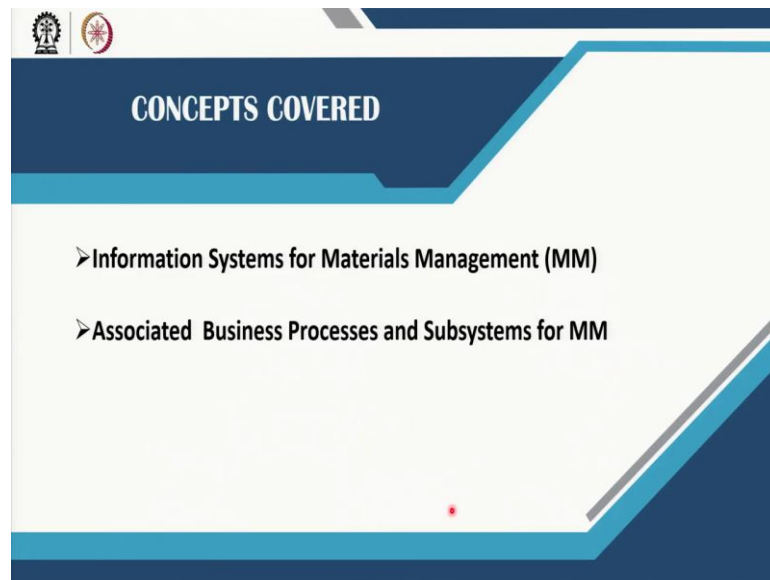


Management Information System
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Indian Institute of Technology, Kharagpur

Week - 05
Module – 03
Lecture - 22
Information Systems for Materials Management

Hi, welcome to Module 3 of the week 5 on 'Management Information Systems'! Today, we will be discussing about information systems for supporting the materials management function.

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The concepts that we will be covered are information systems for Materials Management, we call it MM. And, the associated business processes and subsystems for materials management. Because, this business processes and subsystems need to be known because, this functional details are required to understand what kind of information is required.

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Information Systems for Materials Management

- ❖ Materials management is one of the important functions in any organization wherein the materials alone may account for as much as 50% to 60% of the cost of the final product
- ❖ Proper attention and tight control is bestowed on this function to ensure proper utilization of available resources

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Materials management is one of the important functions in any organization, wherein the materials alone may account for as much as 50 to 60 percent of the cost of the final product depending on the product type. It might also go up to the extent of 70 percent. And hence, proper attention and tight control must be applied onto this function, to ensure proper utilization of available resources.

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Information Systems for Materials Management

- ❖ The magnitude of this problem increases when
 - the operations are of a large scale,
 - spread over multiple locations, and
 - the company manufactures wide variety of products

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And, the magnitude of this problem increases, when the operations are of a large scale, spread over multiple locations, and the company manufactures wide variety of products.

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Information Systems for Materials Management

- ❖ The main consideration that shapes management decisions in materials management is
 - to ensure maintenance of minimum stock all the time, subject to
 - ✓ availability of the right material,
 - ✓ at the right place, and
 - ✓ at the right time

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So, the main consideration, that shapes management decisions. In materials management is to ensure maintenance of minimum stock all the time subject to availability of the right material, at the right place and at the right time. And in order to achieve that availability of the right kind of information, at the right time is very-very important to a materials manager.

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Information Systems for Materials Management

- ❖ The inventory to be maintained depends on,
 - Demand
 - Lead time
 - Quality of material
 - Supplier reliability
 - Alternative material / sources

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Because he has to maintain minimum stock that is inventory, he requires information on demand, lead time, the quality of material, the reliability of the supplier from which the

material is to be procured. If any alternative material can be used for the same purpose, whether alternate sources of supply exists for those kind of materials, incidentally lead time here means, the difference in days between placement of purchase orders on to the suppliers and the point in time, when those materials are received inside the factory.

So, materials manager they require information on the demand for those items, they require information on lead time for supplying, those items they will also require information the quality of material, they will also require information on the reliability of suppliers. And, all these information is stored in the materials information system database.

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The slide is titled "Information Systems for Materials Management" and features a background with a stylized tree of icons representing various supply chain and manufacturing concepts. A speaker is visible in the bottom right corner of the slide frame.

Information Systems for Materials Management

- ❖ And the most important factor on which the inventory to be maintained depends on,
 - prompt and up-to-date information on
 - shipments,
 - receipts,
 - rejections,
 - stocks, and
 - consumption for enabling better control

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So, we got we have to know that the most important factor, on which the stock for an item is maintained, is prompt and up to date information on the various kinds of shipments, the receipts, the rejections, the different I kind of items their quality, the stock that is the existing for each of these items and consumption. What is the rate of consumption for enabling better control?

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Information Systems for Materials Management

- Thus, an efficient MIS almost always helps the managers,
 - ☐ to reduce inventories and
 - ☐ ensure availability of
 - ✓ the right material,
 - ✓ at the right place, and
 - ✓ at the right time

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So, the primary purpose of an efficient management information systems to support materials management function, will always help a materials manager to reduce inventories. And, ensure availability of the right type of material, in right quantities, at the right place and at the right time.

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Information Systems for Materials Management

- ❖ The primary objectives of MIS for “materials management” are,
 - To maintain up-to-date stocks of all materials
 - To immediately respond to any changes in the production plan, due to
 - To respond to changes in the demand pattern, or actual production, by generating delivery schedules and purchase orders for suppliers

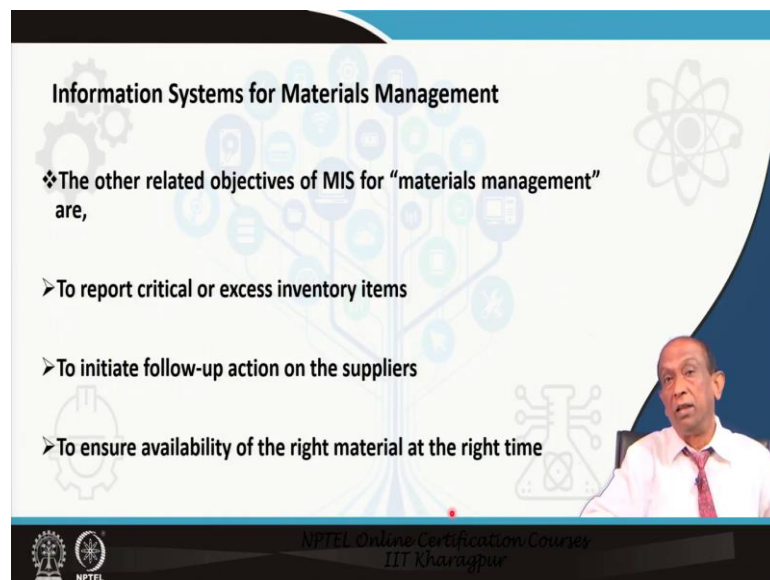
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So, the primary objectives of MIS for supporting materials management function, are to maintain up to date stocks of all materials to immediately respond to any changes that take place in production plan. And, changes in production plan happen, because the

company has to respond to the changes in the customers demand. There can be based on these changes in the demand pattern, there can be changes, in the actual production plan or actual production that is getting generated.

If the production plan is changed if the requirement gets changed, then the amount of material that needs to be purchased also will change. And, the materials management information system helps the materials manager to generate, immediately revised delivery schedules and purchase orders revised purchase orders may be placed on to the suppliers.

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The slide is titled "Information Systems for Materials Management". It lists the following objectives of MIS for "materials management":

- ❖ The other related objectives of MIS for "materials management" are,
- To report critical or excess inventory items
- To initiate follow-up action on the suppliers
- To ensure availability of the right material at the right time

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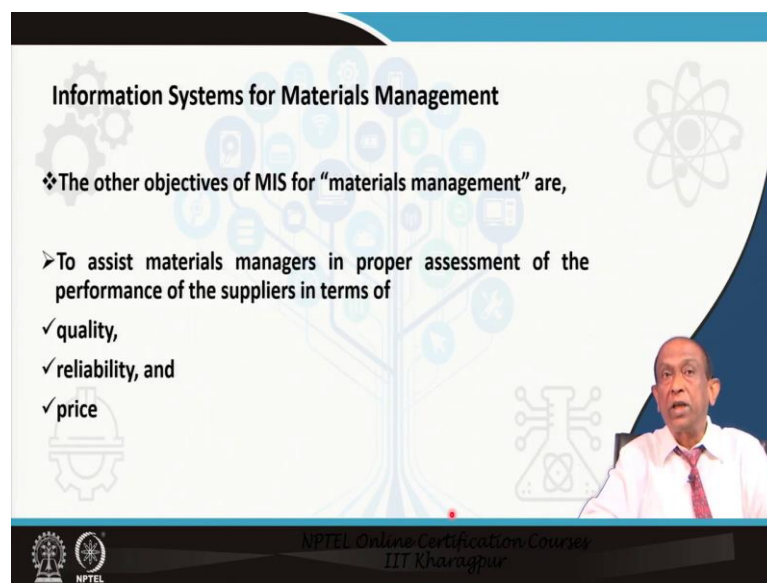
The other related objectives of MIS for materials management are; to report on critical or excess inventory items. Critical means, the items which are in stock is below a particular level. And, there may be short supply or these items might fall short of the required production quantity, the production line might run dry if this items are not there. So, these are critical items.

Materials manager must know periodically that which are all these items which are critical so, that they have to expedite the orders for those items from the suppliers. Excess inventory items; excess inventory items means, the stock for those items are very high companies unnecessarily incurring inventory holding cost for those items, the level of stock for those items need to be reduced.

So, materials manager they really need information on that in a periodic manner. So, whether an item is critical or the stock for that item is very high, materials manager need to initiate various action plans, comprising of following it up with the suppliers expediting the orders for critical items. And, they need to institute action plans for reducing the stock, for excess inventory items.

Maybe they have to reduce or optimally determine the amount of safety stock that need to be kept for those items, there may be excess buffer stock, ok. So, determination of optimal safety stock or which we call buffer stock, is very important for a materials manager. And, in order to do that they require adequate information from the materials management database. So, overall the MIS for materials management should help the materials manager to ensure availability of the right material at the right time.

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The slide is titled "Information Systems for Materials Management". It contains the following text:

- ❖ The other objectives of MIS for "materials management" are,
 - To assist materials managers in proper assessment of the performance of the suppliers in terms of
 - ✓ quality,
 - ✓ reliability, and
 - ✓ price

The slide features a background with a stylized tree and various icons. A small inset video shows a man in a white shirt and red tie speaking. At the bottom, there are logos for NPTEL and IIT Kharagpur.

The other objectives of MIS for materials management are to assist materials managers, in proper assessment of the performance of the suppliers in terms of quality of supply, so supplier's reliability and price. This particular function is known as vendor rating, or supplier rating. And for rating the suppliers, all information related to these items are required.

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Information Systems for Materials Management

❖ The other related objectives of MIS for “materials management” are,

- To accurately report on the current inventories and forecast the same for the future periods
- To enable the top management in review and formulation of purchasing policies
- To provide demand forecasting for material planning

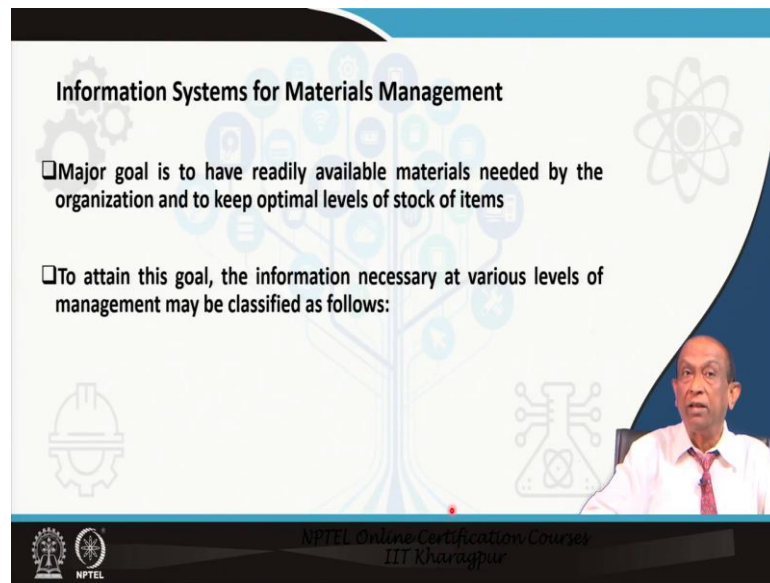
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The other related objectives of MIS for materials management are to accurately report on the current inventories; that means, what is the present stock level for all the items? And, based on the consumption pattern or the consumption history of all these items, materials manager need to forecast the requirement of stock for these items in future periods, and MIS for materials managers must support that.

So, maintenance of consumption history is a very important function of this kind of MIS. And sometimes there are inbuilt models which is a part of decision support systems that gets embedded or interfaced with MIS for materials management to forecast the requirement for pasts or items based on consumption history data, which is stored in the materials database.

Among the other related objectives of MIS for materials management are to enable the top management, in review and formulation of purchasing policies. This kind of MIS also provide, support for demand forecasting, which is required for material planning.

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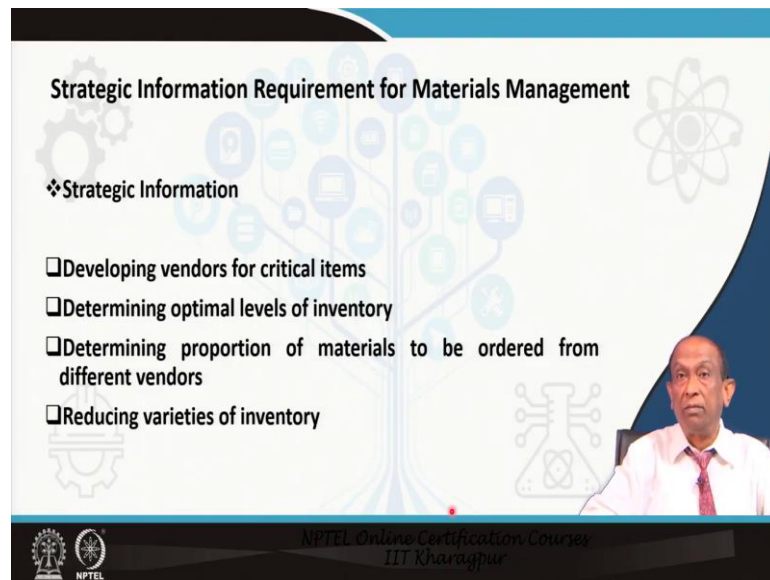
Information Systems for Materials Management

- Major goal is to have readily available materials needed by the organization and to keep optimal levels of stock of items
- To attain this goal, the information necessary at various levels of management may be classified as follows:

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So, the major goal is to have readily available materials needed by the organization and to maintain optimal level of stocks for these items. To attain all these primary goals, the information necessary at various levels of management, again may be classified in terms of strategic information, tactical information and operational support information.

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Strategic Information Requirement for Materials Management

- ❖ Strategic Information
 - Developing vendors for critical items
 - Determining optimal levels of inventory
 - Determining proportion of materials to be ordered from different vendors
 - Reducing varieties of inventory

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Strategic information, information's needed on a long term basis. For example, all those items for which there are not many alternate sources of supply, or there may be only one supplier. For example, fuel injection pump for automotives, there may be only one

supplier in the whole country. Even suppliers for precision bearings are very limited. So, the organizations might require information, for developing suppliers for such kind of critical items. Another strategic exercise which materials managers often carry out is to determine the optimal levels of stock for items, which is also a part of strategic information.

Other components of strategic information comprise of determining proportion of materials to be ordered from different vendors; that means, they have to determine the share of business of each suppliers, based on supplier's performance over a period of time. Strategic information pertain to reducing varieties of inventory. So, even for standardization and simplification, materials manager require strategic information of this kind.

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The slide is titled "Tactical Information Requirement for Materials Management". It features a background with a stylized tree of icons representing various materials management concepts. The text on the slide is as follows:

Tactical Information Requirement for Materials Management

❖ Tactical Information

- Developing vendor performance measures
- Determining optimal reorder levels
- Determining issues of items to shops versus standard needs

In the bottom right corner, there is a video inset showing a man in a white shirt and red tie speaking. At the bottom of the slide, there are logos for NPTEL and IIT Kharagpur, along with the text "NPTEL Online Certification Course IIT Kharagpur".

Now, we come to tactical information requirement. In this category information is required to develop vendor performance measures, supplier performance rating measures. Materials manager need to determine optimal reorder levels for items reorder levels means, if the stock for the item falls below a specified quantity, fresh order has to be released on to the suppliers.

So, what is that level of stock? Is basically called the reorder. Below the reorder level whenever the stock falls below the reorder level, fresh order quantity is released onto the suppliers, through purchase order. Practical information requirement consists of

determining issues of items, to shops versus standard needs. So, the consumption details and the standard needs information must be maintained.

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Tactical Information Requirement for Materials Management

❖ Tactical Information

- Controlling high value of inventory
- Determining impact of
 - ✓ material cost,
 - ✓ procurement with design changes, and
 - ✓ new project introduction

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Tactical information which are generated from this materials management information system, helps materials managers to control, high value of inventory. This kind of systems help them to determine the impact of material cost, procurement with design changes and for new project introduction.

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Operational Information Requirement for Materials Management

❖ Operational Information

- List of excess and deficient items received
- List of items rejected
- List of critical items received

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Operational information requirement for materials management comprise of list of excess and deficient items received, list of items rejected, list of critical items received.

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Operational Information Requirement for Materials Management

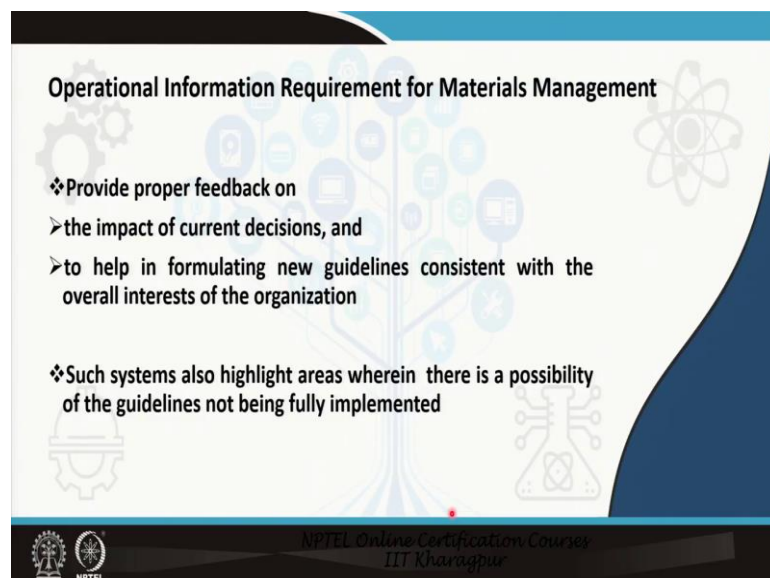
❖ Operational Information

- List of items in transit and under inspection
- Value of inventory-on-hand
- Goods received, rejected, and issued

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List of items in transit and under inspection, value of inventory on hand. What is the current stock value? What is the value of stock that is received? How much quantity of item has been rejected? What is the consumption quantity of different items? So, goods received, rejected and issued this kind of details, form a part of the operational information required for a materials manager.

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Operational Information Requirement for Materials Management

❖ Provide proper feedback on

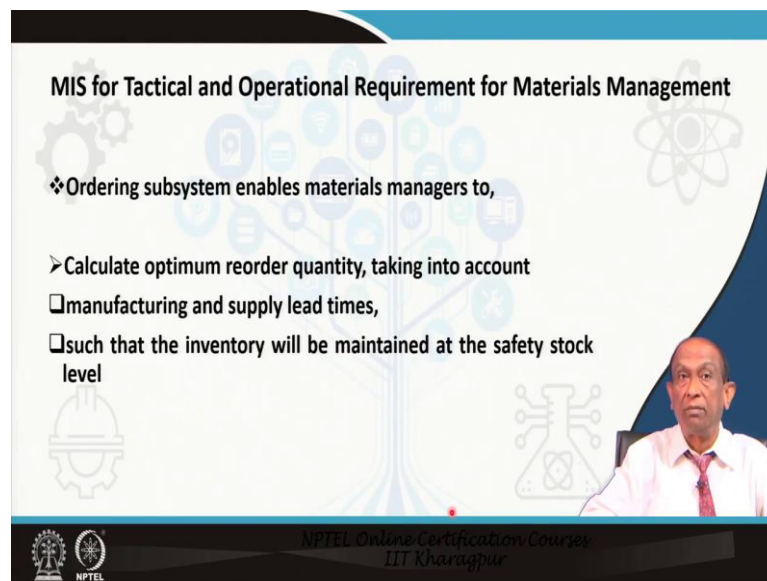
- the impact of current decisions, and
- to help in formulating new guidelines consistent with the overall interests of the organization

❖ Such systems also highlight areas wherein there is a possibility of the guidelines not being fully implemented

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Operational information requirement for materials manager help them to decide on the impact of the decisions, they take for routine operations. It will also help them in formulating new guidelines, which are consistent with the overall interests of the organization. Such systems also highlight areas, wherein there is a possibility of these guidelines not being fully implemented and that is a area of concern. So, materials manager require supporting information for that.

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MIS for Tactical and Operational Requirement for Materials Management

- ❖ Ordering subsystem enables materials managers to,
 - Calculate optimum reorder quantity, taking into account
 - manufacturing and supply lead times,
 - such that the inventory will be maintained at the safety stock level

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Then, another important subsystem is ordering subsystem, which is a part of this materials management information system. The ordering subsystem enables materials managers, to calculate optimum reorder quantity, for each item taking into account the manufacturing and supply lead times. And, this information is available in the materials database. Such that the inventory will be maintained at the safety stock level only.

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MIS for Tactical and Operational Requirement for Materials Management

- ❖ Ordering subsystem enables materials managers to
 - Prepare delivery schedules for each supplier of each item, taking into account
 - ✓ the minimum lot size,
 - ✓ transit time, and
 - ✓ inter-shipment times

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Ordering subsystem enables materials managers to prepare delivery schedules for each supplier of each item, taking into account the minimum lot size specified by the supplier the transit time and inter shipment times. Transit time is the difference in time, between the supplier's shipment date and the time when these items are received in the factory.

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MIS for Tactical and Operational Requirement for Materials Management

- ❖ Ordering subsystem enables materials managers to
 - Maintain firm minimum schedules on the suppliers
 - for some period,
 - as per the organization policy,
 - so that the suppliers get sufficient lead time
 - to plan their production to meet the revised requirements

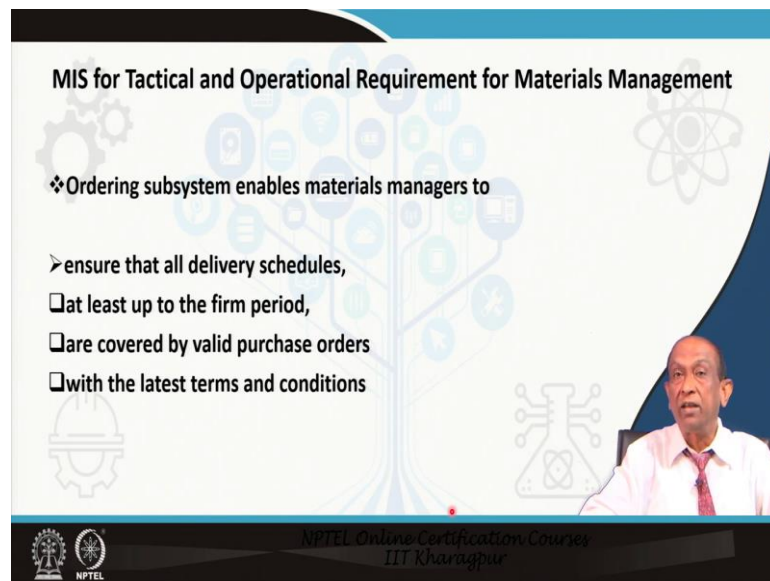
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Ordering subsystem enables materials managers to maintain firm minimum schedules on the suppliers for some period, as per the organizational policy. So, that the suppliers get sufficient need time to plan their production to meet the revised requirements. Because,

when delivery schedules are floated on to the suppliers, there is a period in the beginning which may be say 15 days, 1 month; 2 months depending on the organizational policy.

As a purchaser the firm cannot change, the quantity specified during that period on to the supplier. Because, supplier are also needs a needs an indication of the requirement, which is very firm because, he has to also plan his production.

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MIS for Tactical and Operational Requirement for Materials Management

- ❖ Ordering subsystem enables materials managers to
 - ensure that all delivery schedules,
 - at least up to the firm period,
 - are covered by valid purchase orders
 - with the latest terms and conditions

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Ordering subsystem enables materials managers to ensure that all delivery schedules at least up to the firm period are covered by valid purchase orders, with the latest terms and conditions. So, efficiently generating those purchase orders is another support that materials managers get from this kind of information systems.

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Operational Information Requirement for Materials Management

- ❖ System Deliverables include,
 - ✓ Monthly inventory statements
 - ✓ Inventory forecast and budget
 - ✓ Critical items report

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System deliverables from a materials management information system, include monthly stock statements for all items, which is also known as monthly inventory statements. Forecast, inventory forecast and budget, critical items report all those items for which the stock is below a specified levels.

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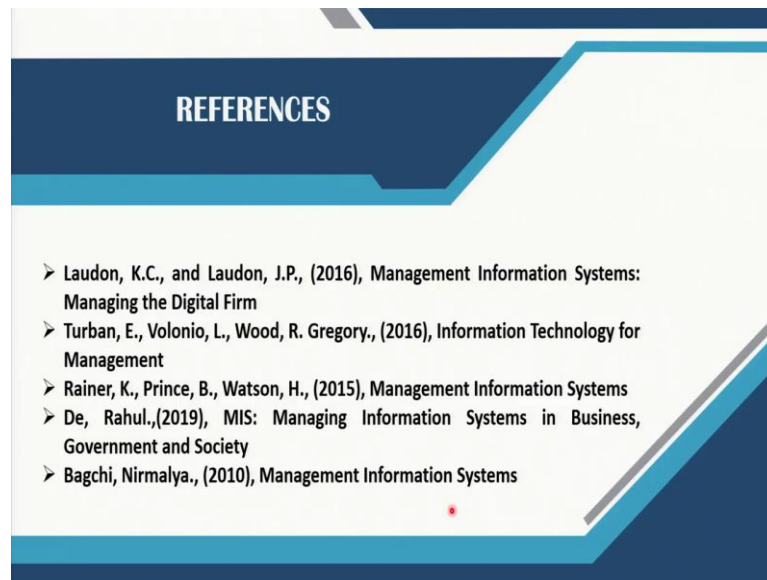
Operational Information Requirement for Materials Management

- ❖ System Deliverables include,
 - ✓ Effect of price changes of raw materials and components in the product
 - ✓ Theoretical versus Actual issues report
 - ✓ Ideal inventory report
 - ✓ Non-moving / Obsolete items report
 - ✓ Purchase Variance report

The slide features a background with a stylized tree of icons representing various materials management concepts. A small inset video of a speaker is visible in the bottom right corner. The NPTEL logo and 'IIT Kharagpur' are at the bottom.

Effect of price changes of raw materials and components onto the product, theoretical versus actual consumption report, ideal inventory report nonmoving or obsolete items report, purchase variance report and things like that.

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So, these are the references that I have used in this particular module. Thank you all for kindly having patience! And please go through the slides to get a clear idea of the support that is provided by this kind of systems.

Thank you all!