# Management of Inventory Systems Prof. Pradeep Kumar Ray Department of Industrial and Systems Engineering Indian Institute of Technology, Kharagpur

### Lecture - 45 Basics of Purchasing Management (Contd.)

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Before we close the session on Purchasing Management and the first issue is the selection of the suppliers, then once the supplier is selected, then you go for measuring the performance of the suppliers. So, the supplier performance measurement and evaluation that is an important topic, we are going to discuss. Now the purchasing department performance is also a very important issue.

So, we will highlight some of the important the issues the factors to be considered for purchasing departments, performance measurement; and the purchasing relationship with inventory control systems in specific terms, you must be aware of.

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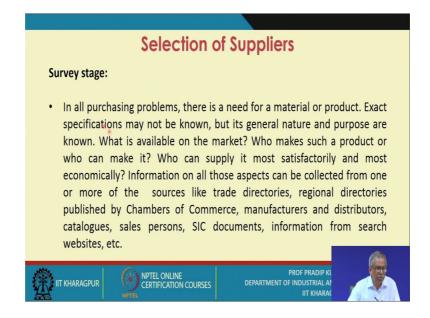


Now, I have already in the in the previous lecture session, I have already highlighted the importance of supplier selection; that means, you go for make or buy decisions, supposing for given item, your decision is buy; that means, you are going to purchase that item from the source of the supply. So, now, so; obviously, you know the next the course of action is the selection of the supplier.

Now, it is an important issue and we select a supplier or a group of suppliers for the given item or the material following certain norms following certain procedures. So, and this the entire the selection of the suppliers usually consists of 4 interrelated stages. First one is the survey stage, the second one is the inquiry stage, third one is the negotiation stage and fourth one is the experience stage.

So, these are the 4 phases and you need to go through all these or you have to say the follow or you have to use certain or you have to carry out activities as required in each of the fourth stages.

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So, let us talk about the survey stage; that means, suppose the item, you are going to purchase these item is to be purchased for the first time. So, you need to first select a group of prospective suppliers or the possible suppliers and then so, in the survey stage, you try to make a list of the possible suppliers.

And out of this list of possible suppliers, then you will be selecting a few suppliers with which you start negotiating or purchase. So, at the survey stage, there is a need a why do you need to the survey in all the purchasing problems, there is a need for a material or a product exact specifications may not be known; that means, suppose it is a new product and you have some specifications, but, but exactness is missing.

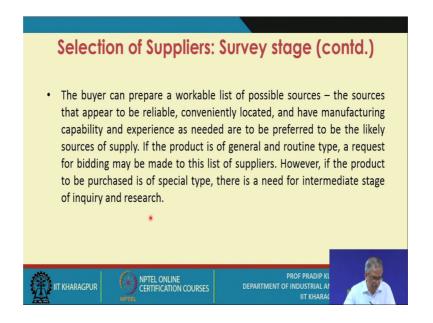
But its general nature and purpose are known what is available on the market, you should explore who are the possible suppliers who make such a product or who can make it. So, also similar products, you may come across or situation where you are specifying the product exact specifications are known, but when you make a survey of the market, you find that that exact the product with that exact specification is not available, but is similar product may be available in the market who make such a product or who can make it who can supply it more satisfactorily and most economically information all those aspects can be collected from one or more of the sources.

So, what do you try to do? This is the first time you are going to purchase it. So, where from you get this basic information? These sources could be the trade directories,

regional directories published by the chambers of commerce manufacturers and distributor's catalogues, sales person's information, you collect from the sales persons because you have been running the purchase department for the long time so; obviously, you are aware of as who are the you are aware of the presence of say the sales persons in your in the department.

So, why do not you interact with them standard industrial classification documents? So, you refer to. So, you will get the list of products; list of products under different categories and who are the suppliers or the registered suppliers against each category of the products. So, SIC documents you refer to an information from search websites ok. So, these are the possible sources of information.

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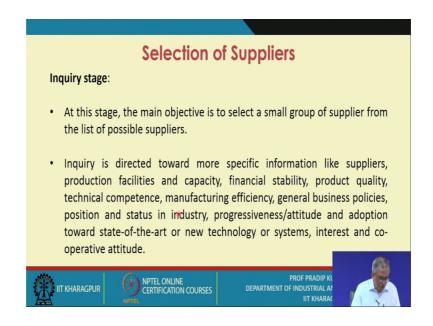


Now, the buyer can prepare a workable list of possible sources workable, there is a point to be noted, the sources that appear to be reliable that is that is why it is workable conveniently located; that is why it is workable and have manufacturing capability.

And experience as needed are to be preferred to be the likely sources of supplying. So, 3 important factors you considered. First one is the reliability, second one is the location and the third one is the manufacturing capability and experience. If the product is of general and routine type, it may be a standard product. A request for bidding may be made to this list of suppliers. So, now, you find that this is a standard component, this is standardized design; however, if the product to be purchased is of special type; is it ok?

Many time, we come across this situation. In fact, there is a need for intermediate stage of inquiry and research, you are getting the information, but this is not a complete information with respect to this specialized product which you are going to say the procure.

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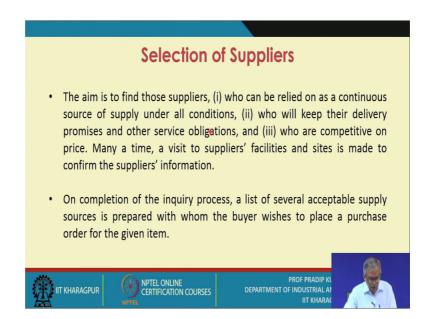


So, you move to the next stage that is called inquiry stage or the research stage. At this stage, the main objective is to select a small group of suppliers from the list of possible suppliers inquiry is directed toward more specific information. Now you become more specific like the suppliers production facilities and capacity. So, this must be known the supplier's production facilities.

And the capacities, financial stability, product quality, technical competence, please note down all these points, manufacturing efficiency, general business policies, position and status in industry progressiveness or attitude and adaption toward state of the art or new technology, whether is a progressive organization or not; that means, the organization is open to adopt say the new technologies or the state of the art technologies and procedures of the systems.

Now, interest and cooperative attitude; so, these are the important factors you consider. So, many a time, you may go for some using some say survey technique to get the details.

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The aim is to find those suppliers who can be relied on as a continuous source of supply under all conditions; that means, what you are trying to do; that means, you you try to create a supplier base and with each supplier in this base, you want to have a long standing relationship who will keep their delivery promises and other service obligations, this is a very important issue.

And who are competitive on price ok, many a time a visit to suppliers facilities and the sites is made to confirm the suppliers information. So, this is just for verification purpose, you make a visit to the possible suppliers plans and you get a firsthand knowledge of what is the actual practice or what is what is the actual strength of the company, we service your purchase requirements on completion of the inquiry process; a the list of several acceptable supply sources is prepared normally this is the case with whom the buyer wishes to place a purchase order for the given item.

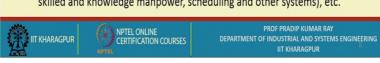
So, if you taken an open approach in always you will find that not only one the source of supply a group of the possible sources of supply, you will you will you will come to know and maybe all are of equal strength or equal competence.

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#### **Selection of Suppliers**

#### **Negotiation and Experience Stage:**

- On completion of inquiry stage, we may come very close to the decision.
  However, the final decision to select the suppliers is made after
  negotiating the details of requirements and terms and conditions face-toface in majority of cases. The basic objective of negotiation is to ascertain
  the best value from the purchase and this value is assessed in terms of
  three specific factors- quality, service, and price.
- There may also be other intangible factors determining the overall values
  of the purchase like level of interest, observation and goodwill, special
  circumstances (like fulfilling interest of smaller enterprise, availability of
  skilled and knowledge manpower, scheduling and other systems), etc.

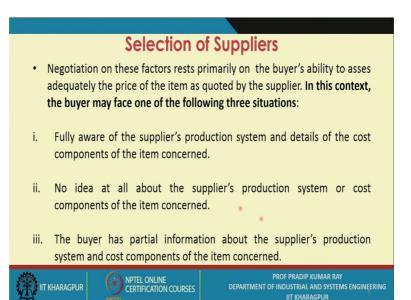


So, now what you do? You go for negotiation with say the possible say the suppliers and while you negotiate, you have you gain some experience. So, that is why it is also referred to as of the negotiation and experience stage on completion of the inquiry stage we may come very close to the decision.

However, the final decision to select the suppliers is made after negotiating the details of requirements and terms and conditions face to face. In majority of the cases, face to face the basic; that means, you need to discuss all these important issues with the supplier, companies, representatives the basic objective of negotiation is to ascertain the best value from the purchase. So, this point is to be noted the best value from the purchase and this value is assessed in terms of 3 specific factors quality service and price.

There may also be other intangible factors determining the overall values of the purchase like level of interest, there is the first factor observation and goodwill special circumstances like fulfilling interest of smaller enterprise like SM is small and medium enterprises, availability of skilled and knowledge manpower, scheduling and other system; that means, these are the special requirements you need to say the fulfill.

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Negotiation on this factor rests primarily on the buyer's ability to asses adequately the price of the item as quoted by the supplier.

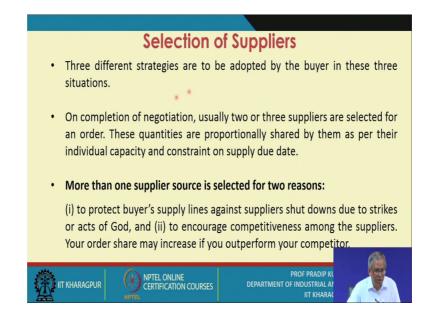
So, that is most important. In fact; that means, you are paying a price, but you know this price the covers which aspects; that means, what are the important aspect covered under this price. So, in this context, the buyer may face one of the following 3 situations while the negotiation is on now as a buyer you you may be fully aware of the suppliers production system and details of the cost components of the item concerned. So, do you negotiate?

So, how do you determine the price or how do you negotiate? The other extreme, you do not as a buyer, you have no idea at all about the suppliers production system or the cost components of the item concerned; is it ok? So, this is a ones very common occurrence as a purchase officer you have you have knowledge in one particular discipline, but this the product comes from a different discipline so; obviously, in most likely you do not have any knowledge about their production systems or the other aspects of the product, but you cannot say that you cannot negotiate.

So, what should be your approach for negotiations? So, that your company has a buyer has a buyers company gets the maximum the benefit out of this the negotiation and in between you also come across the case as far as the negotiation is concerned, the buyer

has partial information about the suppliers production system a production systems and cost components of the item concerned.

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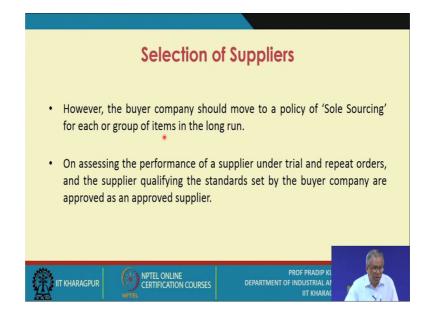
So, 3 different strategies are to be adopted, I am not going to discuss all these different strategies, this is the management the related problems.

But you just make a note that 3 different strategies are to be adopted by the buyer in these 3 situations, but just make a note that the negotiation is a very important component in arriving at a decision on the price of the product on completion of negotiation usually 2 or 3 suppliers are selected for an order, this is a very common occurrence, these quantities are proportionally shared by them as far as per their individual capacity and constraint on supply due date.

So, it may so happen that you have selected 3 companies; companies A, B and C. So, what we may suggest that the company A will be given the 40 percent of 40 percent of the quantity required, company B also 40 percent of the total quantity and the company C may be given say the 20 percent of the total the quantity required more than 1 supplier source is selected for 2 reasons to protect buyer supply lines. Again supplier shutdowns due to strikes or acts of god and the second reason is to encourage competitiveness among the suppliers. So, this is an important issue in today's context your order share may increase.

If you out form your competitor. So, this is the message you are giving to your supplier.

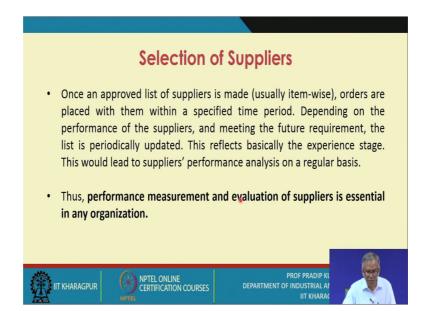
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However the buyer company should move to a policy of sole sourcing. So, this is the present trend sole sourcing for each a group of items in the long run. So, that is your you know, the long term goal that for each and every item or even for the group of items you need to have just one supplier ok. So, that is the sole sourcing. So, you have to go through all the steps and later on, out of the many the suppliers, you select one of them as the only supplier for a given item or for a group of items.

So, this concept is well accepted by many progressive organizations these days on assessing the performance of a supplier under trial and repeat orders and the supplier qualifying the standard said by the buyer company are approved as an approved supplier.

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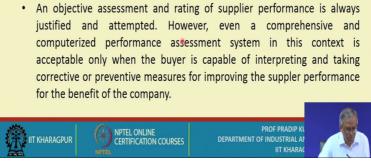
So, this is the thing now; so, once the suppliers are selected; what you try to do? Now you go for ah; that means, orders are given and orders are given initially as a trial orders and then you will find that it that particular suppliers performances usual accepted. So, ultimately the supplier is included in the in the list of approved vendors or approved suppliers.

Now, the performance measurement and evaluation of suppliers is essential at this stage.

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• Test for experience or satisfactory performance by the order is the real test of suppler selection once the order is placed with him or her.



So, what do you try to do that means you go for an objective assessment and rating of supplier performance. So, this is always preferred objective assessment, but; however, this point is to be noted that even a comprehensive and computerized performance assessment systems, in this context is acceptable only when the buyer is capable of interpreting and taking corrective or preventive measures for improving the supplier performance for the benefit of the company.

That means, one point you must not forget that is any the performance the measurement in assessment systems you opt exclusively for one purpose that is the improvement that means if the systems of performance measurement and evaluation for the suppliers is installed the main purpose is how to improve the performance of the supplier.

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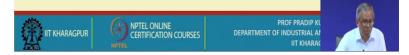


So, the rating system in this context considers 3 important criteria factors. So, what are these factors? The first factor is the quality, the second factor is the service or the delivery and the third one is the price. Now out of these 3 factors, one may be given more importance or weightage for a particular case. So, so, this is very very important; that means, 3 important factors you need to consider, there may be the use of rating scale the point rating for the factors for objective evaluation is it.

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## Measurement and Evaluation of Supplier Performance

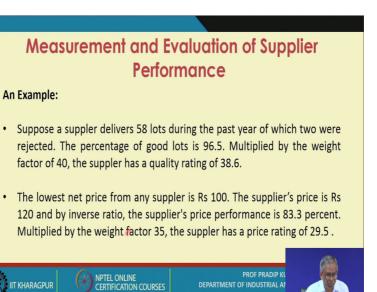
- There may be the use of rating scale (point rating) for the factors for objective evaluation. For example, quality may be rated at 40 points, price at 35, and service at 25; out of total points of 100.
- As we develop the performance measurement system, the concerned suppliers are periodically informed about their performance rating. They become aware of the critical areas where they have deficiencies and limitations. It is also equally important to validate the performance measurement system.



So, many a time, we need to consider say the subjective factors also. So, against the subjective factor; obviously, you need to use some rating scale for example, quality may be rated at 40 points; that means, the individual weightages. So, the price at 35; that means, its individual weight is 35 and the service at 25 out of total points of 20; that means, with respect to the item or with respect to the material, the considered for purchase you need to determine these weightages. So, what do you try to do that you the develop your performance rating systems and in course of time when you start collecting data.

So, you must be able to validate the performance measure in systems which you have developed which you have adopted; that means, as soon as you say that you have developed the performance measure system; that means, immediately, it will be assume that it has been validated.

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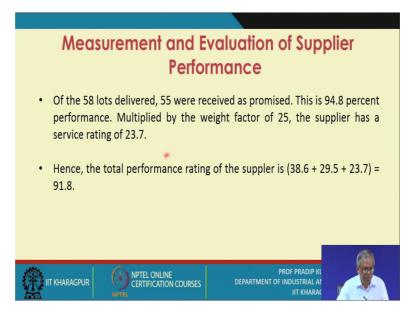


So, this is an example suppose a supplier delivers 58 lots during the past year of which 2 were rejected the percentage of good lots is 96.5 multiplied by the weight factor of 40, I have already mentioned the supplier has a quality rating of 38.6, the lowest net factor is the price the lowest net price from any supplier is rupees 100, the supplier's price is rupees 120.

And by inverse ratio, the supplier's price in performance is 83.3 percent multiplied by the weight factor 35 the supplier has a price rating of 29.5.

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Of the 58 lots delivered, 55 were received as promised, this is 94.8 percent performance multiplied by the weight factor of 25 the supplier has a service rating of 23.7. So, this is a very simple calculations we have made, hence, the total performance rating of the supplier is 38.6 plus 29.5 plus 23.7 that is 91.8.

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So, this is just an example. Now in the typical rating system then; that means, you may call it a comprehensive systems may consider 4 principal factors. So, the factors related to the company the factors related to the service the factors related to the products and the factors related to the salespersons. So, these are the 4 factors to be considered in a comprehensive performance, measurement systems and with weights of each principal factors the specified and they may be varying as both objective and subjective factors are to be included in each principal factor a common rating scale can be used for each factor.

So, this point already you have mentioned. Now, what is this comprehensive system?

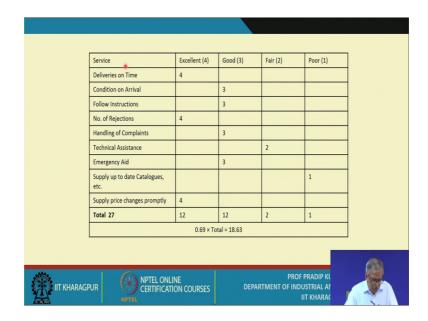
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		]					
	Company:	Date:		Total Rating:			
	Company		Excellent (4)	Good (3)	Fair (2)	Poor (1)	
	Size &/or capaci	ty	4				
	Financial Streng	th		3			
	Operational Profit			3			
	Manufacturing Range		4				
Rese	Research Faciliti	Research Facilities			2		
	Technical Servic	e		3			
	Geographical Lo	cation	4				
	Management		1	3			
	Labour Relation	s		3			
	Trade Relations			3			
	Total 32		12	18	2		
			0.63 × To	tal = 20.16			-
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So, we can follow this particular comprehensive system. So, I suggest you go through all the all the factors like related to the company, you need to consider all these factors; is it ok? One factor could be the labor relations, it means the relationship between the management and the workers and what is the trade relations? That means, the relationship between you as a company with the others in your industry; is it ok? So, that is essentially this relationship determines the trade relationships

So, several factors you need to considered and you have a 4 point scale.

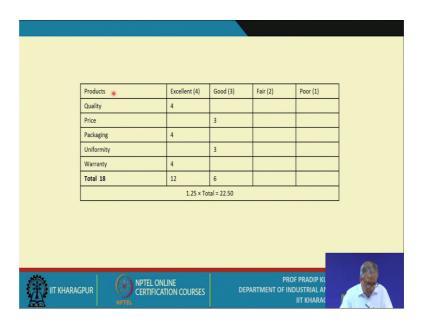
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So, 4 means excellent, a value of 3 means good, a value of 2 means fair and if you get a score of 1, it means poor, it is ok? So, for all the factors, you consider a 4 point scale. Similarly, as well as service is concerned, you need to consider all these factors in general and each factor; what are the relevant factors? In the for the given case, you first identify and you react them in this particular scale poor point scale ok.

So, this is just an example; several values are given.

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So, this is just an example. Now this is the product which you are going to purchase; is it ok? So, related to the product you need to consider all these 5 factors. First one is the quality, second one is the price, third one is the packaging. So, this point is to be noted; fourth one is the uniformity and the last one is the warranty. So, these are the 5 factors to be considered.

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1. Knowledge His company 3	
His products 6 4	
Our industry 3	
Our company 3	
2. Sales Calls	
Properly placed 4	
By appointment 3	
Planned and prepared 3	
Mutually productive 4	

And these are all rated now and that the fourth factor is related to the sales personnel with whom you are interacting; so, sales versus knowledge and the sales calls. So, all these are rated.

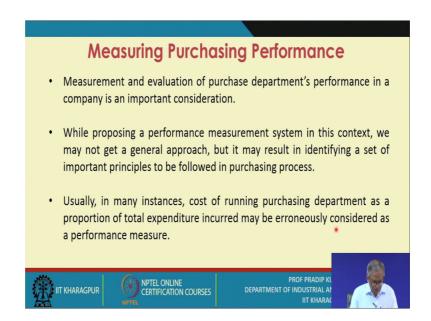
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Sales	Personnel	Excellent (4)	Good (3)	Fair (2)	Poor (1)	
3. Sa	es-service					
	Obtain information		3			
	Furnish quotations promptly	4				
	Follow orders		3			
	Expedite delivery		3			
	Handle complaints		3			
	Total 43	16	27			
	0.48 × Total = 20.64					
	Total Rating = 9	90.16 +18.6	53 + 22.50 ·	+ 20.64 = 8	1.93	

So, ultimately and the sales service also this particular factor or these aspect is also rated with the same the rating scale and ultimately, you get a total rating of this that is 81.93.

So, my suggestion is you go through all these all these factors and you get an idea of a total system for performance measurement and evaluation for the suppliers.

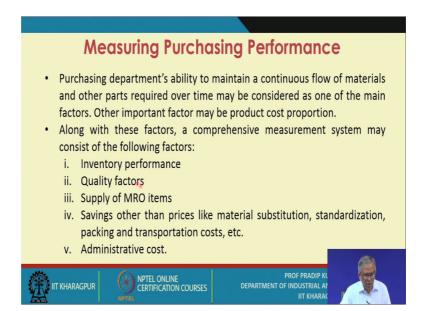
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So, this is a comprehensive systems now the next important issue you should you should know that is how to measure the performance of a purchasing department as such. So, the measurement and evaluation of purchase department performance in a company is an important consideration while proposing performance measurement systems. In this context, we may not get a general approach this is difficult. In fact, you cannot get a general approach.

But it may result in identifying a set of important principles to be followed in purchasing process. So, that is the main advantage if you try to develop a performance measurement systems for the purchasing department. So, many sorts of the important purchasing principles, you should be aware of and you try to apply those principles as a good principles for purchasing. So, there are many factors you need to consider one by one.

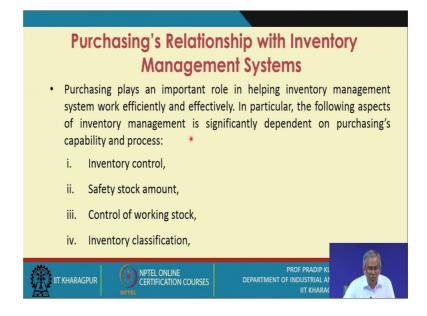
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So, usually you know what is important is that in a comprehensive measurement systems for purchasing department.

So, these are the factors you need to consider; that means, to what extent it helps inventory performance, the quality factors of the products supply of MRO items to what extent, you can maintain this savings, other than prices like material substitution is an important activity of purchase, department, standardization, packing and transportation cost, etcetera and of course, you need to consider the administrative cost.

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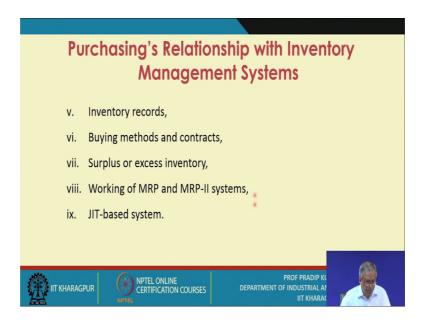


So, what is the purchasing relationship with inventory management system? So, this is the last important issue we are going to highlight in this in this lecture session.

That is the purchasing plays an important role in helping inventory management systems work efficiently and effectively without the support of the purchase department the no inventory management systems can work efficiently and effectively, in particular the following aspects of inventory management is significantly dependent on purchasing capability and process. So, all these important aspects we have already discussed in the topics related directly to inventory management in the past weeks.

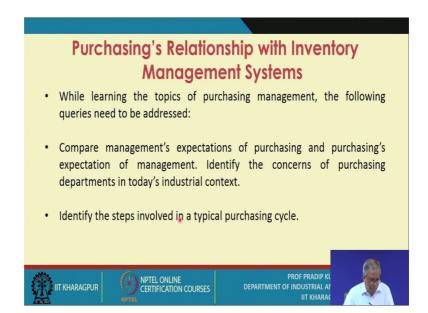
So, the first one factor which is which is affected by the purchasing that is the inventory controls. Second one is the safety stock amount already you are aware of the safety stock the concept and its measurement control of working stock inventory classification.

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Inventory records, buying methods and contracts surplus or excessive inventory, working of MRP and MRP-2 systems is solely dependent on say the purchasing departments say the performance and the JIT based systems.

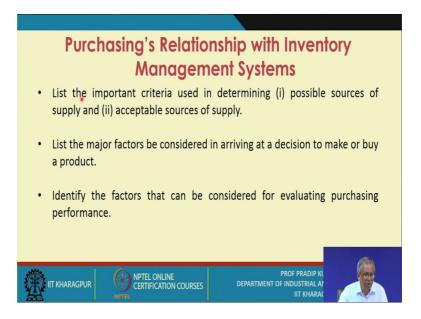
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So, while learning the topics of purchasing management, the following queries need to be addressed.

So, some of the queries are mentioned. So, you please go through them like identify the steps involved in a typical purchasing cycle, compare management expectations of purchasing and purchasing expectations of management.

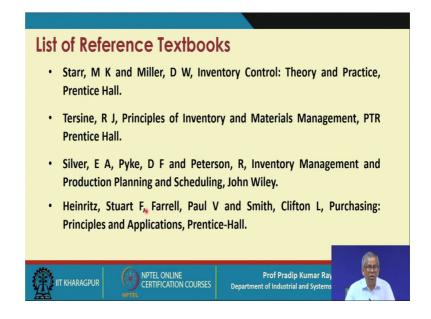
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List the important criteria used in determining possible sources of supply; already we have discussed and acceptable sources of supply list the major factors be considered in

arriving at a decisions to make or buy product this point, already we have elaborated and identify the factors that can be considered for evaluating purchasing performance.

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So, with this I conclude our lecture sessions on purchasing management.

Thank you.