source right.

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SELECTIVE INVENTORY CONTROL
classifying items into different categories.
ABC analysis (Annual consumption value)
SOS
VED
GOLF
FSN
SDE (Depending on lead time- Scars (Abroad), Difficult, Easy)

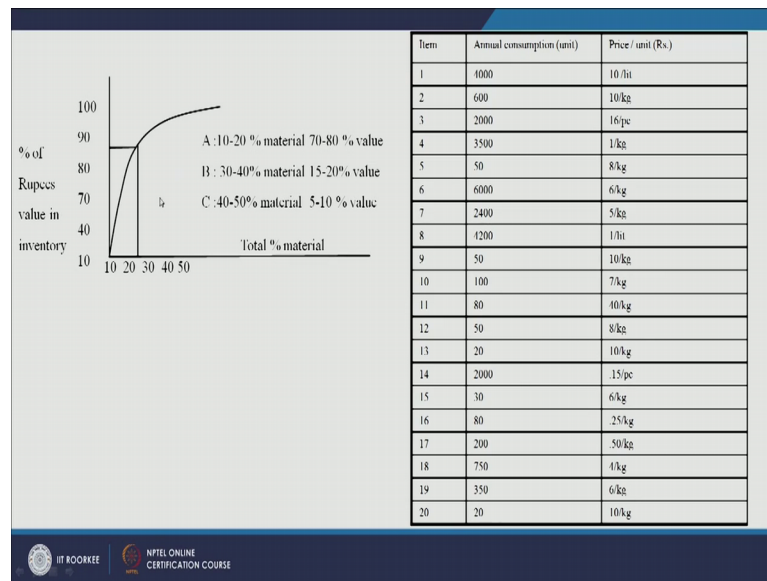
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So, you can a government source local source and foreign source of getting raw materials and components right. Then you got fast moving slow moving and non moving items right and then there is something called SDE analysis, there are some scared scares items then you, but difficult items and there are some easy to purchase items right.

So, let us say if you are getting raw materials from abroad it is its quite an because the item is scares in India. So, that is why you are getting it from abroad right. So, you can have this kind of different categories right. So, we will look at abc analysis, I will take one example and then we will try to find out which components are of a b and c type right. So, we do analysis on the basis of annual consumption value right. So, let us take this example you are using let say 20 items in your organization, and this is annual consumption, but before this let me tell you the classification of a b and c right. So, a items are those items which are having as far as volume is concerned 10 to 20 percent of the items, but and their value is around 70 to 80 percent right b category of items are 30 to 40 percentage and their values 15 to 20 percent right c category of items 40 to 50, but their value is 5 to 10 percent.

So, there are 10 to 20 percent items having value 70 to 80 percent they have would be termed as a category items right. So, if you look at this curve. So, on y axis you have got percentage of rupees value in inventory and you have got percentage of material here right. So, if you look at this, this is the curve and if you look at area from here to here this is contributing is the percentage of rupees value in monetary right, and then you can have a different categories from this curve right and we will have it in next slide.

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So, let us look at this example. So, you have got 20 items, the annual consumption is for first item is 4000 right second items 600 units right similarly for nineteenth item 350 units and for twentieth items it is 20 units. So, this these are requirements of these 20 items their prices are also given. So, this is 10 rupees per liter. So, it is total value would be what it is 40,000 right.

Similarly, if you look at this item you need only 20 units and the price is rupees 20 per kg. So, it would be 200 rupees right. So, just convert all these two columns into their rupee value right and this is the annual consumption right.

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Item	Annual consumption (unit)	Price / unit (Rs.)	Annual consumption (Rs)	Rank	Cum	%
1	4000	10 /lit	40000	40000	40000	27
2	600	10/kg	6000	36000	76000	51
3	2000	16/pc	32000	32000	108000	73
4	3500	1/kg	3500	12000	120000	
5	50	8/kg	400	6000		
6	6000	6/kg	36000	4200		
7	2400	5/kg	12000	3500		
8	4200	1/lit	4200	3200		
9	50	10/kg	500	3000		
10	100	7/kg	700	2100		
11	80	40/kg	3200	700		
12	50	8/kg	400	500		
13	20	10/kg	200	400		
14	2000	15/pc	300	400		
15	30	6/kg	180	300		
16	80	25/kg	20	200		
17	200	50/kg	100	200		
18	750	4/kg	3000	100		
19	350	6/kg	2100	80		
20	20	10/kg	200	20	147000	

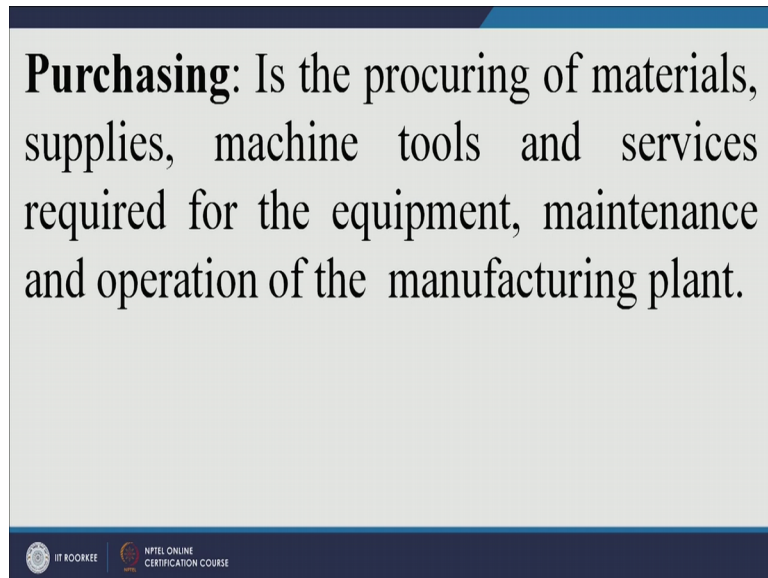
You just multiply these two columns you will get annual consumption is not it. So, as I said 4000 into 10 40000 20 into 10 200 right. Now after this you just rank all this items according to their consumption value. So, the highest is for this which is 40000 the next one is 36000 right. It is for item number 6 right then the next one is 32000 right for item number 3. So, you just arrange them according to their values right the annual consumption after this just take the cumulative of this, this particular column. So, for two thousand this is 40, 000 plus 36000 76000 plus 32000 and so on right. You just keep on doing this is not it. Now if you look at the total value you just add this particular column you will get a total value here right is not it. and when you go for in (Refer Time: 16:11) this is your total value is not it. In fact, this is some of this cumulative value and in fact, this is the cumulative value for item number 20 right.

So, you just keep adding all this things right. So, this comes out to be 1,47,000 right. Now if you look at this 40, 000 is 27 percent of this right then this is this value is 51 percent this value is 73 percent. So, we will say that this a item number 1 2 and 3. In fact, this 40, 000 is for item number one right then 36,000 is for item number what 6 right. So, 1 6 and this is item number 3.

So, item number 1 6 and 3 these three contribute to 73 percent of the total value of the total consumption right. So, we will say these three items are a class item and they are out of 20 items how many items are this. So, they are approximately 10 to 10 percent right. So, as we have said that those items which are contributing as far as you know their value is 70 to 80 percent and their value is between 10 to 20 percent. So, these

items are a category items, the last couple of items would be c category items and in between you will have b class of item. So, this is an example of a b c analysis right.

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Now, let us look at what is purchasing. So, it is a process of procuring materials supplies machine tools and services required for equipment and then maintenance and operations of the manufacturing plant. So, you need to ensure that you should have sufficient inventories to run the plant right. now a days this function is taking more and more importance, the reason because in a you will find that the cost of goods and services is 50 to 70 percent, it depends on product product right. So, 50 to 70 percent is the cost of raw materials in components. So, that is why this purchasing functions is very important.

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Growing importance of purchasing: earlier it was activity of production management.

-Higher cost of goods and services – 50 to 70% raw material, component, services in total cost.

-Escalating cost of stock outs

-Higher present day cost of capital : fixed and working capital – 60:40, around 80% of working capital is locked up in inventory of RM,WIP, FG.

Interest rates are very high.



So, if you can save on purchasing then you can increase your profit right. The other reason why this function is gaining importance is escalating cost of stock outs. Now a days what is happening if you do not provide finished product to the customer in time, then they will switch over to some other product because there are several competitors of that particular product which you are selling right.

So, your responsibility is to ensure that you make product available. If you do not make product available in market then it would be a loss for you and it is difficult to get customers back. So, ensure that there is no stock out of finished products because that is the product which customers would be buying right. So, to ensure that there is no stock out taking place of finished product, you should ensure that the other inventories for example, work in process inventory and raw materials, their stock should also be there in planned right because if there is a stock out then you it would cost you a lot right, then higher present days higher present day cost of capital. So, you have got fixed and working capital depends it is ratio is 60 to 40 percent right again it depends on organization to organization and product to product. And most of the times around 60 to 80 percent working capital is locked up in inventory in the form of either raw material or work in process or finished goods right. It is always suggested to keep inventory as slow as possible. You see inventory management is quite an interesting area, in inventory management you have to you know optimize conflicting objectives and this conflicting objectives is are first is you do not want to you know invest money in inventory right because it is a kind of dead capital right it is a dead money.

So, try it you do not want to you know keep money in the form of inventories, at the same time you also want to keep inventory because you want to fulfill customers requirements in time right. So, they are two conflicting objectives. So, from one side you need to keep inventory on the other side you do not want to keep inventory. So, what to do? You should have a balanced approach right. So, this is quite an interesting area inventory management.

Purchasing is not merely (Refer Time: 22:11) of mind it includes several activities market research. Purchasing department will have to look for what is happening in the market, what are different new raw materials available who are different vendors available, what are different pricing right what are different exchange rates.

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Purchasing is not mere act of buying: it includes

- market research,
- vendor rating,
- standardisation and verity reduction,
- codification,
- indent control,
- pre-purchasing value analysis,
- price negotiation,
- inventory control,
- surplus disposal,
- purchase budget,
- import substitution,
- purchase system design.

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So, you need to the purchasing department has to be you know updated in terms of all those things right vendor rating. You need to ensure that your vendors are rated properly and they are audited properly right. Because if something goes wrong with the final product, then it is it is your brand which is at stake it is not the vendor because nobody knows vendors, it is your organization which is whose reputation is at stake right. So, you need to ensure that you are properly taking care of your vendors. Then standardization and variety reduction codification indent coding and there are several other you know functions of purchasing department right

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- Changing nature of purchase: it is a **techno-commercial** activity
- Professionalization** of material function: ABC analysis, economic lot size, learning curve, line of balance, etc.
- Changing **concept** of buyer-seller relationship : “ a supplier is dependent on buyer and he can made to perform his part of contract the way buyer desires” is old concept.

Now, a days purchasing is becoming quite a professional activity, it is not like that you just make a phone call to vendor and he will supply material right it is not like that. Since we are living in globalised era, you need to at in a profession manner and it is good to go for there is something called techno commercial activity and it is more of a techno commercial activity these days right. So, when I say techno commercial activity means what whenever you go for purchasing of any product then if you are going for let say an global tender are if you are going for at national level, you know tendering process are let say let say close tendering right it depends on what kind of you know materials you are looking for what is the value of those items and so on right.

So, look at it is good to call vendors for discussions right. So, you can have discussions on technical aspects first right. You can look at let say what are the specifications of products whether it is a chemically specifications mechanically specifications you know physically specifications and so on right. So, you should talk about all this things right and then if you are done with technical aspects and go for commercial aspects right and now a days whenever you go for. So, you should also look at green supply in aspects or green aspects of purchasing. Rather than going for just let say what is the cost of raw material, what is the delivery period or what is the payment mode, rather than going for these three things it is good to go for how good that raw material is for the environment right. So, you just look at vendors from environmental perspective.

How his processes are the processes of vendors affecting environment, is vendor using environment friendly materials, is he using environment friendly colors, is the process of

vendor is polluting let say rivers is not it or is vendor polluting air quality is not it. So, you should look at green aspects these days right and then you should look at techno and commercial aspects right.

So, these are couple of things which you should keep in mind now a days whenever you buy material from vendor, it should be winning situation for both of you right. It is not like that you should always suppress your vendors because his win his victory and your victory will at the end of the day will fetch profit from the market right. So, there should be winning situation for supplier and buyer right. So, there are couple of objectives of scientific purchasing procure material at competitive price, maintain continuity in supply right it is not that your vendor has supplied material and he is stopped for some reasons right. So, there is something called now a days people are talking about just in time right. So, just in time you see the concept is you should get raw material and work in process items whenever you required right not too late not too early 8because if you are getting it too early it is a kind of wastage in inventory right too late you will not be able to make finished product and you will not be able to supply in market right.

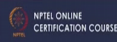
So, should be just in time. So, for that you need to have very few vendors few suppliers who are reliable right. So, just in time is basically it is a (Refer Time: 28:31) technique of reduction of waste. So, it is a waste reduction technique and inventory is a kind of waste it should not be there in plant right. So, and there are certain other wastes right for example, in fact, there are different 7 types of wastages available. So, we will not go into detail, but just in time is a process of reducing waste or those it is a waste minimization technique, and for that you need to have close relationship with few suppliers right. Then ensure production of goods and goods of better quality. In fact, these are couple of promise you should you should keep in mind whenever you are going for purchase purchasing right. Purchasing department has got certain duties to perform, there are some primary duties some secondary duties some tertiary duties and so on right. So, a primary duty is to look for right source right then you should get material in time. So, you should place the order in time, you should follow up the order and you should get things in time right then disposal of surplus obsolete and scrap materials right.

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Functions of purchase department

Primary duties:

- **Receipt**, scrutiny of purchase intend and determination of method of buying.
- **Search** for suppliers
- Acquisition and analysis of suppliers' proposal
- **Selection** of suppliers
- **Follow-up** for timely receipt
- Performance evaluation and **feedback**
- Disposal of **surplus obsolete, and scrap material**

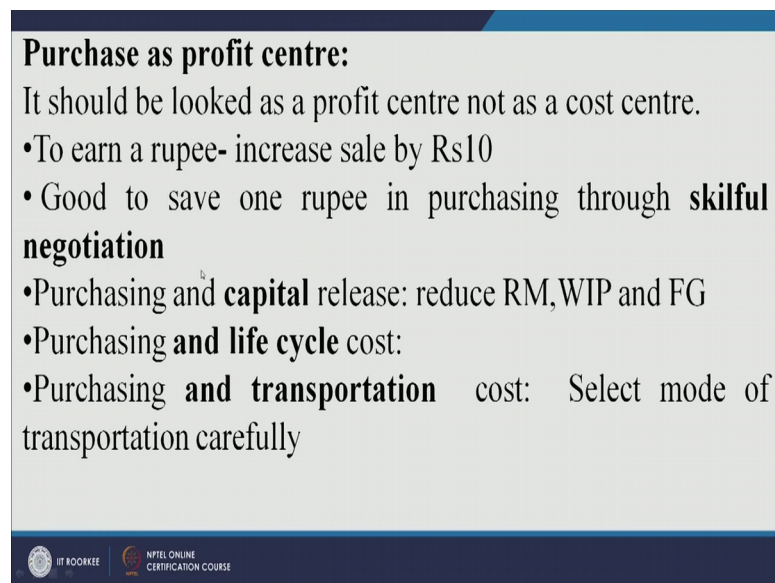


So, these are couple of primary duties of purchase department. There are some other duties for example, (Refer Time: 30:21). So, when an organization should make a product and then it should buy a product right. So, there are several things you should look at right. First a of all do you have capability to make that product, if you want capability, but if total cost is more than the cost of buying from outside then it is good to buy right is not it. Now again it depends on there are again several things you need to keep in mind right because if you buy it from outside if it is cheaper than what your facilities will do right. So, try to make product in house by in such a way, that it cost is less than the cost which you are getting from outside right. So, make or by a decision very important decision, it also depends on what is the urgency right. Let say if you can make a product in house, but it takes time and you do not have time, but you will have to buy right. So, you need to take make or buy decision right. Capital equipment and construction purchase these are again this is one of the secondary duties, purchase research as I said purchase research is a very important, you need to look at you need to carefully monitor the entire market about the prices of raw materials, exchange rates, inflexion, then the payment mode to different vendors and so on right and then you have got traffic and store right these are other optional duties right. In fact, earlier people used to think that purchasing is something we should not be focused because it is an activity which will not result any profit for the organization, it is a function where in you need to always you spend and spend and spend right.

So, but nowadays profit should be; this purchasing should be seen as a profit centre because to increase profit by let say 100 rupees, you need to increase sales and for and

the first be sure putting in increasing sales would be much much more than saving 100 rupees in purchasing. So, you should have some skill full negotiations with the vendors. If you go for school full negotiations, then you can save a lot in purchasing and that is how you can make purchasing as a profit centre purchasing and capital release.

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Purchase as profit centre:
It should be looked as a profit centre not as a cost centre.

- To earn a rupee- increase sale by Rs10
- Good to save one rupee in purchasing through **skilful negotiation**
- Purchasing and **capital** release: reduce RM,WIP and FG
- Purchasing **and life cycle** cost:
- Purchasing **and transportation** cost: Select mode of transportation carefully

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So, these are couple of other points we should keeping mind, purchasing and life cycle cost very important. We should not like look at purchasing just for the time being right you should look at the life cycle cost of the project right. Life cycle cost of the raw material which you are purchasing right because let us if you are purchasing a machine to right. So, if the machine is let us a cheaper today, but it would have a very you know very high repair in maintenance cost right. So, you should look at the entire life cycle of the machinery equipment which are going to purchase right. So, these are couple of points you should look carefully before going for purchasing. So, this let me stop here and will continue this topic in next session also.

Thank you very much.