Course on E-Business
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Module No 02
Lecture 10: Enterprise Resource Planning

Welcome back. Today we are going to discuss about enterprise resource planning software. Enterprise level information system. So if you remember, in the earlier lectures, we were discussing about business process automation. We know that businesses consists of 4 major functional areas. Typically, 4 major functional areas. And what are they? 1st one is your manufacturing and operations, 2nd one is your sales and marketing, 3rd one is your finance and accounts and 4th one is your human resources.

Now we also know that when we talk about business processes, specifically intra-organizational business processes or internal businesses processes, there are 2 types, one is the functional the businesses processes which happen entirely within one functional area. We have 4 functional areas remember, we have 4 functional areas entirely within one functional area. Let us say Accounts Payable is within one functional area that is your finance.

So there are business processes which are within the functional area, there are business processes which spans over many functional areas. So now if you would like to automate the business processes, internal business processes, see what is e-business? E-business is about automating both internal and external business processes, intraorganisational and interorganisational processes.

Now when it comes to within organisation internal business processes, if it is within a functional area, let us say finance Department, it has to maintain its own database, it will carry out its business, automated business, there is no doubt about it but suppose you would like to integrate with another functional area which again exists independently, how exactly you have to do? The nature of the data, the data replication will take place.

Connecting to heterogenous information system, there will be problem. So therefore one of the solution to automate this internal business processes across the functional areas is enterprise resource planning software.

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So in this lecture we are going to learn what exactly is this ERP. Typical business functions business processes supported by ERP, support for cross functional business processes, then what are reported benefits of ERP and what are various implementation cost components of ERP and what are the causes of ERP failure and what are the recent trends in this enterprises resource planning software.

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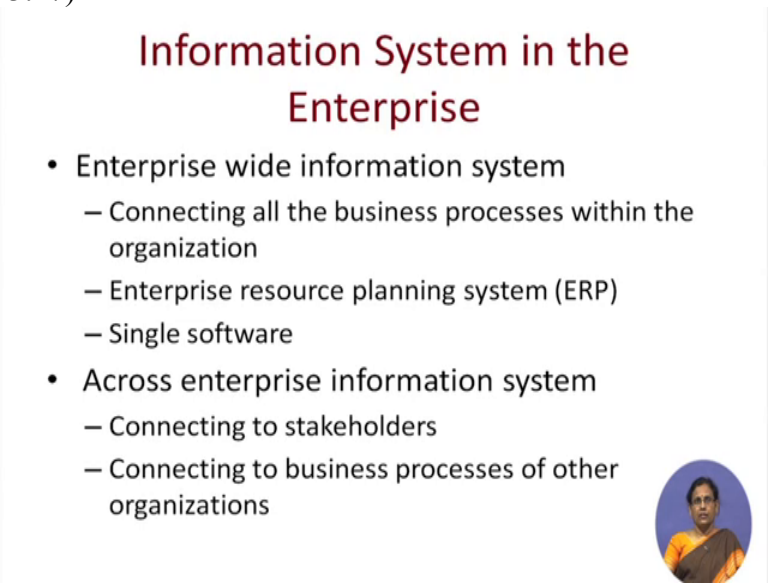

Enterprise resource planning system is a kind of enterprise wide information system which connects all the businesses processes whether it is a belong to a single functional area, whether it

spans multiple functional areas, it helps in automating them. Then it is actually different from across in enterprise information system which connects the stake holders. In fact, in ERP you should have provisions for connecting ERPs of other stakeholders possibly or to the systems somehow getting the data from other stakeholders but external stakeholders are not part of ERP.

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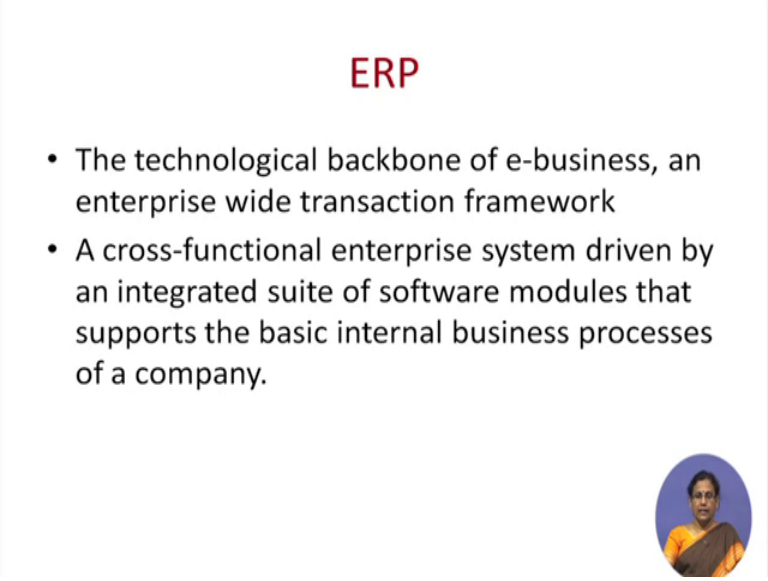

So ERP is basically called as a technological backbone of the business. It is an enterprise wide transaction framework. It is a cross postal enterprise system driven by an integrated suite of software modules that supports the basic internal business processes of a company.

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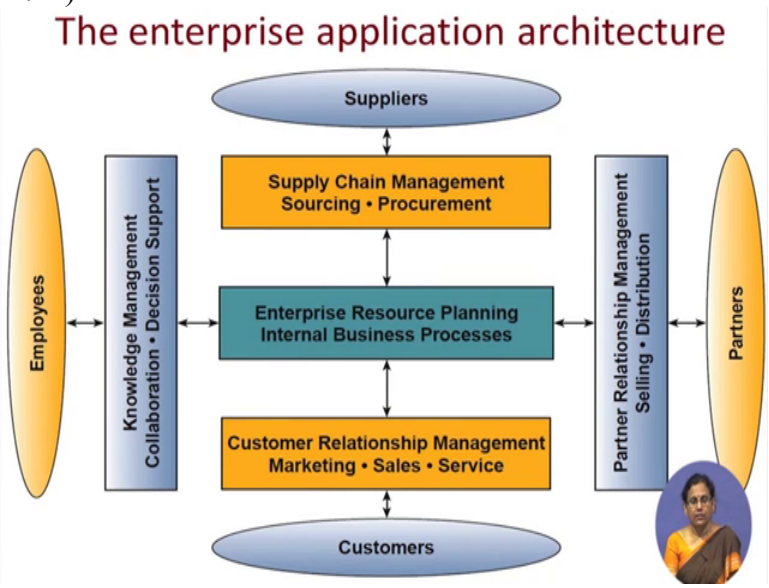

If you look at this diagram, here is your ERP which is for internal business processes but when you connect to your external stakeholders like suppliers or customers or other, your supply chain partners, you may have certain intermediate software, let us say for procurement, you can have e-procurement system, for supply chain management, you can have supply chain management system, for customer relationship, you can have a system as well, for sales and marketing, you can have another system.

But all of them might be exchanging the data with the enterprise system but they exactly are not the part of enterprise system. Why? Mostly because of you know you may not allow your other entities, for security reason possibly, you will not allow the other entities to access this, your internal business processes.

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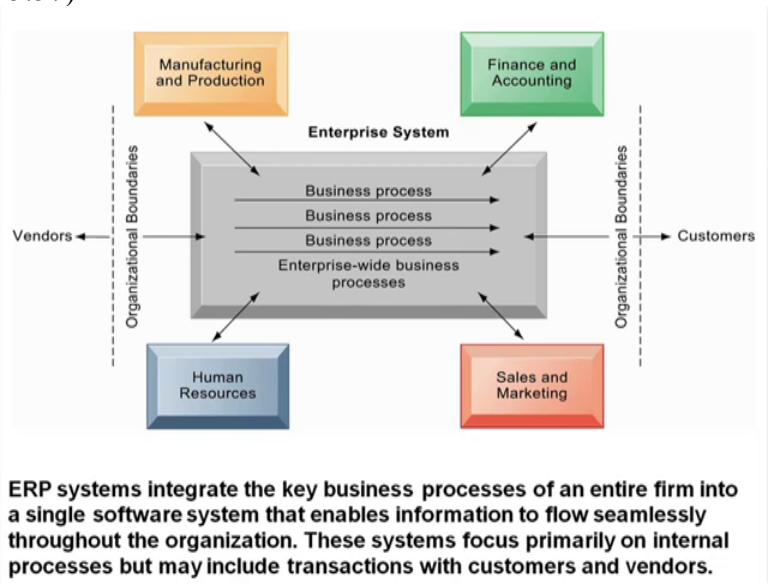

ERP systems integrate the key business processes of an entire firm into a single software system that enables information to flow seamlessly throughout the organization. These systems focus primarily on internal processes but may include transactions with customers and vendors.

So ERP system integrates the key business processes of an entire firm into a single software system that enables information flow seamlessly throughout the organization. These systems focus primarily on internal processes but may include transactions with customers and vendors through another interface which is which is exactly not enterprise system ERP system but ERP system gets data. For example, in a customer relationship management software, your ERP system will be getting data from there but it may not be exactly the part of ERP system.

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So basically as I told you, organisation has 4 major functional areas and under each functional areas, you can have many many functional business processes and many cross functional. For example, under this finance and accounting process, you can have general ledger, Accounts Payable, Accounts Receivable, fixed assets, cash management and forecasting, product cost accounting, cost centre accounting, asset accounting, tax accounting, credit management, and financial reporting.

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Similarly, under manufacturing and production processes, you can have procurement, inventory management, purchasing, shipping, production planning, production scheduling, material requirements planning, quality control, distribution, transportation, execution, plant and equipment maintenance and so on.

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Under human resources again you have many functions like personnel administration, time accounting, payroll, personal accounting, benefit accounting, application tracking and many other things. Under sales and marketing processes, you can have order processing, getting quotations, contracts, contract management, product configuration, pricing, billing, credit checking and so on.

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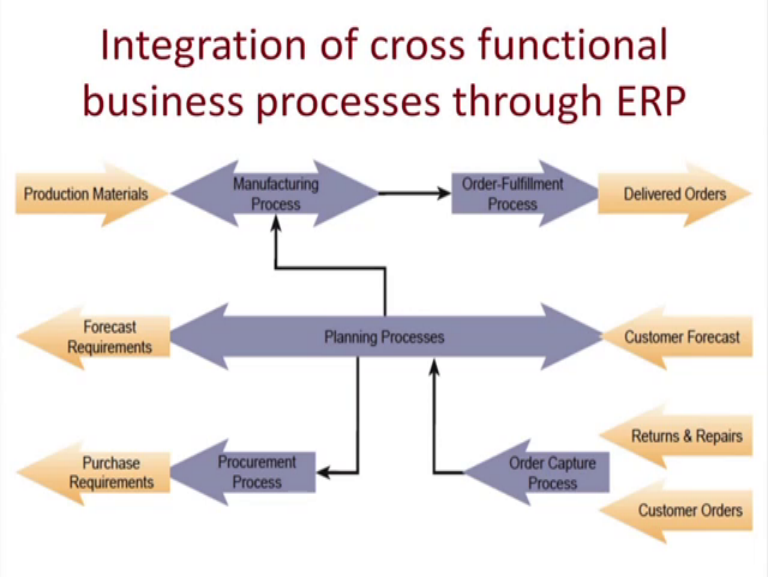

As I told you, it is not about automating the business processes within a functional area but it is about automating the cross functional systems as well. Again this is one example of that order processing which is a cross functional area where you have inputs, I mean the inputs going, moving among various subsystems. The 1st one is for capturing the order which is from your sales sales subsystem and it goes to your operations where the planning takes place and again it goes to the manufacturing processes where the production takes place.

Then it goes to your distribution department and so on. So ERP helps in integrating this cross functional business processes. Now the question is, how does it make this integration?

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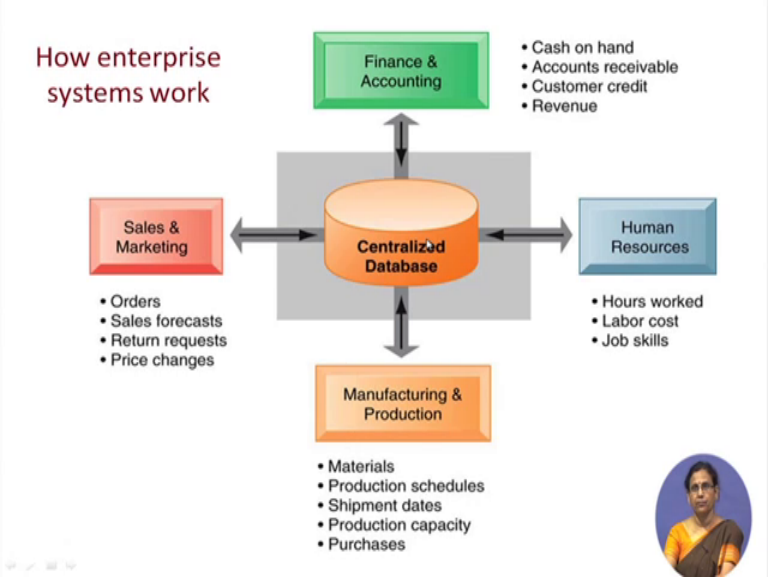

This integration is basically possible through the help of a centralised database. So the problem that I was telling in the beginning of independence existence of these 4 subsystems is the data replication. So once you have a centralised database which is accessed by each subsystem, for example that consider about that order processing. Your order data through sales and marketing subsystem entered to the database which is accessed by finance Department, which is also accessed by manufacturing Department and so on.

So in this centralised database, not only the data about the entities are stored, the data about how to manage the workflow containing various business units, workflow basically is the flow of as I have told you, your business process workflow actually is the flow of information. Material, money part we are anyway not considering right now. It is the flow of information among various business entities.

So, maintaining how the business will flow, who are the entities, who are the stakeholders involved in between, that is also taken care of by the program and this centralised database. So this centralised database, this ERP is basically the centralised database and a set of programs which work on this centralised database to make this business processes automated.

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Now what are various reported benefits of this? There is improvement in quality and efficiency of customer service, production and distribution, there is reduction in terms of transaction processing cost, hardware, software and IT support staff, there is cross functional information flow well, so therefore better decision-making is possible. Then it is actually because the information comes from various sources and it is accessible to various entities, almost every entities in the organisation, of course it is not that every entity will be able to access every kind of information, depending on the role, there will be access control.

So based on their role-based access control (())(11:51) but suppose see it is no more now a person oriented. Because this information is available and let us take a very simple example, suppose one manager is of purchase Department is absent for a very long periods because of let us say some medical reason or something and in his place, somebody else is coming, because information is available in in an integrated manner in the ERP system, the person who is replacing replacing him can get hold of this information and can actually make the decision with this available information.

So therefore this organisational structure has now become agile. This can change agile. So these are some of the reported benefits of ERP system.

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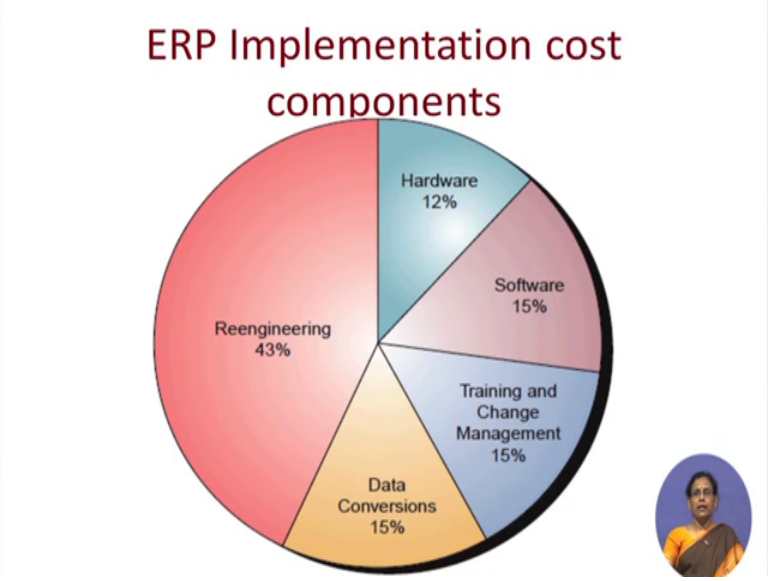

Let us see what are various ERP implementation cost components. If you look at this diagram, major part of the investment for let me tell you one thing we did not discuss earlier, ERP can be either developed in-house or you can have a ready-made ERP software purchased and installed. Now when it comes to getting a ready-made like that of SAP, what a ERP software does?

ERP software actually automates business processes. Now business processes are unique for each organisation. Let us say a simple order processing that a typical example we have been saying for so long, simple order processing, the steps involved in the simple order processing might be different in different organisations. Overall, it maybe you know same, it comes from sales Department and finally the order is dispatched to the customer but internally, the information flow from one internal stakeholder to the other stakeholder, one employee to the other employee, one department to the other Department, is actually different from organisation to organisation.

If the organisation goes for developing its own ERP, it might be looking lucrative because you actually do not have to change your business processes. Business process can be automated as it is but there are other stuff as well. If you do not go for a ready-made ERP software, you may not be able to realise as an organisation, you do not have the expertise once in your lifetime of the organisation, you will be developing your own internal ERP system.

But if you buy one ERP software from a established software vendor, in fact all the functionalities that is there in ERP system, you are going to get which your organisation, your IT staff within your organisation, they may not be having that knowledge because they are doing it for the 1st time. But getting those vendor made ERP software, again comes with certain problem. What is that problem? Because the software implements various business processes, the process that is implemented in that ready-made vendor made vendor provided ERP software may not be exactly like that of your own organisation.

So therefore, when you get the ERP system, the major task is reengineering your own business processes to fit to that ERP system. So therefore, in fact not only the ERP vendor but you need to hire a consultant who can help in reengineering your business processes to suit into the ERP system.

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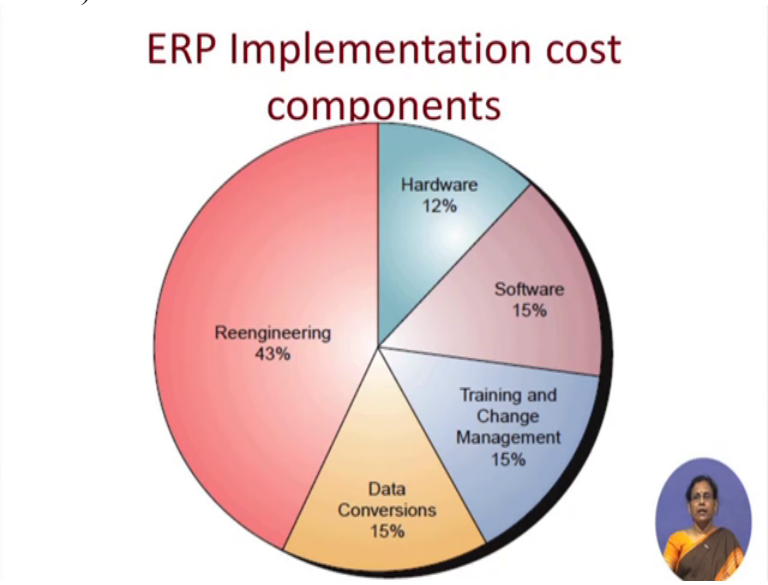

In fact, maximum of your investment goes for reengineering. Then there is hardware costs, you have to buy servers and all and high end systems for maintaining your data, ERP software itself.

Then another chunk of data is for data conversion. Now what is this data conversion? Before ERP, you were having subsystems which were computerised and were existing individually and they might be keeping the data in different forms. Some might be keeping in in let us say Excel

sheet, some might be keeping in Oracle database, some might be keeping in some other form. Now 2 major issues come here for data conversion.

There can be either problems in the, there can be both semantic problems, there can be problems in the technical format and so on. For example, let us say if your data, somebody storing in Excel sheet, somebody is storing in Microsoft access, somebody is storing in Oracle, somebody is storing in something else. Now internally, how this data is represented is different in all the software. So that is the technical part of it.

Then there is a semantic part of it. Suppose a part number, you are storing the part number. Part number, uniformly you might be having throughout your organisation let us say some part X is called P111, it is part number. But in the Excel sheet when you store this data, the column, name of the column might be something else. And in some other subsystem when you have this data, name of the that particular column might be something else.

So there will be semantic dissimilarity even if it is the same data, semantic dissimilarity will be there. So to resolve both these technical as well as this semantic issues you need a lot of effort which in turn requires money. So you have money for data conversion. Now the people who are actually using this new software, they must be getting trained and there has to be change management happening within the organisation, that again consume some amount of money.

So you can in one of the earlier lecture, I was telling you what is the role of information in reengineering, you can really now understand what is the importance of reengineering. It consumes so much of cost. Now there are various though we have so far we have been given we have been talking about the benefits that comes out of ERP, actually many times, in many of the ERP projects fail because of you know because of lack of experience in because of various reasons and that is due to lack of experience and internal factors which actually makes the situation not favourable for getting the full benefit of ERP. In fact many organisation has have implemented ERP but are partial using it and they cannot realise the full potential of ERP.

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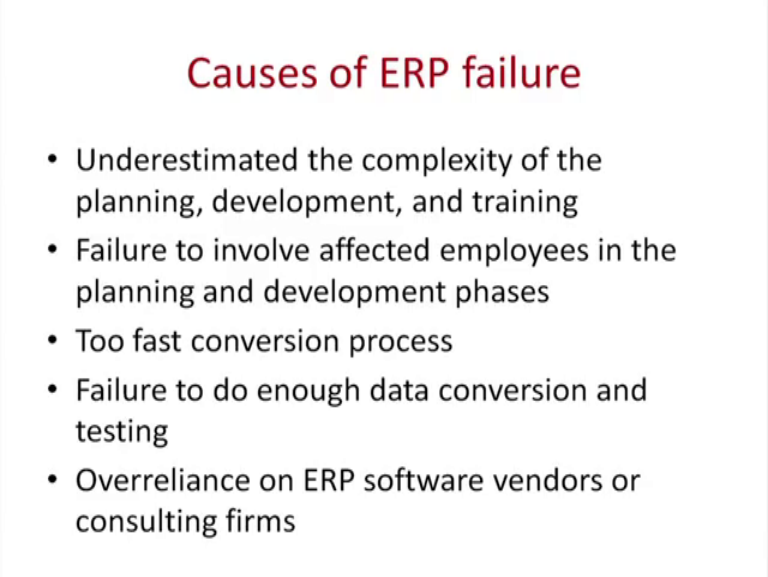

And what are the reasons? 1st one is underestimating the complexity of planning, development and training. What is this planning, development, training? As I told you, you can actually develop the system internally by your IT department or you can have the system you can have a ready-made system. Whatever may be the case, in case of in case you develop it internally, you have to understand all your business processes existing, you have to see that whether they are optimal or not, you have to re-engineer them.

If it is not not already done, then you have to be specifically careful about your cross functional business processes. And in case of your vendor made ERP, you have to re-engineer. So if you actually underestimate from the beginning, underestimate the complexity involved in planning and planning and development, reengineering and training your employees for using system, then your ERP fails. You have to plan accordingly.

The 2nd cause for ERP failure is due to lack of interest of the management for involving the employees who will be affected by the adoption of ERP. If they are not involved from the beginning, there will be a lot of resistance from them and their learning process will be slow. Then the next reason for failure is fast conversion of the process. By fast conversion we mean, when you are going to implement ERP, that does not mean that you did not have any computerised system.

For example if you remember in one of the earlier lectures, we were talking about the procurement adoption at Tata steel, in fact in some subsequent lecture, after few lectures also we have to have a detailed discussion on that. When they went for ERP implementation, they had already their data maintained in some existing databases. So while converting to ERP, cannot complete, your organisation cannot completely go blank.

Organisation has to run. Your organisation has to run with the existing system. In fact, after you implement ERP, you should be parallely running it with your existing system to see that if your business processes are properly mapped or not. So if you have a big bang approach and if you have a too fast conversion, you may fail. Then the 2nd one is if your data, insight just now we have been talking about data conversion.

If you do not put enough effort for data conversion and testing, you may fail. And once your users are the see users when we are talking about the information system users, there can be specialists, there can be end users. Specialist understands that what is the technical difficulty and how to they try to overcome it but end users, you cannot really convince them. They will lose faith on ERP.

So that is another reason for failures. Then the last one is actually very peculiar. If your overreliance, because you know this ERP vendors and the consulting firms which will help you in ERP implementation, all of them might be giving a very rosy picture of, about the ERP but as we have discussed, it requires a lot of effort on part of the organisation to actually have its own business process study, take its own people into confidence and so on.

So if you only rely on ERP software vendor or consulting firm, many times, the organisations fail for ERP implementation.

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Now let us have a look at what is the trend in this vendor made ERP. 1st one is your flexible ERP that I have been talking so far. By flexible ERP we mean the vendor made ERP which comes with its own business processes. You have to map your own business processes to the vendor made ERP or vendor made ERP need to be customised in the best possible manner to your own business process. So this this was the fastest.

In fact this your SAP, R/3, et cetera comes under this flexible ERP. Then right now I would like to add one more thing. Initially, this ERP systems used to be only client server based systems. By client server based system we mean it used to be a two-tier system where there used to be a server and you have to make client terminal through which ERP could be accessed. But this two-level architecture later got changed to web enabled ERP adding a 3rd web interface layer.

So which means, it is no longer need to the accessed through the the terminals in this client server based system. There will be some web interface associated with it. In fact, when we talk about various technologies, we will be learning about this 2 tier and 3 tier architecture but it is web enabled. So once it is web enabled, at least we know that it can be accessed now from any part of the world if you have access to the software.

Then, certain vendors went for interorganisational ERP. If two organisations buy from the same vendor, two partner organisations buy from the same vendor then some of the inter organisational

business processes can be aligned, this is interorganisational ERP. Then the next was actually e-business suits. By e-business suits, it came with interfaces which can actually connect with many of the external stakeholders. Then now, the ERP has moved to cloud and many vendors, your SAP, the Microsoft, Oracle, many of them have now started moving to cloud where you do not have really maintained your own infrastructure and data.

The vendor itself takes care of your infrastructure and data and that is how, not only large organisation, even they imagine that small organisations can be connected together to reap the benefits of ERP.

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Now let us look at some leading ERP solution providers. Of course, SAP I have been talking so long. SAP R/3 is the software for ERP software for large organisations and they have many varieties, in fact, if you go through the website, you can find out. Though I have noted here few, in fact along each of this ERP solution providers, you can find out many different types of ERP solutions. And these ERP solutions are made for different sized organisations, different category of organisations and so on.

Some even provide for academic organisation ERP solutions, some specifically for manufacturing organisation and so on. And here, I have read about this SAP, look at this SAP, R/3 for large organisation, SAP business one is for medium, these SMEs, small and medium

scale enterprises, then this S/4 HANA is actually a cloud-based solution ERP solution by SAP. Similarly oracle's e-business suit, Microsoft's dynamics and Infor's global solutions are some of the examples but this is, the list is not exhaustive, there are many.

So with this lecture, we have actually discussed about automation of internal business processes which are within the organisation both functional as well as cross functional using enterprise software system enterprise resource planning system. Now from next class onwards, we will be talking about how to connect to external stakeholders and various solutions for that. Thank you very much.