Management Information System
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Lecture - 01
Introduction – I

Welcome all of you. Today we begin our subject management information system. management information system to begin with you can see that we have the modern organizations that are open systems that exchange information continuously to adopt to the changes imposed by rapidly changing technology and market and they need right information at right time and the information need be gathered, organized, processed, evaluated and presented in proper form and transmitted.

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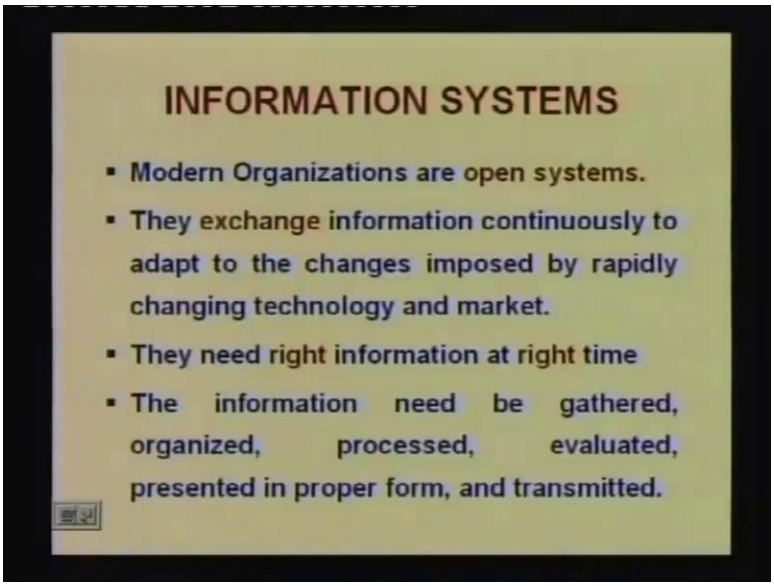

So essentially what does it mean?

It basically means that if we really think of today's organization the first and foremost thing you can see that the organizations have to be open. Basically here the open system essentially means that the organizational system they should be opened to the environment and they should continuously exchange your matter, information and energy between the organization and the environment.

So, in in information context basically the idea is that when we know that basically every organization has to undergo change and this change is imposed by technology and market situations and if an organization does not exchange this information on a continuous basis the result is the information the organization really cannot prosper. So a very vital component of any organization is that they must have right information at the right time. But as we all know that simply obtaining information is not enough the information has to be gathered, organized, processed, evaluated, presented in proper form and finally transmitted. So that is the basic necessity.

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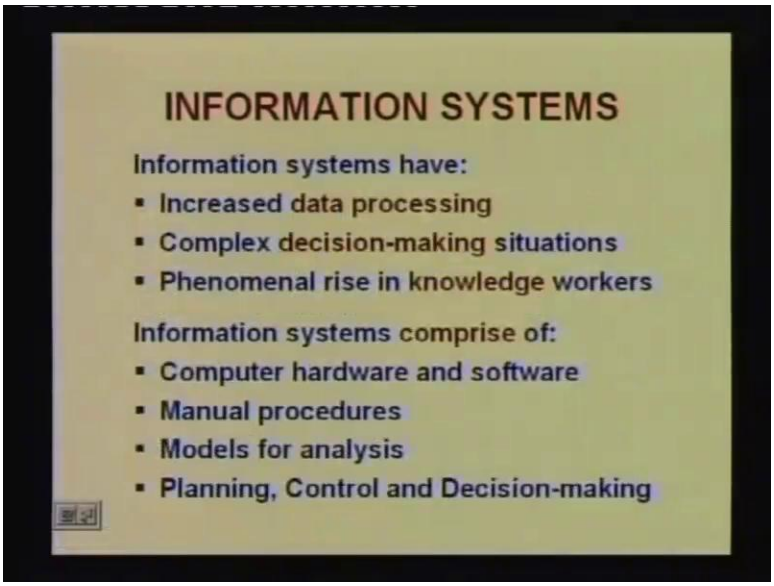

Beyond that we can also see that the information systems of today we have increased data processing, the decision-making situations are complex day by day and there is a phenomenal rise in knowledge worker. So what is happening, as the business is becoming more and more complex the data processing needs are more so we need more sophisticated hardware, software, networking equipments, the decision-making situation are more complex, we require more complex analysis of the decision situations and there is a phenomenal rise in number of people who are no more simply doing operational work they are basically doing what is known as knowledge work.

Now what is knowledge work?

We shall look at it later on as we move on. At the present moment let us try to see what the information system comprise of.

The information systems has got essentially computer hardware and software, manual procedures, models for analysis and planning control and decision-making components. So these are the basic elements of information system.

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But apart from that there are a number of issues which has made the information processing or for that example for that matter the matter of management information system more complex than ever. These issues are first of all globalization. The globalization issue essentially we all know that the organizations of today they have to compete not only in the local environment in the local market place but also they have to compete in a global market place and they have to compete in the world market with the global work groups with the global delivery systems. So this is only possible when the organization has a global view rather than a local view like we all know that thinking locally thinking globally and acting locally. So you may act in a local environment but your thinking should be global. So that is the first issue that has made the business environment more complex.

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The second issue is the transformation of global economies. The global economies have all changed the knowledge and information based on the major thing. Earlier it was more of think of materials, think of delivery systems, think of physical flows today more of flow of knowledge flow of information they are more important issues of today.

The second is the issues of productivity. So if you are not productive if you are unable to compete in the global market place and you are really not able to survive so that is the most important thing. The third important issue is that new products and services. If you do not upgrade your product life cycle in a continuous basis you are unable to compete in the market. So you all the time you must have new products and new services.

Leadership: there should be very good leadership from the management point of view. The time based competition you have to compete; not only compete but you should also know what is the right time when you should introduce the new technology and if you are unable to do that on time, even if your technology is good, your product is excellent you will not be able to compete in the market.

Shorter product life: that means earlier if you have a good product you can think that okay for the lifetime you can continue this product; today it is no more possible. Sometimes in information technology products the obsolescence rate is so high that in 3 to 5 years' time you will see that the product is obsolete. For example look at these languages: we had this Fortran, C, Cobalt these type of languages, today rapidly the object oriented languages have invaded the market and you cannot really sit tight and say that we have this product and this is the product; you know you cannot... there will be no change in this.

Turbulent environment: the environment is... every time there are lots and lots of changes because of political, economic and many other changes, the national boundaries are changing all the time. Limited employee knowledge base: see, we see that however good an employee may be the employer only knows one part of the story so you cannot really find a person who knows everything of the total operations of the organization. So really what you have to do is a continuous exchange of information. If one employee knows lot of things, another employee knows certain other things so they should exchange information and you should know that these exchange of information really can never be substituted. So these are some of the transformation issues. Apart from that we have the transformation of the enterprise.

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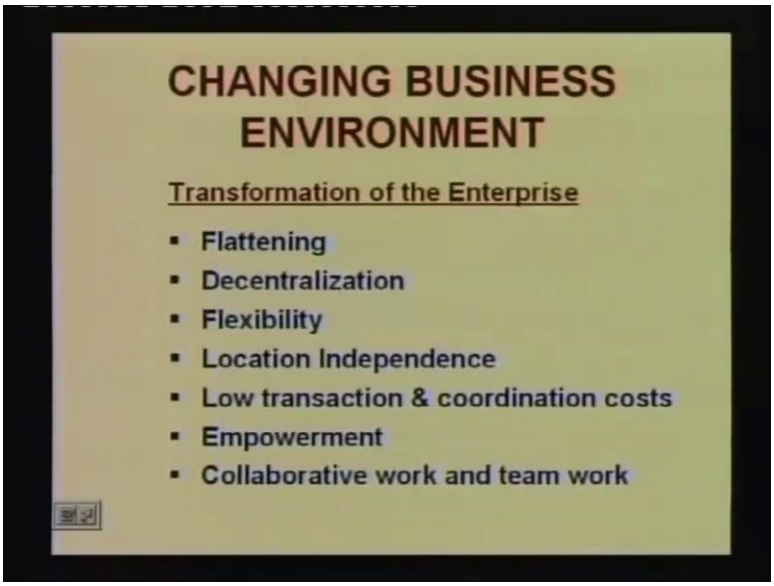

The enterprise is no more the enterprise of the yesteryears. For example, in the old time we had hierarchical military organizations and organizations, manufacturing organizations and other kind of organizations were also based on those kinds of considerations. But today the organizations are flattening; no more you find that you know lot of hierarchy, the hierarchy is reducing, we have hardware matrix organizations particularly in the consulting environment.

More and more decentralization: You cannot have central body controlling every other point. Today's thinking is more of nodal concepts that we have large number of nodes each empowered and each can control a given situation if the need requires.

Flexibility: You you cannot think that in a rigid frame of mind you have to be flexible. You have to think that okay this path is not possible, this method is not working we have to go for some some other method.

Location independence: No more you can say that okay this is the location, you can always think of alternatives.

Low transaction and coordination costs: The costs have to be kept at a very low level otherwise you can never compete in the market.

Empowering people: earlier for example supply chain management we have seen that we are empowering the supply chain by empowering suppliers, empowering our business partners so that we can make a good tie up.

Collaborating work and team work: that means the work is no more individual it is in collaboration and it is within a team. So those issues are you know they have transformed the enterprise. Then how... okay.

So before we go further let us quickly review exactly what we have said so far.

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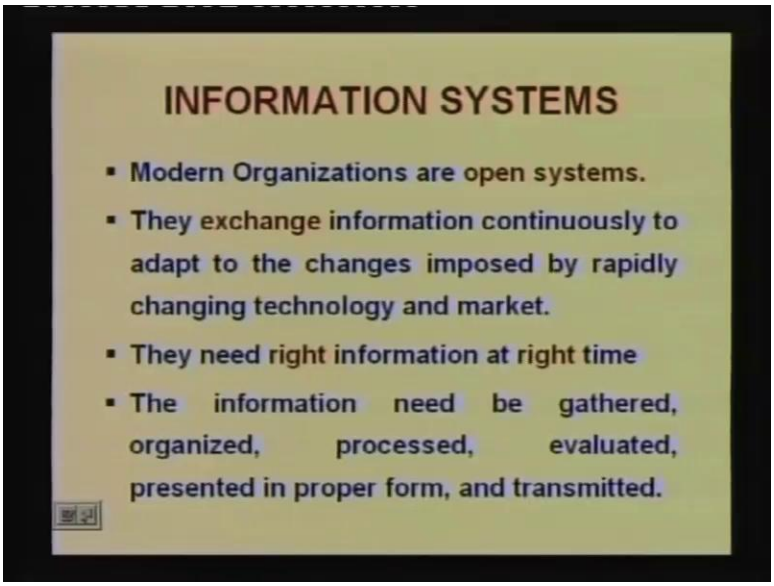

In the very beginning what we said that organizations of today you know... it is the very first slide where we said that organizations are open system and therefore there has to be a continuous exchange of information, continuous exchange of matter energy and why we do this because it is required... because information system tells this...

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It is because the business environment of today has changed; mainly in which respects? First respect is globalization. Globalization has come in and because of globalization the issues are more diverse, we no more can sit on our laurels and we have to see. If we are really doing things in the most efficient manner if we are not doing and if somebody else is doing in a better way we should try to take those issues rather than concentrate on our own efforts. That means if you are not best do not do it, depend on others, exchange; these kinds of concepts have really come in.

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The second information that global economies have changed and you have to have all these like leadership, shorter product life, productivity all these issues have become all the more important in today's context and the enterprise itself cannot be bulky anymore, it has to have flexible... it has to be flattened, decentralized, lean so all these issues have really come in.

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But the main issue is all the time present. That is if you have to do business you have to have information; if you do not have information you cannot remain open system; if you cannot remain open system the alternative to open system is a closed system. That means if you are closed system, if you do not allow matter, information, energy to be exchanged with your environment the result is that you are in a cocoon and the world will leave you behind.

It has happened to many organizations. In the past many organizations which have done very well in the past, today in the changed scenario they are unable to compete, they are unable to really you know keep their name in the market place. So the global joints have died and we have new generation organizations which are doing well.

So, really speaking, apart from that there are two very important issues here: one very important issue is the physical system. The physical system has to be very good, robust, of very high quality, the product should be good, the distribution should be very very nice, the management should be very good but apart from that the physical flow part can be well coordinated, the physical flow part can be well orchestrated only when we have information system a matching information system which is able to provide the necessary feedbacks to the physical system as and when necessary. If this information system is not proper the information system is lacking in

some way or the other which is unable to give the right information at the right time to the right person the system may actually fail. Because you see today the most important resource is information. When you are doing business in a global scale, when you are really trying to do things at a global scale you you just cannot say that you know you just do it by hunches. The hunches are fine but you have to have the information immediately and process it immediately that is where the flexibility should come in.

So what should what sort of you know... it is it just cannot be done informally any more. It has to be a formal, okay some part of it should be informal but the formal part should be perfectly in place. In this particular course that is Management Information System we try to see what are those specific issues, what are those specific needs that are required to build a good information system which can sustain the business, which can sustain the management and which can really make an organization sustainable in the long term. So that is what we attempt to do in this course.

Now, before we go in to the other details let us try to see certain other simple definitions like first and foremost a definition of the information system.

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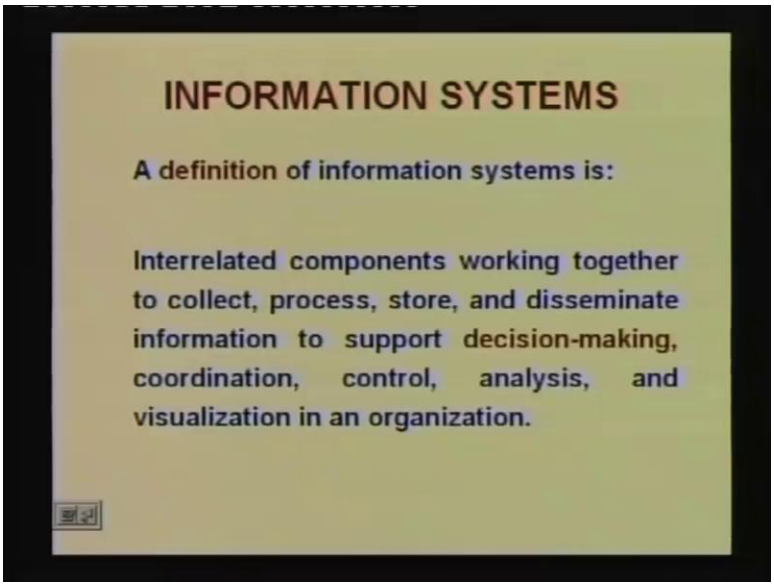

The information system can be defined in a simple way. Interrelated components working together to collect, process, store and disseminate; information to support decision-making, coordination, control, analysis and visualization in an organization. So you can see that there are two three parts: the first part is there should be interrelated components and they should work together; and work together to do what? To collect, process, store and disseminate information; these are all sub activities. But ultimately they should support. The support part is most important, they should not replace rather they should support; decision-making, coordination, control, analysis and visualization in an organization. So it is all about information and how to obtain that information and what use are they going to be to the organizational members. So both the aspects should be very rightly you know bound together.

Now, sometimes we think that information system is all about processing it like collect data, process data that is information. Many a times we say okay process data is information. But process data for what? Process data useful to the recipient. That means something you have processed all right but what use is that? Is it helping in present or prospective decision-making; if yes then we say yes that is information.

An information system is a collection of all those activities like collect, process, store, disseminate and thereafter support decision-making, coordination, control, analysis, visualization everything together we can call that as information system.

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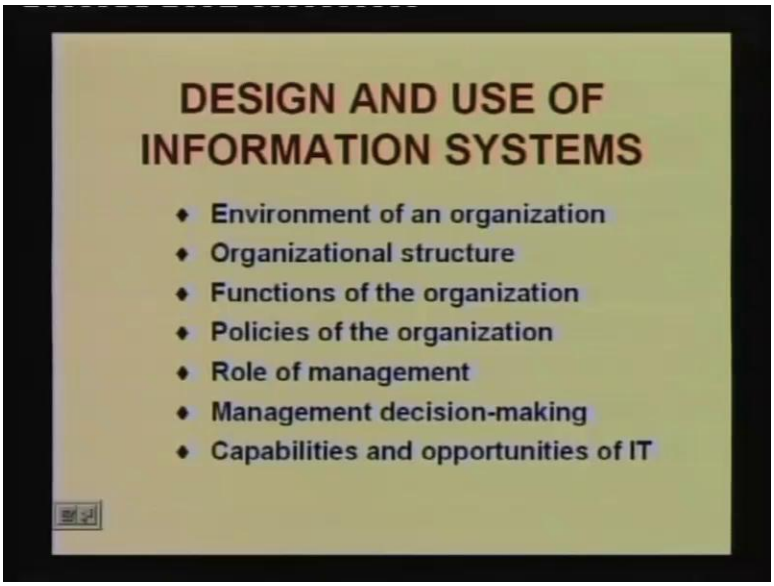

Now let us try to see that what are the designs used I mean design issues of information systems. The first one environment of an organization, the organizational structure, functions of an of the organization, policies of the organization, role of management, management decision-making, and capabilities and opportunities of IT. So these are various issues which we should really think of designing.

See why the design word is coming because whenever we think of information systems we should really observe information as a critical resource. See let us try to explain this in some detail why we call information as a critical resource. Let us say we have a particular organization which is let us say is a distributing distribution type of company which let us say in a in a large area it is operating and its products are really sold or distributed something like something like say a domestic gas or this sort of or industrial why domestic industrial gasoline supply kind of agencies which actually has to move over a distributed area to supply their product.

Now, when this is happening one simple way is simply to ignore the organizational needs and just supply only when customers approach them. So it is as if it is all customers' business let them come to us whenever they require something and we sit tight in our organizations and we supply when they require. So it is more like you know the the supplier is the king. But we all

know in today's world this is no more true, the customer is the king and not the supplier. So, when we have a change over the thinking that okay customer is the king then you have to reach out to the customer, you have to see how you can actually make your business do better by actually designing a better supply for the customer.

The moment this change of mind set has taken place automatically you will see to do well in these kinds of situations; you require information which you were not requiring earlier. You you now require information as to what kind of inventory the customer is keeping, what is the fluctuations that these inventory is undergoing, what kind of consumption pattern exist in a client organization and if so what when the customer or the set of customers will require refill of these particular products. So, if we know that we can solve it as a distribution problem and using this information we can schedule, we can optimize, we can have vendor managed inventory, we can have the inventory routing.

So you know all these optimization we can actually carry out so that we can build an organization or we can build a system through which we can optimize our business; we can gain the maximum possible profit even though we are giving maximum supply or maximum benefit to our customer that will create competitive advantage. That is a very important point. Because, if we are unable to create competitive advantage we cannot be sustaining our business in the market anymore because somebody else our competitor can always come and beat us that is where the major role you know is played by information systems and that is where we have to continuously look at.

So you can see that when you are building an information system these information system should no more sit on the past laurels and think about new way of opening up, new way of doing business so naturally the environment of the organization should change, the organizational structure should change; I mean in the old structure where you are not proactive, where you are not really looking at the customers' business, you are not really opening up the chain, not really trying to build an interactive supply chain system, not interested in vendor managed inventory you also do not have organizational positions, you also do not have organizational functions and policies, the role of management all these things are absent so you have to build them, you have

to build so it is not just have an information system and that is all, it is not that, it is it is something beyond that whether okay information is available can the organization utilize this information, can the organization really make use of this information and if they are able to make use how well they can coordinate their business in the new setting.

So here the management has a big role, they have to make decisions and we should also know what are the capabilities and opportunities of IT, IT really cannot do everything, there are certain things which requires so the management flexibility otherwise you have information you know what to do but you really cannot do you cannot deliver. So, if you cannot deliver there is no point building an information system just for that; what will happen people will really bypass that kind of information system. The information system is in place but nobody is using it. So that sort of situation should be avoided at all possible costs. So these are some of the issues that are important for design and use.

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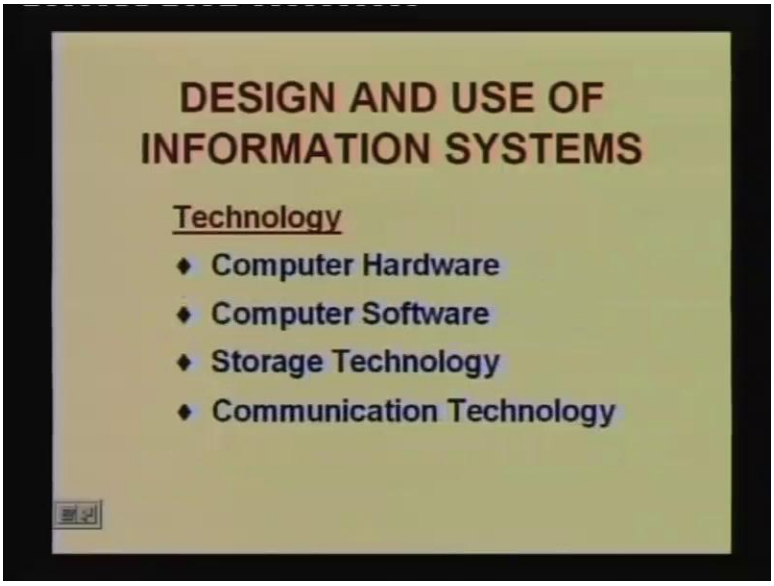

Then we can see that yes some of the other issues like design and use, so some of the things like technology so what are the technology. So we have seen the organizational issues then we have the technological issues, the issues such as computer hardware, computer software, storage technology, communication technology all should really be geared together. That means it is it is not that you just build an organization around the information system, otherwise if you do not

have the correct hardware software and technology and communication even though you wish you really cannot build that kind of an organization.

Say for example if you are thinking of an ERP Enterprise Resource Planning, the basic idea about enterprise resource planning is you know integrated business environment where right from the material procurement to the distribution of materials this material is only one issue but even if you take materials alone right from the procurement of raw material to the distribution of finished goods we have to really connect all the processes in the form of triggers; in the form of triggers essentially mean that do not wait for you know the supplier to supply and wait till he supplies, basically chase it. So whenever you place a purchase order you see that the supply actually comes in and moment the supply comes in the other processes should automatically be triggered. It is not that you know supply has checked whether supply has come and if so then do this, it is not that.

The supply is an event, whenever the supply has taken place it should you know create like a trigger... that is a better word is event driven process chain. So the supply is like an event, when the supply has taken place the process chain the subsequent process chain should actually be triggered. So this is possible only when you have the adequate hardware software and the communication technology, if these are not integrated then even if you have the required what you say that information to be available but the required work will not be possible because you do not have the right kind of hardware and software so these are also very important that technology should be adequate.

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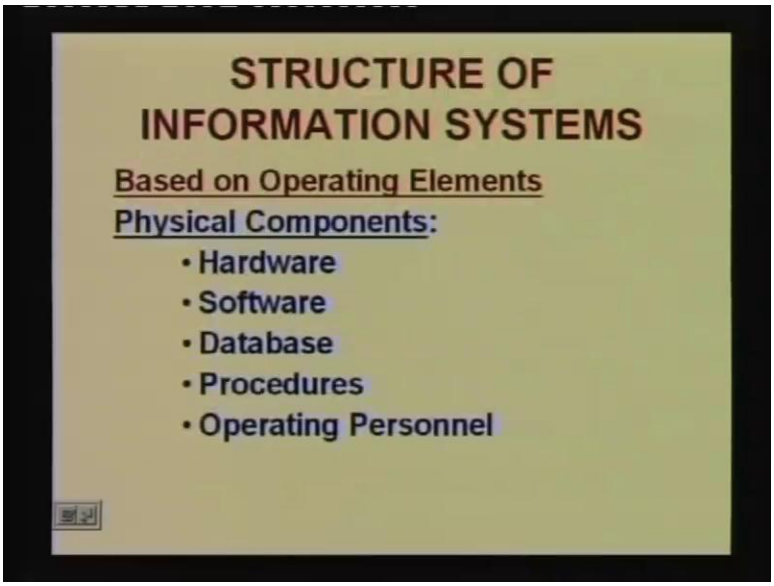

Now beyond that we have the structure of information systems. So we have already seen that there should be changes in the information systems and there should also be changes in the hardware software, there should be changes in the environment so all these changes has to come in has to take place for proper information system to be in place.

Now what we see that if these are the information systems then what is the basic components of information systems. Essentially there are a number of components. The first is the operating elements. the operating elements the first and foremost we have the physical components, the physical components are hardware, the software, the database, the procedures, operating personnel all these are basically physical component which we actually can see with our eyes and which are largely... one can say that they are physically available.

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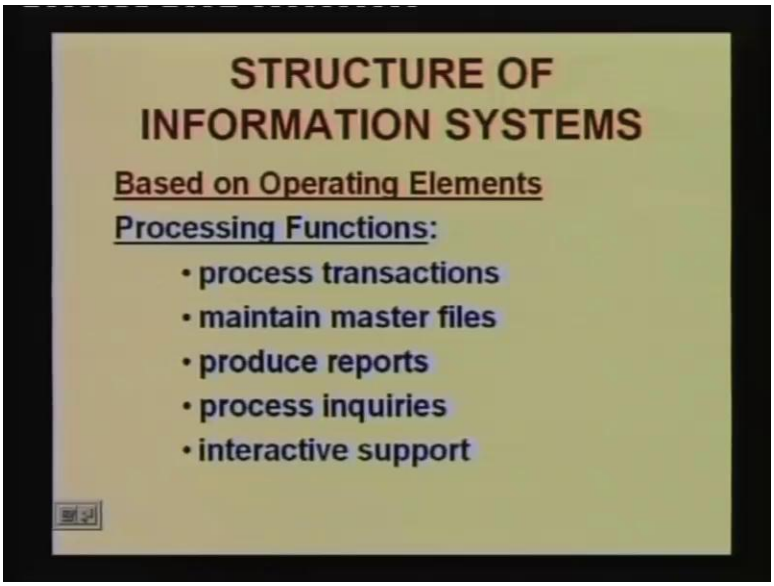

Now beyond that we have the operating elements the operating elements on the processing functions. So processing functions there are basically few interesting ones: the process transactions, maintain master file, produce reports, process enquiries and interactive support.

Now see each of these are although age old but each of them are very important. The first one process transactions and maintain master file. So what happens; whenever we have any kind of information this information the processing particularly the operational information we have to differentiate between what is master information and what is transaction information. Master information are those which are kept say something like if we are having a balance sheet or if we are having the balance of in a bank your bank account balance in that case the actual amount which is there in your bank is the master information and whenever you are depositing or withdrawing money the deposit or the withdrawals they are like transactions. So you see it is like a flow that whatever is inside that is master information, whatever is flowing in or flowing out is the transaction information. So these can be extended in almost any situation. Say for example suppose you have the information of number of people; number of people in an organization, in a position, in the production function, operational function so these are like master information; and the flow how many are coming in, how many are going out, how many are newly joining or

how many are retiring, how many are promoted form one level to other these are all like transaction information. So these are very important they should be differentiated.

The master information are all the time important because they are, say for example; the salaries, the master files essentially are those files where we have the information about the employee, employee name, the employee number, their address, their basic pay, their various emolument details all these will be part of the master whereas in a given month how many days a person has come to the office, the attendance, information and so on, the provident fund deductions they are like transactions.

Then obviously we have to produce reports and process inquiries. The report and inquiries are differentiated. the report is something which is detail which usually is printed x number of pages, disseminated, used for specific use whereas the inquiries are short questions ad hoc once which are usually a few lines which can actually be accommodated in one computer screen they are all inquiries.

And lastly but not least, one of the most important issue is that of interactive support. Basic idea about interactive support is that whenever we have information the information not only has to be processed but given to the particular manager or given to the particular person who requires it but we should also create a situation where the particular manager or the personnel can also interact with the system. Because we all know whenever we have an information system there are many parametric issues or there are many variables which can actually take different values and if those different values occur then our decisions may also vary. So basically if we make a model type of thing where we have the various data and information and model details which are already included the person or the manager he can actually enter his or her preferences and parametric values and come out with new decision suggestions. So these are very important particularly in decision situations so this is also another very important issue.

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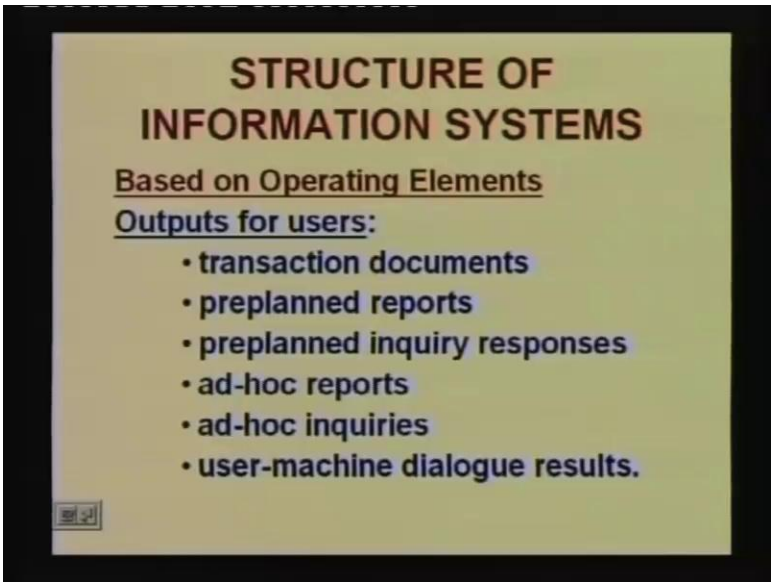

Then we have the output for users. Usually there are various kinds of outputs like transaction documents, preplanned reports, preplanned inquiry responses, ad hoc reports, ad hoc inquiries, user machine dialogue results,

So first and foremost is, transaction documents. So as we have already said the master end transaction master file is something which is there in the database, transaction is the changes that we are imposing on them so we have to have transaction documents so that we can actually have you know recreate the update situations whenever necessary. Because if you do not have the transactional support a time may come when we have the master details but we cannot recreate the situation. By any chance if there is a failure of information system it is the transaction document by which we can recreate our master, recreate our database.

Preplanned reports: See most of the time we may have a situation where we know what kind of reports and inquiry responses will be coming so they are like preplanned. But many a time management would like to have ad hoc reports and inquiries as well. So they are also very important that actually represents the flexibility of the organization. The organization is flexible then ad hoc reports, inquiries should be immediately available.

And the user machine dialogue results: as I was saying that we have the interactive kind of scenario where the manager can actually interact with the computer system. So whenever this kind of user machine dialogue is taking place we also may like to have the user machine dialogue results.

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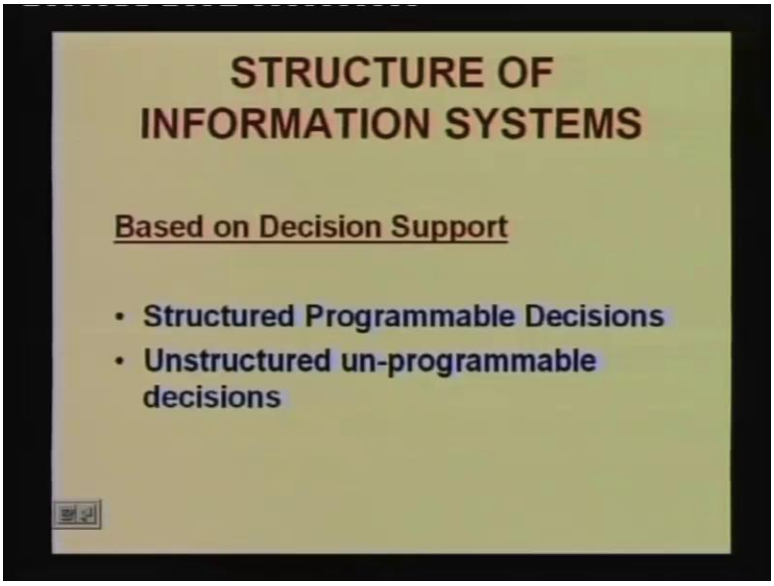

So these are output for results. Then we can have structure of information system based on structured and unstructured programmable decisions. So, when we have structured decisions we can actually program them whereas if they are unstructured they are usually unprogrammable. Sometimes we may also have semi structure so semi-structured decisions are also there. So we have the structured programmable decisions, unstructured unprogrammable decisions and we can also have what is known as semi-structured programmable unprogrammable decisions.

Basically the difference lies in this that when we have the structured programmable decisions these are the type of decisions which are where you can actually make a model out of the situations. For example, let us take something like predicting or forecasting a given situation and let us say we want to forecast the tax that we have to pay, the organization has to pay, forecasting the tax situation. So basically we should have an information on what should be our income, what are different kinds of deductions from the organizational point of view, to know our income

we have to predict our sales and we have to predict the various costs the costs of let us say raw material, cost of distribution, cost of man power, cost of inventory all these different kinds of cost elements we have to assess.

Now there are lots of inflexible or there are lots of things which may not be immediately known or the details may not be immediately available to us. But in spite of that if we put a value in the sense that we we decide that okay we have last year's value and we adjust this last year's value with certain amount of adjustment factors. So if we do that what we have actually done we have structured the decision situation. That means we have assumed certain parametric values and we have a way to tackle the situation which we really do not have much details about.

Another another beautiful example we can find out is that of Material Requirement Planning MRP. Usually what happens in MRP, see any organization deals with a very large number of elements or raw materials. Now when you have to buy all these raw materials we know that the demand of these raw materials within the organization is highly fluctuating. When they are all highly fluctuating we we usually try to feat probabilistic distribution to these raw material demands. Then what happens since we know the probabilistic fluctuations of raw material demands using these probabilistic fluctuations of raw material demand we try to asses when it will be best to purchase.

So basically two important inventory related decisions: when to order and how much to order, we can actually make decisions of these two: when to order and how much to order by keeping in to mind the the probabilistic distributions of the raw material demand.

Now, since there are thousands of parts and we are purchasing every so often the problem looks to pass as a totally unstructured and unprogrammable. So no structure is probably possible to fit into this that is how the problem may appear to us. However, if the organization can actually go for MRP or material requirement planning all that organization has to do is really find out the pattern in this apparently unstructured scenario.

The pattern can be found out if it is we have let us say assembly considerations are possible that means the products are few like something like vehicles. So if this is a vehicle we know that a vehicle has a bill of material. One vehicle if we have to make it we require these these these these items which are obtainable from our bill of material.

Now we look at the annual plan so we have our annual plan where we decide that this year we are going to make 1000 vehicles. So if we are going to make 1000 vehicles and we have our bill of material we can find out by using the bill of material and the figure that 1000 is going to be our annual projections or plan we can actually find out what should be our raw material demand for the coming year and not only that, if we really plan our production accordingly, that okay these 1000 vehicles will be this January, these many February, these many, not only that but January on this day this kind of work will be done, February, January next day the assembly work will be done, the next day this bolt will be fitted, next day the hood will be fitted, so like that if we can actually sequence the entire set of operational activities it is always possible to make our raw material purchase decisions exactly before that which will in effect reduce our inventory. But please understand that it also requires a very big integrated environment to take place. if we cannot work in that integrated manner if we do not have flexibility, if there is a fluctuation somewhere and if you fall prey to that then the whole system may collapse.

So, for these two works the organization also has to be gear to it alright. So this is an example of material requirement planning where we see that a seemingly unstructured unprogrammable scenario can also be transformed into a structured programmable situation. but it is not that every unstructured unprogrammable decision can be converted to a structured programmable decision, no it is not like that, there are situations for example if you are forecasting in a highly volatile market where you do not know,... for example the demand of umbrella. The demand of umbrella we know it is directly proportional to the rainy season or the rainfall.

Now if you cannot predict when the rainfall will come, what kind of rainfall there will be what will be the demand of the umbrella if these are the questions to which there are no straight cut answers then we just cannot really go for structuring the unstructured situation.

Sometimes we fall prey to situation where we try to bring structure to unstructured situations by forcing up on parametric values. You know this is the worst possible thing that can happen. The difficulty here is that we have built a structure but this structure is absolutely useless. So actually what will happen, for example, in MRP if we do not have an item about which we can know the annual demand with certainty and we cannot make a production plan we cannot go for MRP, the whole thing may... suppose you are in an organization where you may have to produce very high demand at a very short notice what will happen, since you have no control over the situation and if you make an MRP like situation if sudden demand comes you are not able to cope up so it is not really advisable that whenever you have an unstructured unprogrammable situation you make it a structured programmable one, sometimes it may backfire. You have to understand the situation and find out the best possible scenario and really do it accordingly. So that is the next thing.

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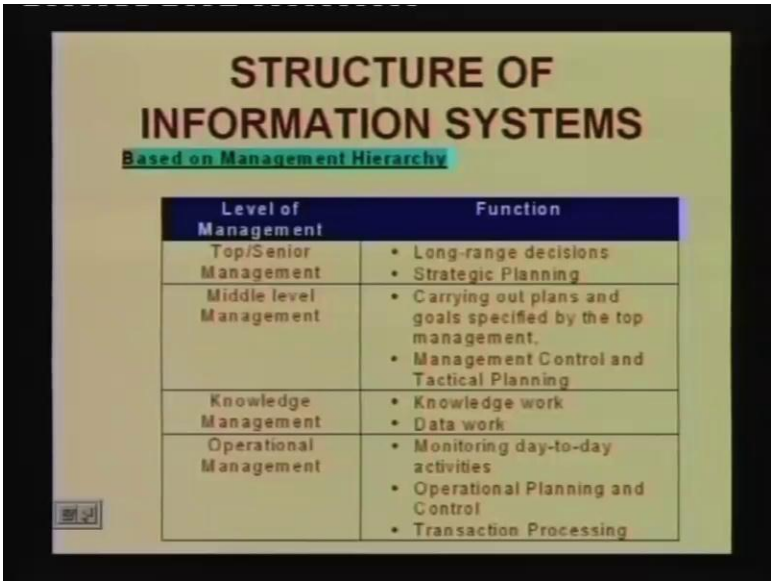

Then we have to see that based on management hierarchy. So you can see that basically we have different levels of management like we have the top or senior level managers, then we have the middle level management, we have the knowledge management and finally we have the operational management. Now these different kinds of management they have different kinds of work. at the very bottom level of management that is the operational management there the

activities are more of monitoring day to day activities, operational planning and control and what is known as transactional processing transaction processing. Then at knowledge management level we have the knowledge work, we have also the data work. Then at the middle level we have management carrying out plans and goals specified by the top management, management control and tactical planning. Then finally at the top or senior level management level we have the long range decisions and the strategic planning.

So let us try to explain this. At the bottom most level that is the operational management they are basically principally responsible for carrying out day to day operational activities something like any any activity which makes the organization running. in other words, we can call transaction processing something like say payroll, something like payroll payroll let us say if you take an example from payroll processing then we can see that every employee who is in the organization has to be paid. Now this payment can actually be done based on whether the person has come to the office, every day to the factory and the attendance details, then whether he has taken any loan, what is his basic pay, what is his dearness allowance and other emoluments.

So you see all these factors are continuously changing. A person who has one kind of basic pay today, tomorrow he has another type of basic pay. a person who is present today may be absent tomorrow. A person who has certain attend PF loan he might have repaid it tomorrow. A person might have taken new loan from provident fund. So you can see that the transactions are all the time taking place. So there should be some people who should take care of these transactions alright. So these... the persons who are actually you know helping in carrying out these transactions they are doing what is known as transaction processing job.

Now information systems are coming increasingly in computers and the information system is taking over much of these kinds of transaction processing jobs. So whenever we talk about automation say we say banking automation bank has large number of transactions taking place all the time, so if you have computers you can actually take care of much a large junk of these transaction processing. So it is the job of the operational managers to plan the transaction processing in the most effective manner.

Next they have to also plan and control. The planning and controlling is very important. For example, look at at any factory or manufacturing organization situation. What happens there the manufacturing organization has to carry out the day to day production activities. Now this day to day production activities whenever is taking place the very important part is the planning and control. Suppose you cannot really run your production systems, until unless you have the required number of people they are available the machines they are maintained on time, the raw material supply is taking place, the working process inventory is available and the distribution and transmission is taking place in a smooth manner.

Now, suppose if there is a loss of balance in any of these activities the production process comes to a grinding halt. So the planning and control is a very very important issue here and information support definitely is also very important in this regard.

Finally monitoring the day to day activities; so whenever you have these day to day activities you know these also have to be monitored so that we have to see whether the target is really reached. If the target is not reached then we know that there is a gap and this gap has to be filled up. so these are really all to be carried out.

At the middle level management basically the middle level managers are not carrying out day to day activities. The middle level managers have to see that the operational management work is taking place in a most efficient manner. That means if there is payroll the payroll has to run smoothly and for that you need tactical planning. So what kind of tactical planning? Suppose whether there is adequate cash that is available for sustaining the payroll over the next few months. Whether we have... if we are using information system, whether the information system for this activity they have the adequate hardware, software, people and all these things are there. Now, if the management has a specific plan suppose the management decided that the machines are to be upgraded at a given point of time so this upgradation of machines whether they are taking place on time. So that is also very important because you see it is the plan of the management to upgrade all these machines.

Now upgradation of machine is one thing that may be a long term plan whereas regular production is going on. If you have to upgrade the machines simultaneously the regular production gets hampered. So say at the same time by keeping the regular production running you you also have to replace the machines, you have to start new base so these are also part of the middle management tactical planning and management control.

Then carrying out: So plans and goals are specified by the top management: So you see the plans and goals okay... the carrying out is one part. But setting the plans and goals, the top senior management they actually make their decisions only through the middle level management. We should also understand the middle level manager or middle level management has to take care of the operational management and do not look to the top or senior management. It is not the job of middle level managers to pass on all the information to the top level managers, get their decisions and and support it in in accordingly.

What is really required at the middle level management level is that the middle level management should really have with the top level management situation where the top level management will basically plan for the future. So you you have to see this way. The job of the top level manager is not just to look inside the organization but look outside the organization, try to see what is happening in the market place, what is happening with the competitors, try to bridge the gap and try to look for newer avenues, try to see that the strategies are set for the organization, try to see what should be the long range decisions because today the business may be fine what about the business tomorrow; all these decisions has to be taken at the top level of management.

The middle level management will help the top level manager because they will provide the adequate summaries and details to the top level and the top level management by the strategic planning and the long range planning that they carry out they will provide the required policies required guidelines required what you call the the decision set ups; you know all these things they will provide to the middle level managers so that the middle level managers can do their job in the most adequate manner. So that is how the different levels of management will work.

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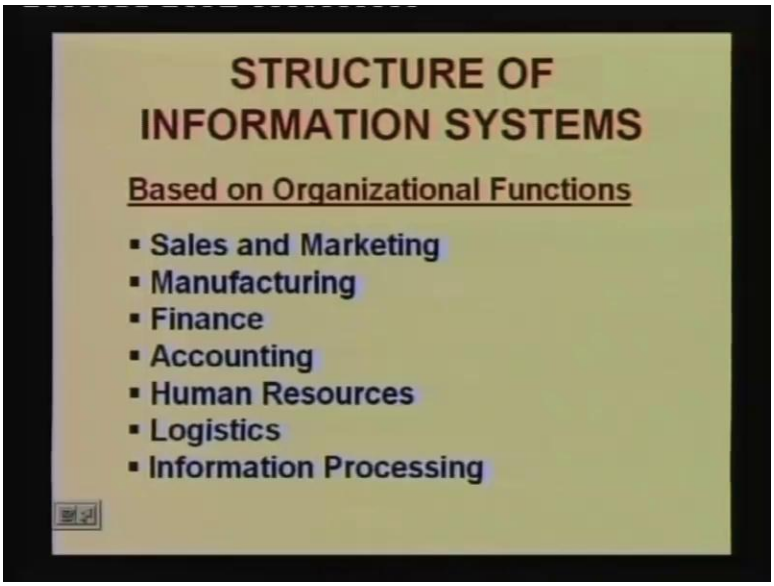

So, on the other side of organizational functions we have the sales and marketing, manufacturing, finance, accounting, human resources, logistics, information processing these are all important activities on organizational functions. So let us try to see how all these activities are combined together.

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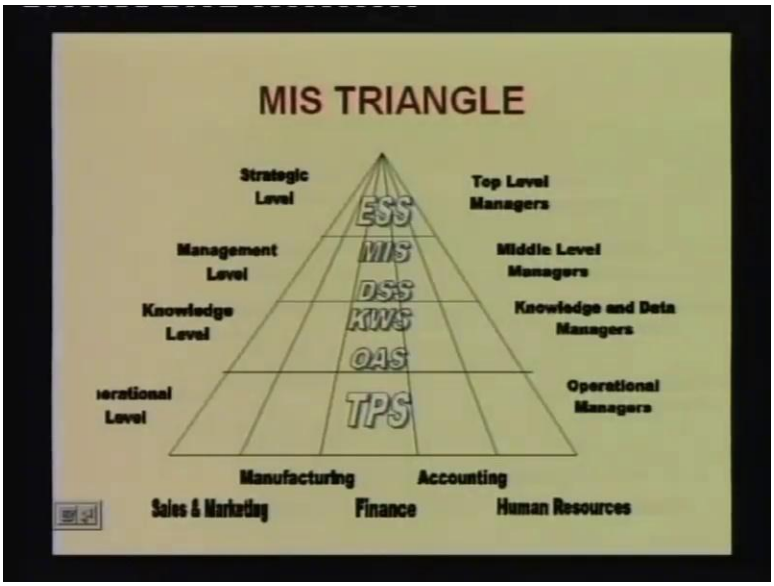

So you can see we we have drawn what is known as MIS triangle. The MIS triangle has got the top the top level managers, then we have the middle level managers, knowledge and data managers, operational managers and on the other side we have the strategic level, management level, knowledge level and the operational level whereas on the other side we have the sales and marketing, manufacturing, finance, accounting, human resource. So the vertical divisions are the levels of managers and on the horizontal we have the sales, marketing, manufacturing, finance, accounting, human resource so various other what you call different functions on a horizontal basis. So every every such function will also have these kinds of managers.

Finally a little bit about the knowledge level managers. The knowledge level managers are a special class of people. They are neither it is not that they are in between stage between management level and operational level. The knowledge level managers they are working on knowledge and data may not be operational work directly all the time but really trying to do things that will help the organization in the long run the kind of work which require processing of data definitely but on a different way where knowledge is created which will ultimately help the organizations.

So we stop here today and in our next class we continue from here and we will try to see how all these different kinds of information systems together constitute the management information system of an organization. That is the information system architecture.
Thank you very much.