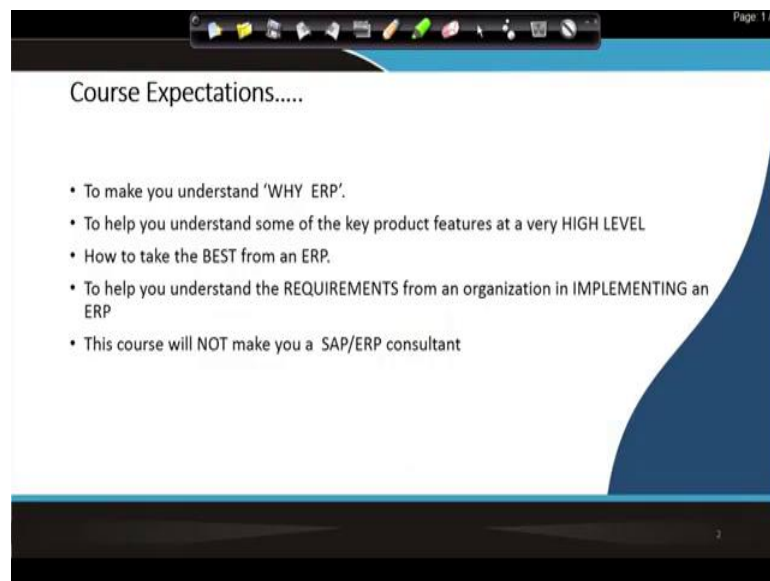


**Management Information System**  
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**Week - 03**  
**ERP**  
**Lecture - 10**  
**What is ERP?**

Hello everybody! Now, the introduction to MIS is over; now we will move into very specific topic one by one. So, the topic; first topic we will select here is ERP that is 'Enterprise Resource Planning' and the first session will be of course; what is ERP? So, ERP is enterprise resource planning; but that is the name. So, what it is, I give a brief view about that in the last session about that how an integrated software is used in organizations and that is known as 'enterprise resource planning'.

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So, moving on to our slides, the course expectation is to make you understand why ERP. So, why do we need ERP at all; and to help you understand some of the key product features at a very high level?

So, we will start at a very high level because it is a very complicated software and we cannot get into details because it is a subject by itself. So, as a part of MIS we will be only talking at high level of the ERP. So, that as a manager we can take you know the

right decisions about ERP, selecting an ERP, buying an ERP, investing in an ERP; that is what is required from the IT managers.

And how to take the best from an ERP of course; again what are the key features and things of ERP which you should be aware of, again as IT managers because you will need to invest money, because these are very costly, expensive softwares; so, you have to take a very judgmental view when you go and decide to buy an ERPs or invest in an ERP because these are very expensive products.

To help you understand the requirements from an organizations in implementing an ERP because again a very complex product. So, complex project management implementing it is difficult, is challenging. A lot of things like change management comes into play, people give lot of resistance because they fear losing jobs etcetera many other fears coming. So, you have to take care of all that assuming that you are a project manager implementing ERP.

So, I will give you a brief about how to and the what are the project management aspects of implementing an ERP program because, as again as an IT manager you should be aware of what is the complexities involved in implementing complex software projects in an any organization. And, ERP is just one of those complex software, there could be many other types of complex softwares which you need to implement as you go on your career, in an as an IT person in an organization.

So, this I will help you to be aware of what the risks are and how you should handle those risks and things like that. But, this a disclaimer this course will not make you an SAP or ERP consultant, because many people are aspired to become an SAP; SAP is one of the most popular ERP product we will talk about that later SAP. And, many people want to also become from MIS perspective they want to become SAP consultant, but this particular course will not make you SAP consultant.

So, this is just an overview course of a why as where we will touch upon ERP, SAP etcetera to give you all the flavors of SAP.

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The slide is titled "ERP Overview – Defining ERP....." and includes the following content:

- **Enterprise:** Any organization that has a set of common goals
- **Resource:** Assets of the enterprise in the form of Man, Machine, Material
- **Planning:** Planning for effective utilization of resources

ERP is **integrated** information system built on a **centralized database** and **common computing platform** helps in effective usage of enterprise's resources, **facilitates the flow of information** between all business functions of the enterprise.

The diagram illustrates a supply chain process flow from left to right: Vendors → Inbound Logistics → Manufacturing → Transportation → Distribution → Delivery → Customer → Consumer. Below this flow, two arrows indicate information flow: a left-pointing arrow labeled "Logistics and Distribution" and a right-pointing arrow labeled "Sales & Customer Service". A small video inset of a speaker is visible in the bottom right corner of the slide.

Now, ERP overview defining ERP we started with like what is an ERP. So, this will explain what it is basically. So, E is for enterprise; is any organization that has a set of common goals. So, that is what an enterprise is, resource is assets of the enterprise in the form of man, machine and material. You can add data to that because we are now saying data is the another resource. Planning, for effective utilization of resources. So, we need planning for effective utilization of resources.

So, any enterprise; so its you see the word ERP; so, says enterprise, the resource and we are planning. So, that is what all this product is doing, its managing the resource and planning for it. So, ERP the definition classic definition is an integrated information system built on a centralized database. So, it is not individual software machine's, PC's etc.; its built on a centralized database and common computing platform.

And of course, it is accessed by from all over the place through in from individual machines and it helps in effective usage of enterprises resources, facilitates the flow of information between all business functions of the enterprise. So, this is the key thing; effective usage of enterprise resource is one, the second is the last part; facilitates the flow of information between all business functions of the enterprise. And that is exactly why we are saying that ERP is one of the base one of the platform for the entire MIS system.

Because, unless you are able to integrate your different business functions on a common platform such that the information flows across all functionalities, you cannot have any proper MIS not possible.

So, MIS all MIS actually starts with an system; ERP is one of the such system. ERP not necessarily is the only system, there can be other systems also where different functionalities of your enterprise get connected on a single platform and you can share information across all the functionalities.

So, there is no wall as far as information flow is concerned there is no wall. So, one data entered at the security gate, when a goods comes in when a material comes in to a factory; a security watchman receives the material; sees the document the challan and then enters in his system that supplier so and so, material such and such, quantity such and such received on the date, time. He just enters these few data. Immediately across the organization everywhere this information is can be seen.

It flows is not really the light way of saying technically, it does not flow anywhere, it does not actually move, but of course, the intent the data gets captured in a central database and the central database is accessed by all functionalities. So, if you are a finance person are most important here the purchase person, the materials persons the stores the in charges stores or even the production guy. Suppose the production in charge is waiting for urgently for that material.

So, he is tracking it on his system; has it come, has it come, has it come. So, as soon as that watchman the security person enters that he will this when he sees the quantity for the material that what is a shop floor man is doing is searching quantity x and the name of this product whatever it is. Say it is called product x, what is the quantity available? Till now it was 0 morning, now 100 quantity gets supplied; the watchman enters 100, now he sees 100 immediately, real time.

So, he knows that 100 material has come. So, he immediately calls up the stores person, your material has come please bring into the stores immediately and send it to my shop floor my production is waiting. I have to deliver this material by end of the day.

So, give it to me as soon as Possible: ASAP; the stores person also sees on his screen yes the material has come. So, he gets it, he contacts the quality guy; the quality guy also

person sees on his screen that this material has come and it is waiting for quality inspection.

So, he immediately goes to the stores, sees the material, does the quality inspection and then puts his comments; and whether he accepts all or reject some; quality check, etc. So, let us assume, he accepts all; all are good quality. So, he passes that quantity, quality check; as soon as it becomes quality check in the system, the material becomes free to be issued to the shop floor. Till now it was not free; till the quality inspection is over, it was kept blocked that you cannot issue it.

These all being done by the ERP system, the software is doing it at the base bottom; you are only just entering some data. So, quality person enters yes 100 quantity passed, immediately that log gets released.

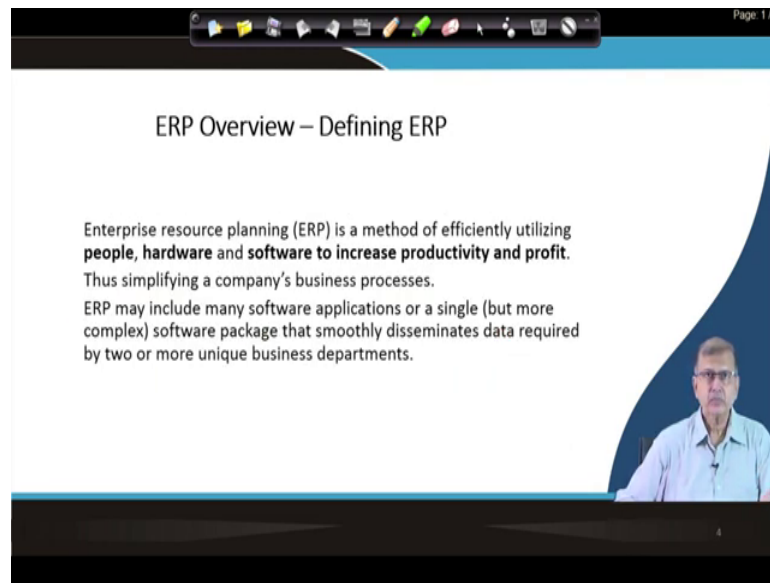
Now, the production person can issue the material from the stores; send his man with the trolley. He goes picks up those 100 quantity, brings his shop floor and he continues with his manufacturing operation; completes his order what we are supposed to and he is delivers it by the end of the day.

Now, the sales person, the sales guy what is he doing here? What is his role? What he is doing his customer is waiting for that material. So, he is also watching his screen he says oh yes the material has come and then in the production has got it and the final end of the day production has finished, it has gone to the finish good store. And so, now, he can issue an invoice to send it down, dispatch it to the customer. So, everybody is getting whatever information he needs and all from that system.

And, everybody nobody's talking to him, we are just on your screen your login you know yes whatever is my interest information I need its available, that is the beauty of the strength, the power or beauty of an enterprise resource planning software. So, several times in my discussion following similar examples will come up, but I try to give you at the beginning itself the overall basic concept of what is the power of an ERP. So, that is why ERP is such an important thing.

So, below in the picture it shows of course, the various entities how they are connected. So, vendors, inbound logistics; I was talking manufacturing, transportation, distribution, customer, consumer, everybody is linked to ERP.

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ERP Overview – Defining ERP

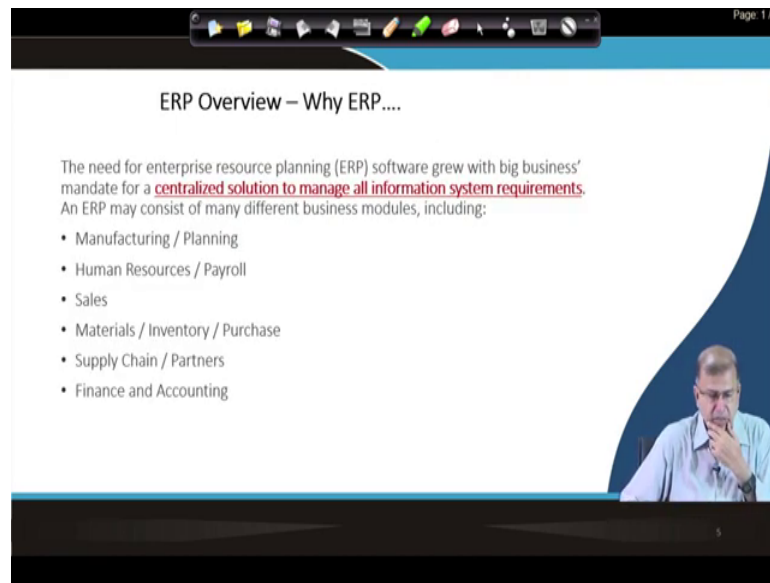
Enterprise resource planning (ERP) is a method of efficiently utilizing **people, hardware and software to increase productivity and profit.** Thus simplifying a company's business processes.

ERP may include many software applications or a single (but more complex) software package that smoothly disseminates data required by two or more unique business departments.

So, ERP defining continuing on the definition is a method of efficiently utilizing people hardware and software to increase productivity and profit. Thus, simplifying a company's business processes. ERP may include many software applications of on a; or a single but more complex software package that smoothly disseminates data required by two or more unique business departments. This is exactly what I was talking about to you in the previous slide.

The many departments are involved from the stores, security stores, purchase the, manufacturing, sales and they are all you know connected by this one particular software. And, all of these be helping to build efficiency into the system and when you build efficiency it is increasing your productivity and profit.

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ERP Overview – Why ERP....

The need for enterprise resource planning (ERP) software grew with big business' mandate for a centralized solution to manage all information system requirements. An ERP may consist of many different business modules, including:

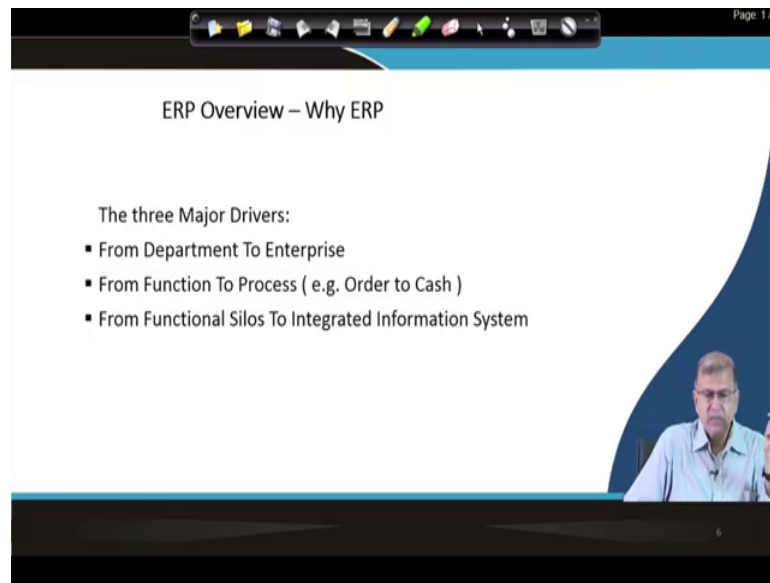
- Manufacturing / Planning
- Human Resources / Payroll
- Sales
- Materials / Inventory / Purchase
- Supply Chain / Partners
- Finance and Accounting

Why ERP? Again continuing the need for enterprise resource planning software grew with big businesses mandate for centralized solution to manage all information system requirements. So, I have been repeatedly saying, why it is a need; a basic thing of the base of foundation of this information system requirement. So, it has to be centralized solution.

So, everything has to be you know collected at a centralized server from where everybody can view their requirement. So, an ERP may consist of many, different business modules including like, these are the components – manufacturing, planning, human resources, payroll, sales, materials, inventory, purchase, supply chain, partners, finance and accounting, etc.

So, any you name you name any function and these are available in the best of class ERP softwares like SAP, Oracle etcetera. So, you it could be a including like environment health and safety; I have not included all of those, but everything is there; supply chain, customer CRM, CRM everything is in included into our ERP, modern ERP systems and softwares.

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Why continuing on why ERP; so, the three major drivers from shift from a department level to enterprise. So now, we are talking about the company as a whole. We are not talking about a finance department or a materials department or a purchase department or a sales department or a manufacturing department; it is a company, enterprise. So, it is all everybody's on a central database. So, it is becoming virtual.

So, instead of physically you are seeing of course, in a building when you enter. So, this is the finance department or that is a manufacturing shop floor we know it is always you can visible the whole half the thing is a shop floor the, those warehouses for example, your stores. So, we can physically you know see, but here in a system we convert that entire physical system into a logical system.

So, that is what IT and software does. So, what do you see physically now is becoming logical and virtual. So, there is you do not see anything physically separate things because in the software scale whatever you are allowed to see in a screen you see on your screen and from function to processes.

So, we call say accounts function or a finance function or a manufacturing is a function sales as a function. But, when you talk about process then it cuts across various functions. For example, a process is cupboard process known as order to cash, means from a sales order to a cash.



So, you receive his order from someone to deliver a product right. So, you create a sales order against that sales order you manufacture something. Once you manufacture something, you deliver it to your customer; once you deliver it to your customer you raise an invoice. Once you raise an invoice and the material is accepted by your customer then the customer releases your payment so, you get cash.

So, how it started? The first function was the sales, the sales department got an order that is the sales function then they release it to planning. So, planning is a planning function as part of production planning.

So, once the planning department, then tells the production manufacturing person to manufacture it and they break it up into various components what is required which is the bill of material. So, the production department does the manufacturing and for manufacturing the production department needs material.

So, it goes to the material department to get the material from the vendor, suppliers. So, that is a materials function material management or purchasing then once then you need of course, quality check at every stage production. So, that is quality management then you have of course, plant maintenance because machines have to be maintained. So, that is also a module separate functionality, maintenance department we are the maintenance department.

And then finally, when it is delivered it goes to the stores again that is part of materials management and then from there it is now shipped to the customer. So, one the shipping etcetera billing again is a sales function. Now, for doing all these operations of buying things etcetera getting material from the vendor, running the factory, energy, power, paying salaries to the labor you need money, cash. So, money is given by the finance departments; so, that is the finance or the accounts department that is the finance function.

And, then when this yours customer gets the material, he pays; once he pays that money comes into your company's bank account. So, that is again a finance function because it is an accounts receivable. So, the account once you generated invoice it becomes an account receivable that is in the accounts receivable book it will show that I am expecting so much money to come from such and such customer. And finally, where it comes you get cash; so, that is again a finance function.

So, you can see there are so many functions involved starting from sales and ending with finance; in between manufacturing, quality, plant maintenance, materials management, again sales and overall there was always finance. And, then there was always an HR because HR is always involved in your factory; employees and their payroll, etc.; is managed by training, etc.; managed by HR. So, HR is always there.

So, HR and finance are really they cut across again the whole thing, they are at the base and then you have individual functions; functional and pillars and that is known as a process orientation. So, from a function to process orientation order to cash; so, from functional silos to integrated information system. So, what I was talking about; so, long is that from functional silos means with boundary walls you have broken up all the boundary walls, now we have an integrated information system.

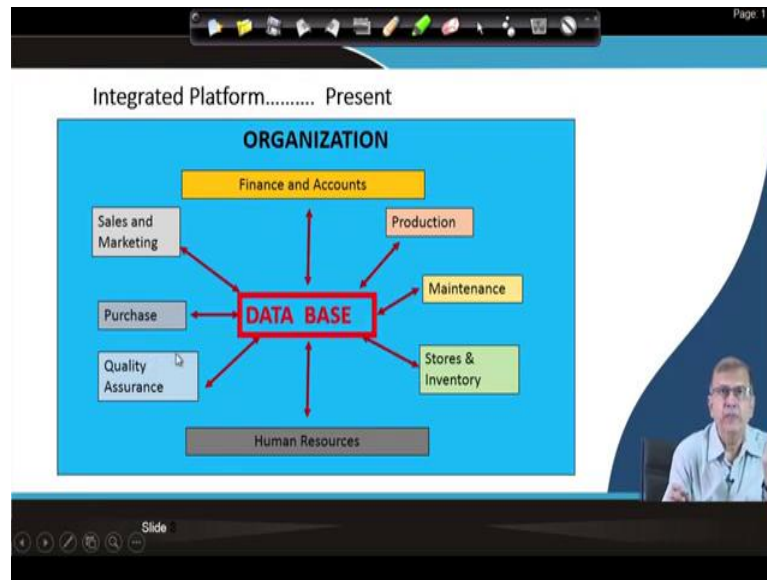
So, from the sales to sales or sales to finance, in between there were so many other functions; I was talking manufacturing, maintenance, quality, etc. It was all integrated because information was flowing automatically and everybody knew what is happening when from their own screen. Because, whenever you do a transaction; you hit a key enter etcetera that data is getting in updated into your database, central database. And, the central database is throwing up reports and information depending on which function is going to use it.

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Now, stand alone solutions just have the history before ERP, if an organization I was stuck on the like finance and accounts, sales and marketing purchase then you have quality assurance here.

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And, then slide got change sorry; then you have finance and accounts and then you have production, maintenance and stores and inventory and then a HR is of course, there here covering all. So, this was worked thought the history maybe 30-40 years back; most of them he is to work an isolated manner. And, everybody was generating their own data set of data and then it was either manually moved.

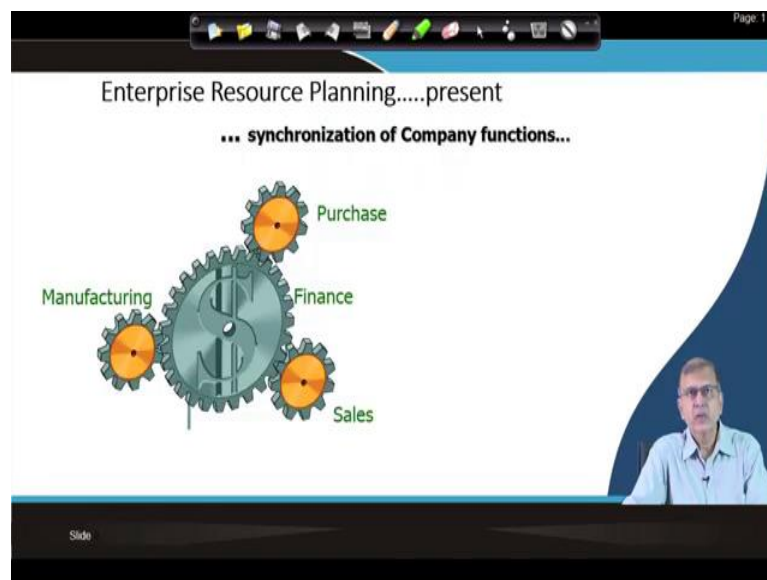
If you I do not think you have what about something called a floppy disk, you have not seen, but we have seen in early 80's, 70'ss and 80's floppy disk is used to be used to transfer data. Then later on it came CD, but those are on an outdated because now everything moves data flows through your fiber optic cables. And, this is what we have today that is a central database.

And, all departments and functions are connected to the database and everything is get stored in the central database and everybody accepts. So, the accesses the data. So, everybody is accessing the same set of data. So, there is no question of any mistakes or different data being given to different department. So, since that data is common unique in a central database whatever here is here is being seen by everybody; everybody sees the same data.

If the quantity was produced 100 by say production here and they say we produced 100 today then everybody concerned people for example, sales and marketing they will see yes 100 of that quantity was produced. Finance and accounts will know yes 100 of that quantity will was produced. Stores and inventory team will also know that yes 100 of that quantity will be was produced today.

So, everybody sees that same figure. So, no question of different information being you know with its common sales will say production so, yes I produced 100. Sales will say no you did not produce, I need not get when I went to the stores I saw only 90. So, all those things are now passed, they are forgotten; we do not now talk in those languages anymore.

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So, here is synchronization of company function like I was talking finance is at the center purchase. Now, what it shows by this by simple you can see by the picture the gear wheel; if one of the wheel is rotated, every all other gears are wheels also moving. What it means that mean manufacturing say is rotated; that means, I create I produce 100 quantity. What is happening? Finance is also impacted because for that 100 such amount of money was spent because so much material was consumed.

So, accounts money gets dividend from certain accounts from material account. So, much material was consumed. Sales, gets impacted because they come to see 100 of finished product in the stock. So, their stock which was probably 50 previously you

know 100 gets added. So, instead of 50 now they see 150. Purchase for them they see that so much material was consumed; so, that much of material stock level has come down, has got reduced in their inventory.

So, in the stores department they need to replace those material for further production because the production is going on every day. So, they need to replace those material that has to be. So, they have to place fresh order to the vendor that replaced so much of material because that has much has been consumed today.

So, one action one data point from one any one department will trigger make every departments values change. So, that is why I am showing this figure with wheels if I if you just rotate one of the wheels all the wheels will also rotate. So, they are getting impacted. So, nobody is isolated, you are integrated. So, one action by you any one department will impact immediately other departments. So, that is what builds in transparency to the system.

So, so, it is also against I had some other connotations like if you do a mistake, an error then everybody else will also come to know the error. Suppose, instead of 100 when you are entering the data, how much did you produce? 100; say you add one more 0 by mistake; instead of 100, you type 1000. The entire company will come to know that a 1000 material has been produced.

But you actually produced 100; we actually consume material for 100; net quantity, etc.; and the sales also will, know that; but what will happen; the purchase will see in the view; material for 1000 quantity has been consumed. So, they will immediately trigger bigger purchase order to the vendor. So, much material 10 times more materials got consumed, supply me immediately more.

The sales person will see that I had 50, now I have got 1050 material, ex stock what do I do it so many material? I need only 150. So, he will start looking for new orders, new customers. So, if you can push the sale and after a day or 2 people will realize that was the whole thing was a mistake. But, maybe by that time some damage has been done maybe purchase department has released some purchase order to the vendor to supply more material and maybe the vendor has also supplied that material.

So, that is another problem with integrated systems, if you do a mistake; the mistake also gets you know spread out everywhere. So, you cannot isolate your mistake, you did a mistake previous days he had entered something in your note book, register and you realize maybe next day that was mistake you cut it and change it; not much of damage done. But, in an integrated system it spreads out everywhere.

Now, just imagine if the company was global, worldwide see the extent of damage; the worldwide does the information will get spread out that this particular the wrong information and then recovering from that mistake becomes another big challenge. So, bigger the organization, bigger the problem.

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Enterprise Resource Planning.....present

... synchronization of Company functions...

**Question** – When, Manufacturing happens, how do Purchase, Sales and Finance get impacted ?

An integrated suite of business applications, which..

- ✓ Closely links, monitors, and controls primary enterprise resources like manpower, machine, material, methods, market and money
- ✓ Enables corporates to readily change their processes to adapt to the ever changing business scenario
- ✓ Provides expertise in industry specific business processes

So, for everything there is I mean there are lot of advantages pluses, but there are also you know some things which you have to take care of that is why you need adequate training. So, everybody needs very training. So, enterprise resource planning one of the thing we complicated thing about implementation is proper training for all employees. So, that is why many employees give that resistance to ERP because they know they have to learn a lot of things.

And, if they do a mistake, just once you press an ‘enter’ on your computer keyboard; done; the information goes out to everywhere. Synchronization of company functions; it is a question when manufacturing happens how do purchase, sales and finance get

impacted? I have already explained that in the previous slide. But, you can also you know do some more reading and thinking.

An integrated suite of business applications which closely links, monitors and controls primary enterprise resources like manpower, machine, materials, methods market and money. So, that is again another major thing what the ERP is actually delivering. It enables corporates to readily change their processes to adapt to the ever changing business scenario and provides expertise in industry specific business processes.

Now, here this needs a bit more explanation that is these ERP softwares they come we what we say is loaded with industry best practices. Now, what is it means that this SAP is implemented same SAP product is implemented in say let us let us talk about say automobile companies. So, let us talk about some big automobile companies like General Motors, Mercedes, BMW, Toyota, Honda etcetera across the world they are also using SAP most of them.

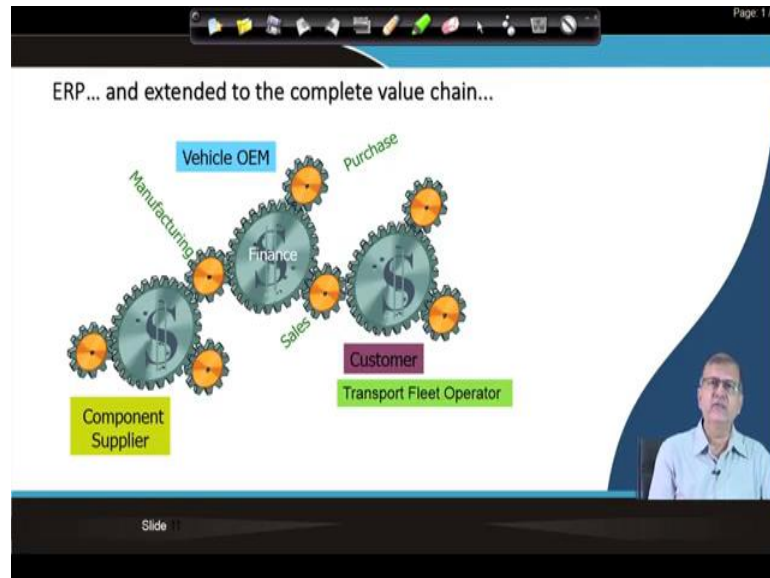
Now, when we here an Indian company auto company say it for example, Maruti also wants to use SAP they want to implement, now if the SAP product is always evolving. So, they are capturing the best business processes which are being used by those large successful automobile companies like say for example, Toyota and Mercedes. Now, when a Maruti buys a SAP and wants to implement then SAP will tell Maruti see here use this particular business process.

Because your process is not what I am saying and what I am saying is a business process which is being used in Toyota and you know how successful Toyota is. So, if you use those processes you can also perform better. So, that is what is known as the best practices. So, it provides expertise in industry specific business processes. So, this is another major feature of ERP product or SAP product. Again I will talk about it also in details later whenever the opportunity comes.

But just be aware you must be conscious or aware of the fact that these products get enriched everyday by the experiences gained in large successful multinational companies. And, whenever we buy that same product here in India and other countries we get that advantage of that particular knowledge. So, that particularly whatever knowledge is in acquired in those successful companies also get transferred or transmitted to us when we buy or use this same software.

And, that is why no wonder these softwares are sometimes you know quite expensive because bring in lot of additional value.

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And, this these are the informations which you will not get anywhere. This is another view of the ERP which is extending it to the complete value chain. So, you have at one end on the right here the customer and say this is an example of a vehicle OEM like say for example, Tata Motors or Maruti or Tata Motors making trucks. So, at the one end you have the customers say transport fleet operator and the other dimension on the left you have your component supplier.

And in between in the center is of course, said the vehicle the truck manufacturer say we can take a name Ashok Leyland or Tata Motors. So, and everybody their large customers and their vendors are also very large, they also have their own ERP systems. So, not only Tata Motors has SAP he say transport fleet operator or say some state transport corporation they also have SAP, they are buying a lot of buses. For example, Maharashtra Road State Road Transport Corporation.

And, say a battery supplier say Tata Motors is making so many thousands of trucks and so they need batteries. The batteries being supplied by Exide for example and Exide have their own SAP. So, all these ERP systems can get connected. So, when you release a purchase order from say release a purchase order for bus from Maharashtra State Transport Corporation through the ERP it is creating a purchase order on Tata Motors;



deliver 100 buses, that immediately flows into the Tata Motors SAP system as a sales order, that sales order from MSRTC for 100 buses.

Now, that when they do their planning, they do the MRP we will talk about later Material Requirement Planning, the bill of material is exploded. And, then 100 trucks you need 100 batteries see that again through that it creates a sales order for 100 batteries on Exide Corporation or Exide limited. See in the Exide limited system in the ERP they receive a purchase order or they receive a sales order for 100 batteries.

So, you see where bus order triggered from a state transport corporation on a real time basis in online that 100 batteries order comes to Exide all instantaneously. It does not take any time; no and no human intervention. The system is taking care of the whole thing because the systems are all connected. So, that is again another you know strength beauty whatever you say about for things like ERP and integrated information system.

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Problems with Information Silos

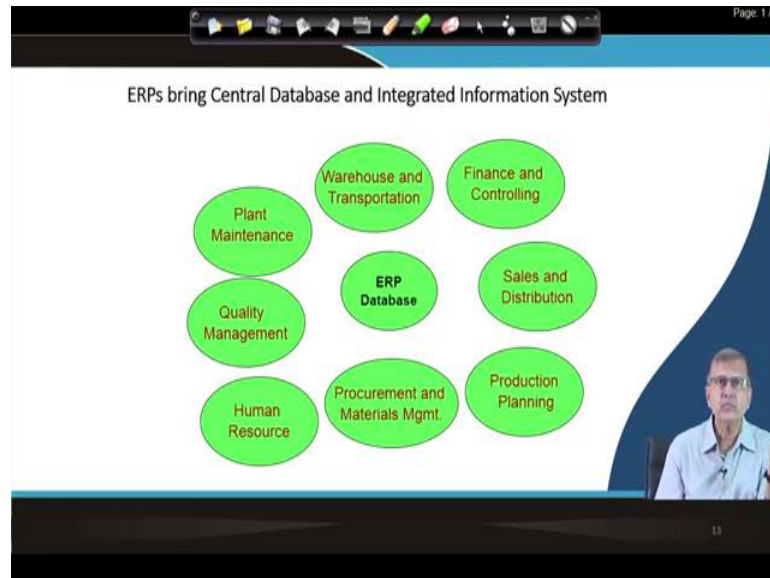
- ✓ Duplication Of Data and chances of making mistakes
- ✓ No Integration between different Systems
- ✓ No online updation of information
- ✓ No real-time availability of information
- ✓ Multiple data entry, increase possibility of making mistakes
- ✓ Different 'naming' conventions in different departments.

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Now, the problem with information silos these are some of the standard problems we have with information silos. Duplication of data, I had said mentioned earlier change chances are making mistakes. No integration between systems, no online updation of information, no real time availability of information, multiple data entry increases, possibility again of making mistakes because you have to enter data several places same data you can you know humans can make mistakes.

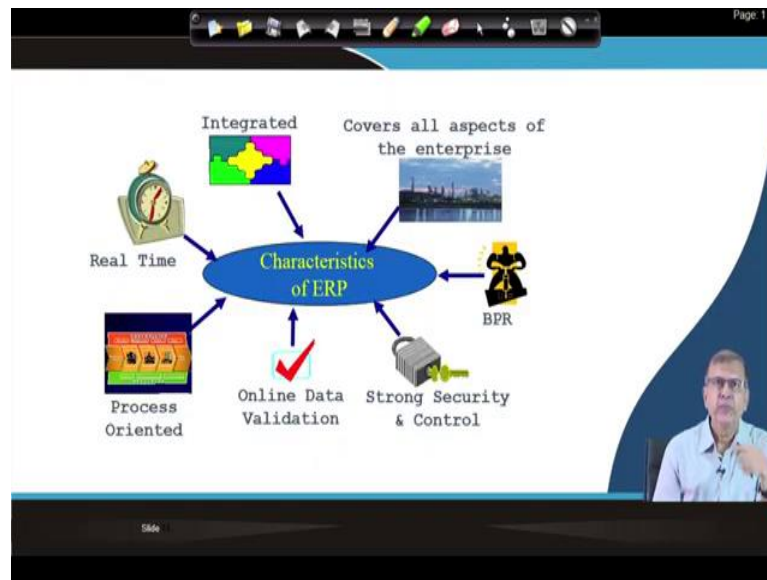
So, if you best is to may enter data only at one place. So, that you can avoid all these problems and different naming conventions in different departments; as a same material which is used in multiple departments can have different nomenclature. Sometimes these things happen when things are not integrated system. So, ERP again it is all about integration, the whole software is an integrated software.

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ERP brings central database an integrated inference system, I think we have discussed all these that ERP data we say the center and all the other functions is surrounding, it maintenance plant maintenance, quality management, human resource, procurement, production planning, sales and distribution, finance and controlling, warehouse and transportation. You name it all the functionalities, they are all connected to the central ERP database and that is how the whole system works.

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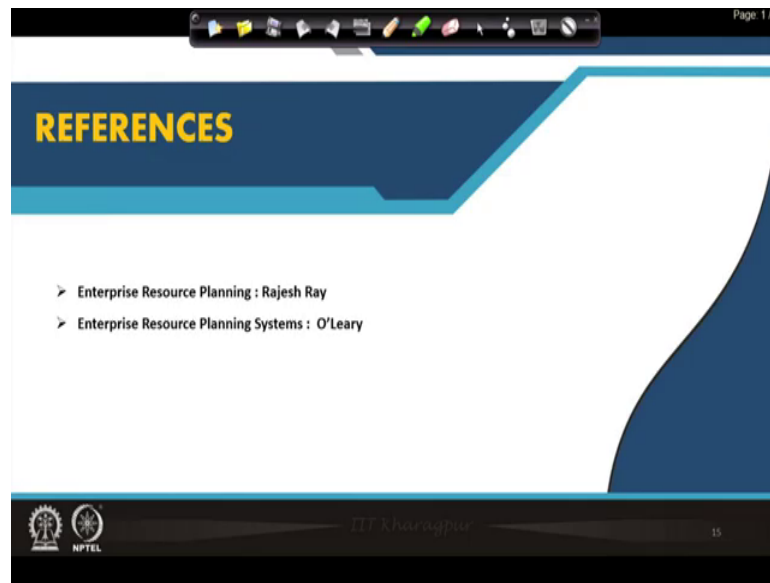


And, these are the some of the features of the characteristics of ERP, it is integrated I have already discussed. It covers all aspects of the enterprise I have discussed. BPR I also partly discussed, BPR is nothing, but Business Process Reengineering that is when I was talking about those Toyota best practice Toyota of Mercedes etcetera. And, when you buy a use an ERP, SAP since Toyota is also using SAP you can get whatever processes have been developed by Toyota into yours business processes, not the physical car making process.

But the business processes, you can get those best practices also implemented in your organization. Real time we have discussed real time here we have already discussed the beauty of real time, process orientation we have discussed that how things are all process oriented; not my functions or departments, but process. Online data validation that is a typical advantage of any central database software, where when you enter something value it can get validated and many fields can get online data validation.

So, that your chances of making mistakes again is further reduced because now you are using a software, a sophisticated software, very expensive software. So, they use lot of data validation. Strong security and control, now in any IT system security is a major concern. So, it has to be you know virus and all that stuff then hacking and these ERP softwares have got very good security and control.

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And, this is the reference textbook; 'Enterprise Resource Planning' by Rajesh Ray and 'Enterprise Resource Planning Systems' by O'Leary; very common text books, good ones, simple to; easy to understand, etc. So, these are recommended for your course.

Thank you very much!