Operations Management
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Lecture - 60
Enterprises Resources Planning (ERP)

[FL], Friends. Welcome to the last session of our course on Operations Management. And today our focus is on enterprise resource planning. In the last week, we have discussed the latest trends in operations management, we have covered the concept of JIT that is just in time, we have covered the concept of Kanban, we have covered the concept of materials requirement planning, and today we are discussing the enterprise resource planning.

So, in these two and half hours, we have just tried to discuss or we have just tried to highlight the important concepts that have developed in the last 10 to 15 years time in the field of operations management. Most of the companies these days are focusing on these concepts to make their system more robust, to make their systems more efficient effective and productive. They want to minimize the waste either in terms of manpower, or in terms of money, or in terms of time, or in terms of maybe the other kinds of waste that may be creeping in the industry that may be the unnecessary movement of men and machines, may be unnecessary utilization of space, or unnecessary may be say wastage of space.

So, the optimization may be in terms of money, man, machine, movement, anything, but the focus these days is to make the systems more and more efficient, to make the production more and more effective, and in overall maybe the target has been to improve the productivity of an organization.

So, in the last maybe 59 sessions, our focus has been on both the theoretical aspects also, we have tried to cover the numerical problems also wherever possible, and overall we have tried to give a picture of the complete operations starting from what has to be produced, that has to be decided in the product design and development stage. Then how much has to be produced, we have answered in the sales forecasting or demand forecasting session; where we must locate our organization of or our factory, we have discussed in plant location. Then how our machines have to be laid out, we have

discussed in plant layout. Then how to manage the time for manufacturing? We have covered in project management in terms of CPM and PERT. Then we have seen, the production control sequencing scheduling of our operations, thereafter we have covered the quality concept we have covered the materials management aspects.

So, currently we are covering the JIT Kanban materials requirement planning or MRP and ERP systems. So, basically we have tried to address all aspects related to the overall concept of operations management. And today the last topic that we are going to cover is going to integrate, all the functions related to the operations or the process of conversion of a raw material into the final product. So, the complete enterprise has to be managed as a single entity, and all the resources have to be planned have to be executed centrally, so that the information is available with all stakeholders within the enterprise, in order to better coordinate cooperate, as well as execute the work related to the organization.

So, our focus today will be to understand the basic concept of enterprise resource planning, most of the time we have heard this word ERP, and most of the engineers know the word ERP, we will try to understand it from the context of the manufacturing unit that where the product is getting converted into the final, or maybe the raw material is getting converted into the final product. And we will try to see that what are the advantages we can derive, if we have a centrally managed system, instead of a decentralized system where we have different nodes of information, and sometimes there may be lack of coherence between the different nodes of information.

So, it is always better that you have a central facility where you have all the information available, and this central facility can control the all control, the overall operations of the organization. So, let us now try to understand the concept of enterprise resource planning, in the next 20 to 22 minutes.

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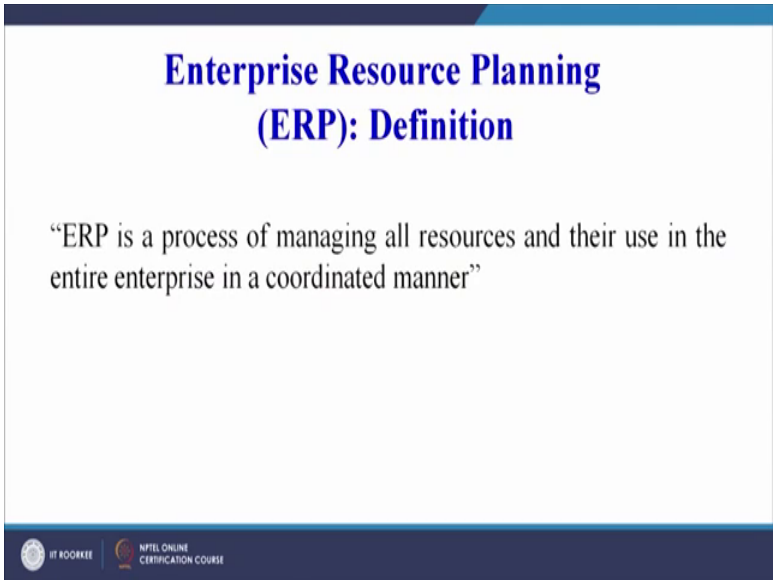

So, enterprise resource planning what is the definition, now ERP is a process of managing all resources, now all resources means men, machine, equipment, material, money so everything included. So, ERP is the process of managing all resources, and their use in the entire enterprise in a coordinated manner, so everything has to be centrally coordinated, all the resources in terms of man, material, machine, money, equipment has to be controlled centrally. And it is a complete enterprise wide control mechanism, it is not distributed control; it is a centralized control of a system or of the organization.

So, again for your understanding I will again read the definition, a ERP or enterprise resource planning is a process of managing all resources, and their use in the entire enterprise in the coordinated manner. What is ERP now, the practice of consolidating an enterprise's planning, manufacturing, sales and marketing efforts into one management system?

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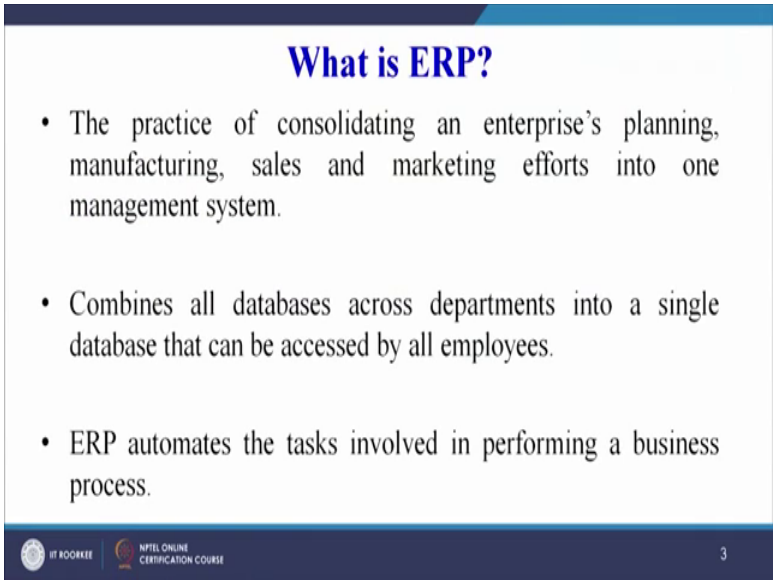

Now, you can see the planning activity or the planning part, the manufacturing part, the sales part, the marketing part even the financial part, the human resource department all have to be coordinated and integrated into one central management system. It combines all databases across departments into a single database that can be accessed by all employees. Here I would slightly like to emphasize that the access, may be limited to different levels of hierarchy, or different levels within the organization. Maybe the top level management may have access to more information, as compared to the bottom most level of hierarchy within the organization.

So, maybe the access may be limited in context of the designation of the various employees, but all the databases will be integrated into one single central management system. So, ERP automates the tasks involved in performing a business process, so you have now a central management system, and it will help you to better manage all the processes involved in running a business.

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Now, major reasons why one should go for an ERP system, it integrates the financial information, integrates the customer order information, standardize and speed up the operations or the processes, reduces the inventory, standardized HR information or human resource information. So, maybe these are just few of the reasons for adopting ERP. The advantages when we will see, we will ourselves be able to make a long list of reasons why a company must go for an ERP system.

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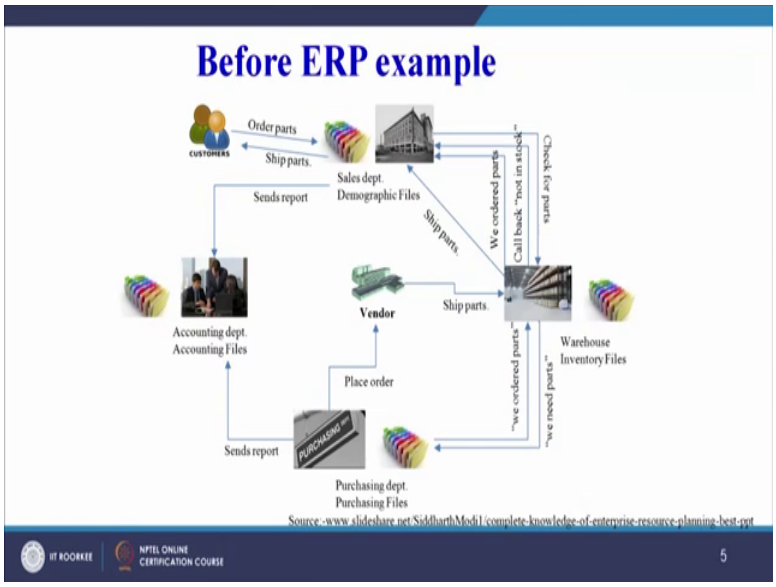

Now, let us take an example, the source is given here, it is from the slide share dot net, a presentation which is available you can go through the complete presentation, download the presentation and look at the other aspects of ERP system there. But from the

explanation point of view, this is a conventional maybe system without an ERP system in place.

So, here normally what happens is this is the customer, so the customer order a part, so this to the sales department, then sales department gets in touch with the warehouse, the checking the availability whether we have the ordered part available with us or not. Suppose it is not available again, it will send an order to the purchasing department, purchasing department will get in touch with the vendor, and then the vendor will produce the part, and then we may be able to supply the order. Similarly there will be accounting department also which will be the complete loop.

So, we have seen that once we have placed an order here, how it will function. First of all order the part, we check for the parts, parts are not available, we need the parts, we will send an order to the purchasing department, purchasing department will get in touch with the vendor. So, once the parts are procured we ordered the parts, call back to the sales that we do not have the parts in stock and then we will give an information, we have ordered the parts. So, the sales department will be in touch with the customers and updating them, regarding the status of their order.

So, maybe we can see that there are different nodes of information or different sources of information at different positions. But we want to integrate them into the common system, so that the sales department can directly check that, what is the status of stocks, whether we must take the order or we must postpone the order, or we must go for maybe back ordering, we can talk to the customer that we will be able to meet the target by such and such date. Because at the sales department only they must be able to check in the centralized management system, that what is the stock of the material available, and that is the basic concept of enterprise resource planning. And in today's scenario where IT enabled manufacturing is being done, or IT enabled management is being done.

It is very easy to check sitting in the sales office that what is the stock of material available, in the warehouse? So, that is basically the overall concept of integrating, all the functions into one function of management. So, all of all functions such as finance, sales, marketing, production all have to be or HR, have to be integrated into a single function.

So, here we can see the information travels quite a lot, from one section to the another section, then to the third section, and then to the next section, and this flow of information sometimes may be distorted things may get delayed. So, these things can be avoided if we integrated integrate all these functions into a common single platform, and that is the major objective of enterprise resource planning.

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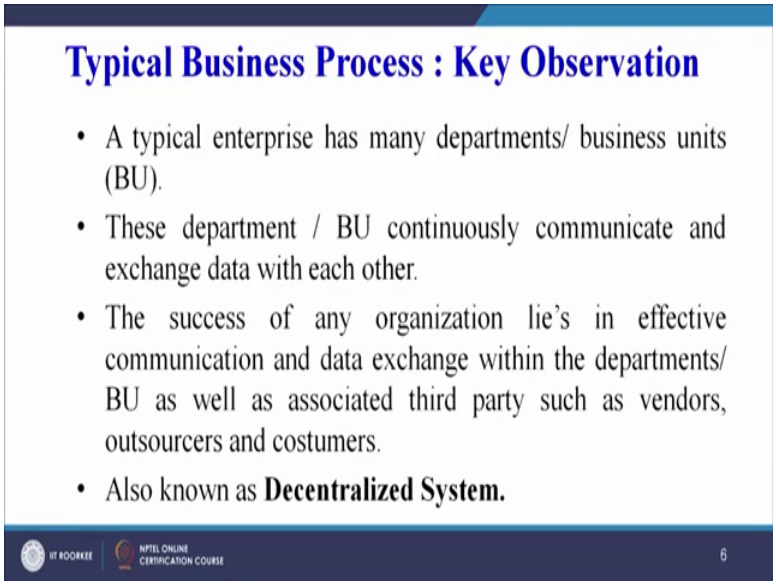

So, here we can see a typical business process that whatever was happening, in the previous diagram. A typical enterprise has many departments or business units, these departments continuously communicate and exchange data with each other as was happening, in the previous diagram sales department gets an order they get in touch with the warehouse, the warehouse get in touch with the purchasing department, purchasing department gets in touch with the financial department or accounting department, then they get in touch with the vendors.

So, you can see there are different business units are different departments who are interacting with each other. The success of any organization lies in effective communication and data exchange within the departments, as well as associated third party such as vendors, outsourcers or and the customers. So, this is a kind of a decentralized system where there is communication among the various departments or the business units.

Now, what can be the problems, so this is the system which is already existing every company is having a most of the companies, which do not have a ERP system, have a decentralized system only, and what can be the problems associated with such companies, we can see numerous disparate information system are developed individually over the time.

Integrating that data becomes time and money consuming, so we do not have an integrated data at a single place. Inconsistencies and duplication of data is there, sometimes we do not have a consistent data for example, in a particular college there is a academic office, and there is a student welfare office. Many times there is inconsistency in data; the student welfare office may have a different number of students registered with them. And the dean academic office, may have our academic office, may have a different number of students registered with them. So, you have an inconsistency within the same institute, two different offices; have two different number of students at the same time, which may be the inconsistency in the data.

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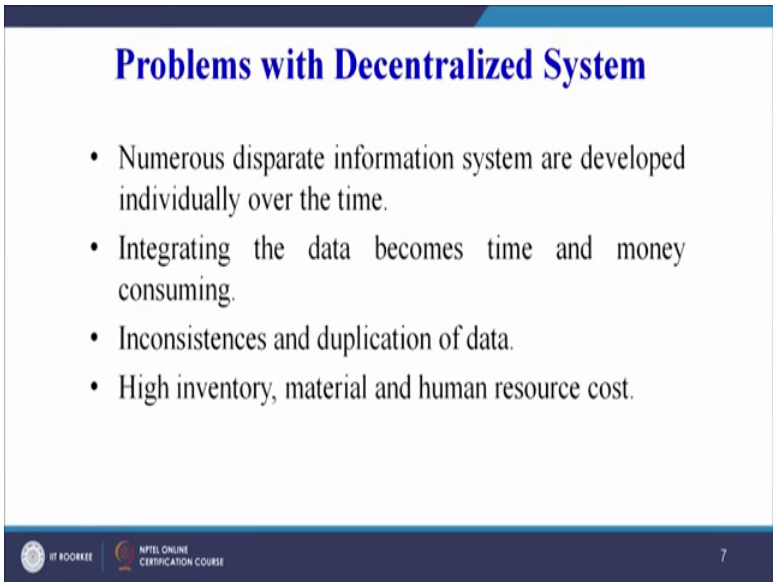

So, high inventory is involved usually, because we do not have online data or a centralized data available with us, and material and human resource cost is also high. Now, how we can overcome these problems of the decentralized system, we can do this with the help of a centralized system.

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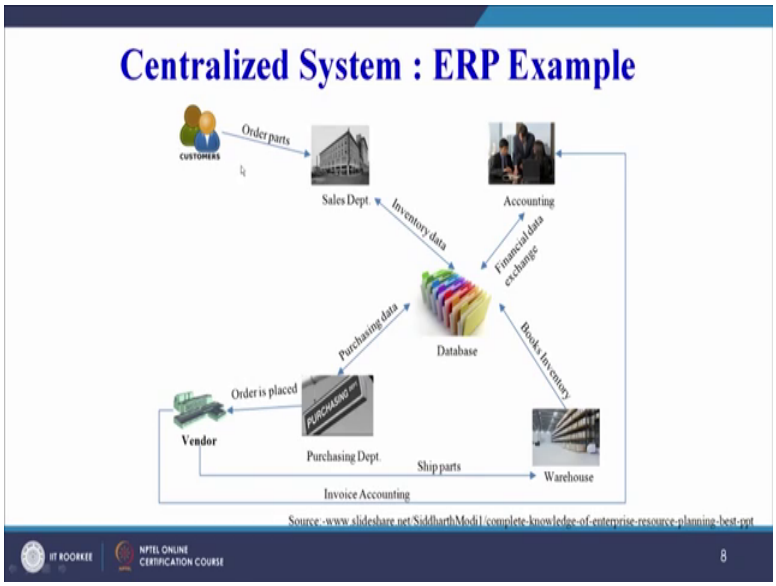

Where we can see the ordered, the customer's order the parts. The sales department has the inventory data already available with them, so they can check that whether they can take the order or they can refused the order, or they can negotiate with the customer regarding the due delivery dates of the order. Now accordingly once they check they will the you even if the material is not available, immediately a message can be sent to the purchasing department, which will immediately order to the vendor, and the vendor will ship the parts to the warehouse and which will be booked in the inventory, and the order can be may be honoured or order can be delivered as per the contract agreement, or as per the understanding with the customer.

So, basically we can see if we have a centralized system, immediately the trigger will be sent to all the response or responsible departments, or business units which will start their function immediately, and we will be more responsive to the customers demand as compared to a decentralized system. And it will help us to be more efficient and effective, we will be able to save time, we will be able to save the resources, we will be able to save the money for the organization. So, we will try to list down all the advantages of this centralized management system vis-a-viz the decentralized management system.

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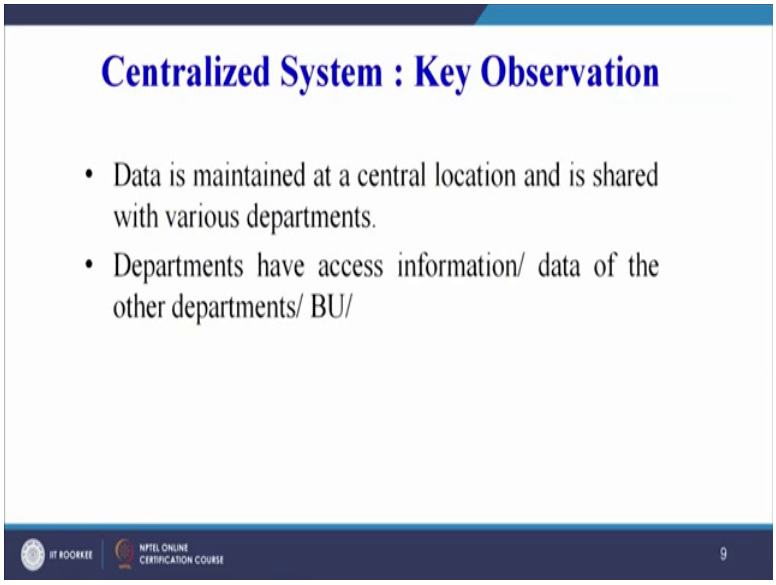

So, what is the key observation here, data is maintained at a central location and is shared with all the departments. Departments have access information, data of the other departments also. So, here one department can have or check the data of the other department also. So, therefore, you have a completely transparent system in place, wherever all data is available for everybody to use, as well as take decisions accordingly.

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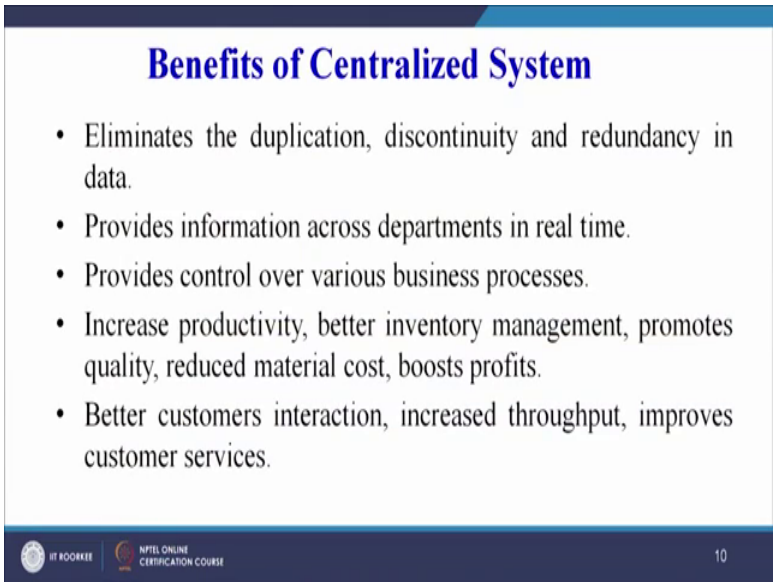

Now what can be the benefits of the centralized system let us try to understand. It eliminates the duplication discontinuity and redundancy in the data; moreover I would like to add another word that is inconsistency in the data. So, duplication discontinuity

and redundancy on top of that inconsistency in the data. So that is something which is maybe possible using a centralized system.

Provides the information across departments in real times, as soon as some material has been shipped from the inventory, immediately the people in the purchase department can get an idea, that this is the status of inventory available in the warehouse and how they should respond in order to replenish the inventors. So, real time data exchange is possible with between the various departments.

Provide control over the various business processes, increase productivity I think this productivity efficiency, effectiveness all these words I have used may be number of times in our discussion, because these are the keywords with which we try to manage the operations. If we do not use scientific methods of managing our operation, still the operations can be managed, but what we are compromising on, we will be compromising on the efficiency, we will be compromising on the effectiveness of our operations, we will be compromising on the productivity.

So, therefore, I have emphasized on these words again and again, so that whatever we are doing our major focus is to earn profit for our organization. Again if we implement the ERP system, it will help us to increase the productivity, it will help us in better inventory management, it will promote quality, reduce the material cost, as well as it will boost our profit. So, overall benefits definitely will be there, if we go for a centralized management system, or the enterprise resource planning system.

Better customer interaction, increased throughput, improves customer services. So, we can see that we are able to respond to the customers in a more, maybe effective manner, if we are having the ERP system in place.

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The ERP implementation may be, we may not be able to discuss in detail, but very quickly, we can see that how an ERP can be implemented. So, it will surely be one of the biggest IT project that most companies have ever handle, so why because it is a big project, where all data has to be integrated into one single platform. Data may be related to the employees, in context of employees also, their live records have also to be made online, their gratuity, their PPF, EPF, their retirement date all details of HR also has to be integrated.

So, I have just taken one example, that is HR department when it has to be integrated into the main system, what all requirements are there, what type of data will be required for each and every employee all data has to be entered. Similarly for purchase department all rules, all checks, all balances, all quality control processes everything has to be entered for the purchase department also because all the different organs or functions of the organization have to be integrated into a single platform.

So, you can see this will be one of the biggest project for any or biggest IT project for any company, so it changes the entire company. So, it is not going to affect maybe one section of the company, or one department or business unit of the company, it is going to affect all the company, all sections, all business units, all departments of the company. It will have repercussions in all departments, and divisions of the organization. It is essential that all the clip key, all the important players, all the key players understand the scope of the project, and this is an IT or information technology related project. Now

there are majorly four phases of ERP implementation, whenever a company decides to implement ERP these are the four stages.

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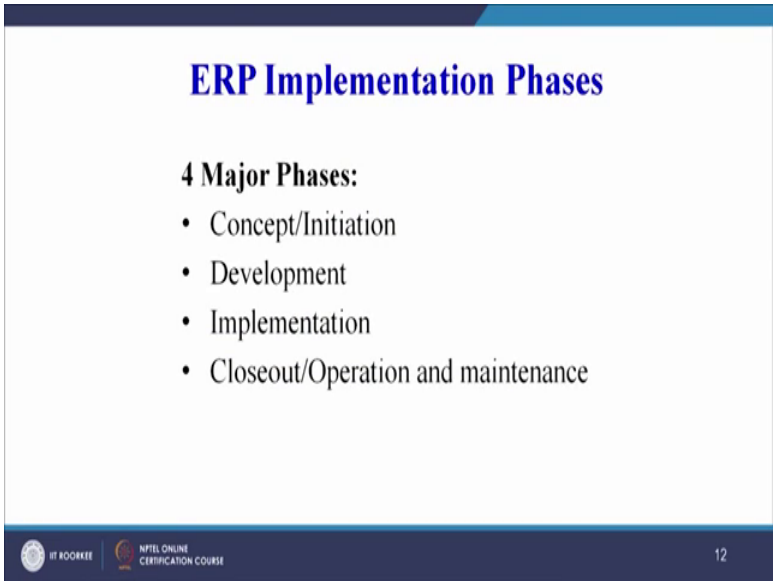

The first stage is the concept or the initiation, or the kickoff of the ERP project, then the development, implementation, closeout, operation and maintenance common to most of the IT based projects.

Now, what are the costs involved in ERP training cost is involved, now because everything has to be managed on the system paperwork will be eliminated or it may even lead to paperless management in the organization. So, training is required for each and every worker to understand that how he needs to operate under the ERP environment.

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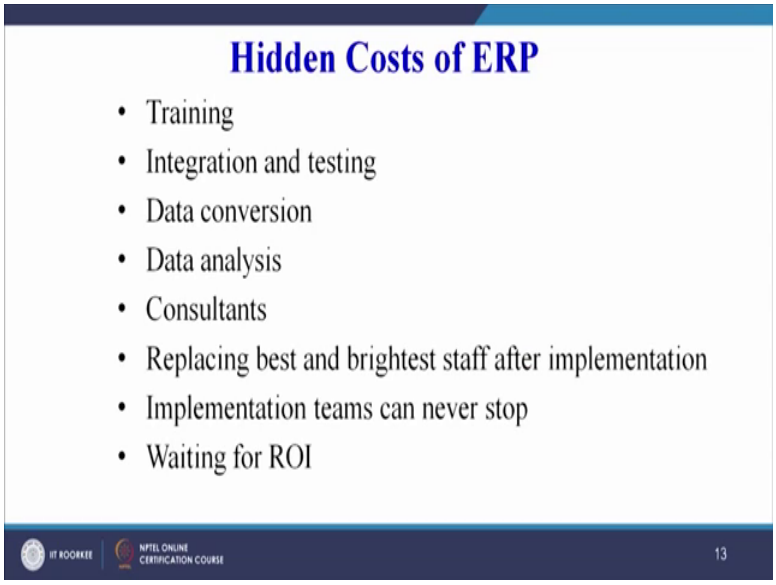

Integration and testing cost is involved, because now you have to integrate all the functions of the organization into one single platform. Data conversion, data analysis, consultants costs we need to pay replacing best and brightest staff after implementation, there may have to be maybe re reallocation of responsibilities and accountable to some of the staff members, who may become redundant after the implementation of the ERP. Implementation teams can never stop, because always they will be finding new and new things which can be integrated. And then you have to wait for return on investment, because the overall project will be a costly project, it will require investment on part of the organization and organization will always look to get their ROI as quickly as possible.

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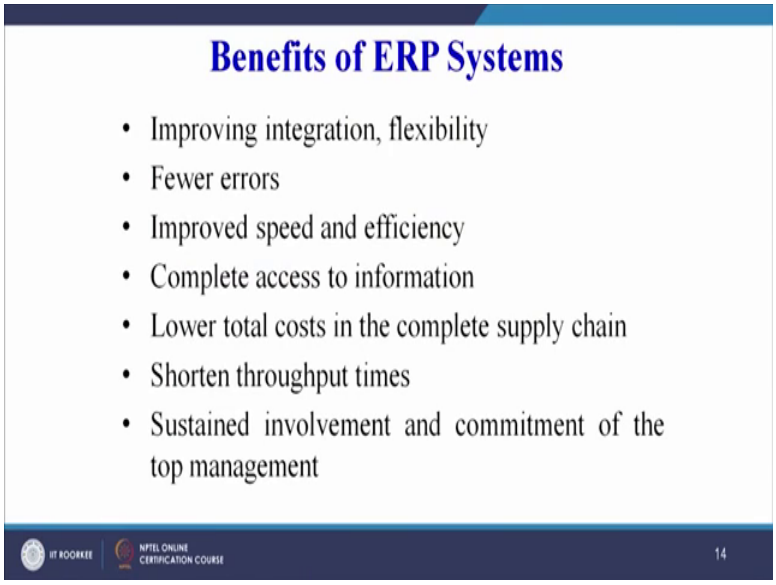

Now, what are the benefits lets quickly see the benefits, it will improve integration, flexibility will be more now, because everybody has access to all type of data within the organization. Errors will be less here, because automated system, computer driven system improved speed and efficiency, I must say speed and efficiency of decision making will become fast, because now all information is available to you on your desktop. Complete access to information, lower total cost in the complete supply chain, so the cost will reduce, shorten the throughput times, the manufacturing excellence can be achieved, sustained involvement and commitment of the top management, because now the top management has access to all the information at a single source.

So, we can see that there are a number of benefits that we can derive, out of implementation of a ERP system.

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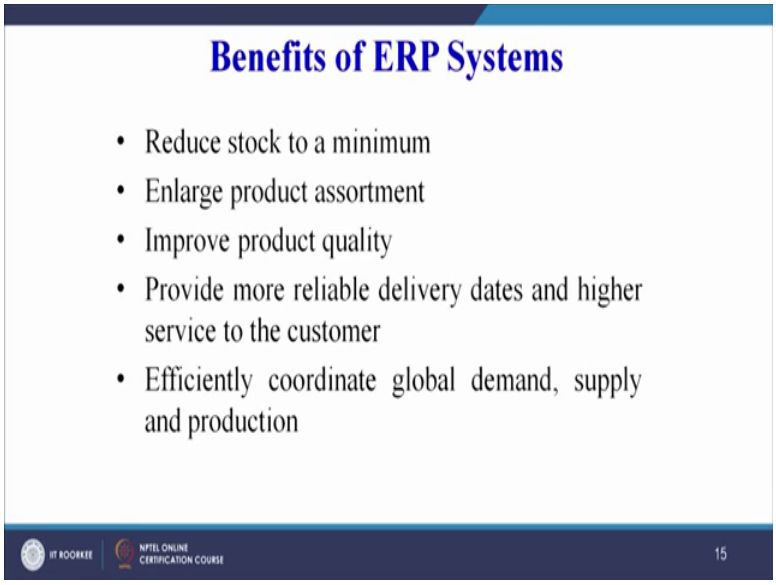

Now, other benefits are reduce a stocks to minimum, so it will reduce our inventory, enlarge the product assortment, improve product quality, provide more reliable delivery dates and higher service to the customer, efficiently coordinate global demand, supply and production. So, we can see that we can coordinate the global demand, because if we have seen the diagram, you try to understand from the diagram that we are able to coordinate now with the customers in a better manner as compared to a decentralized system.

So, we can see that there is a long list this list can further be improved or appended, and we can further highlight the advantages that we can draw by implementing that ERP system.

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Now, there are few risks involved with risk with the ERP implementation that it is expensive, because the system has to be customized as per the four rules regulations, functions, procedures of a particular organizations organization. Because all organizations have their own set of rules, guidelines, procedures that have to be integrated now into the standard platform that is available, so it is expensive because of the cost of customization, that is involved it is time consuming, because all data has to be integrated, and therefore requires lot of time, great risk for the organization, because sometimes the system may be functional for, so many years things must already have been optimized. And now we spend some money to further integrate the things together the benefits that we accrue out of making huge investment, may not commensurate with what we have thought of or the benefits that we are deriving after implementation of ERP.

Then transfer of knowledge is one also risk involved, and then acceptance with the within the company is also very very important, because many times we all the employees have that concept of resistance to change, and therefore once they have to change from the normal filing system to a new type of a filing system, which is software based. Sometimes the employees may feel that the previous system was much better as compared to the new system, and therefore may not feel very very comfortable with the ERP way of working within the organization. But still we can say, that wherever the companies have adopted the ERP system, they have been benefited in numerous terms, instead or sorry in spite of making huge investment the companies have gained profit, and ROI has been achieved by most of the companies. And in future also companies are

focusing their attention on centralized management system, because it gives us number of benefits. So, with this I conclude the today's session, as well as I conclude the course on operations management. We have completed 12 weeks of our discussion, and I think the course must have been enjoyable for all of you, it has been enjoyable for me as well as my team, and we have also learned a lot during the course.

All your queries, questions are welcome, because a single topic that we take there can be different perspectives of looking at that particular topic. Different books, different sources, websites may give different aspects of the topics, but what I believe as a teacher; the basic fundamental remains the same. In case you feel that there is something which needs to be addressed from a slightly different perspective, you can write on the discussion board, and me as well as my team would be more than happy to discuss to see that whether the things need improvement or we can have a look at a topic from a different perspective or a different angle also.

So, it is a learning process for all of you as well as for me as and my team. So, it has been a pleasure discussing all these topics, and I wish that whatever we have discussed will be of help to all of you, in overall improvement of your knowledge in this field of operations management.

Thank you.