**Management Information System**
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**Lecture - 02**
**Introduction Part – II**

Welcome to all of you today. We shall continue with the introduction. In the last class we have already seen the first part of the introduction and in that we have specifically seen the following things.

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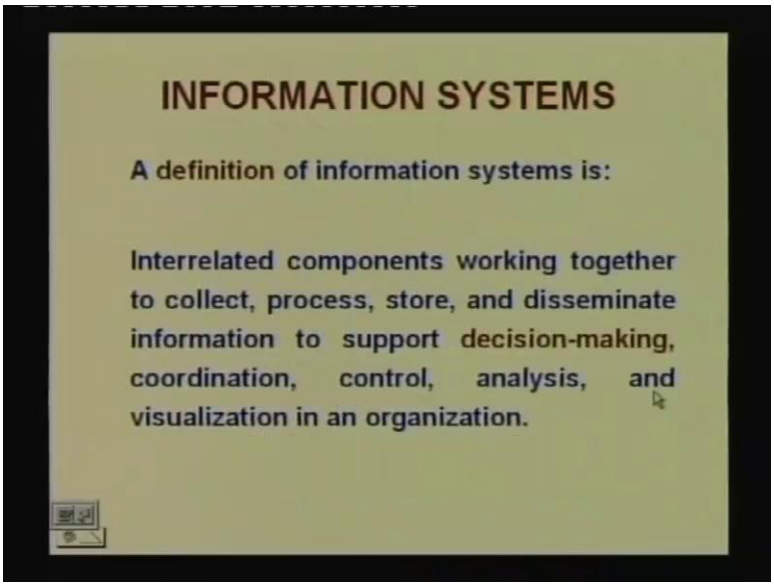


At the very beginning we had we had defined an information system. An information system, as you can see, has been defined as the interrelated components working together to collect, process, store and disseminate information to support decision-making, coordination, control, analysis and visualization in an organization.

Now we had also seen that how in today's context the information system processing is a complex process and there are many reasons for that. Specifically the organizations are changing, becoming more and more complex, the business place is changing, the competition is intense and therefore a competitive advantage can be obtained through the information system

and therefore the management information system is a very important component of today's business. There are various reasons for that and we have discussed to some extent in our previous lecture.

Today let us see what are the basic components of information system, what is information and how information can actually help in the building of an organization; and specifically how information can support the management in various ways.

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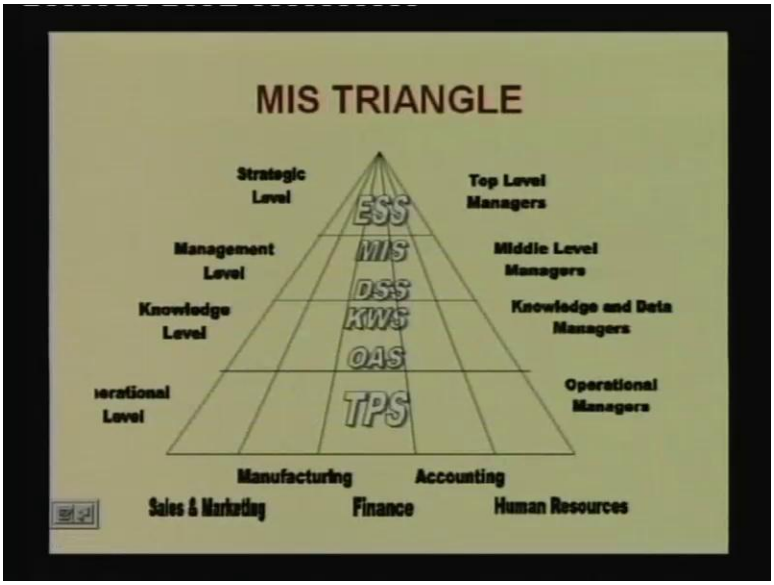


To begin with we have seen the MIS triangle. The MIS triangle as you can see on the horizontal dimension we have the organizational functions like: sales and marketing, manufacturing, finance, accounting, human resource and so on and on the hierarchical level we have got the different levels of managers such as the top level managers, middle level managers, their knowledge and data mangers and the operations manager.

Various types of information system that supports these various levels of managers or management are Transaction Processing System TPS, Office Automation System and Knowledge Work System that is OAS and KWS. The Decision Support System and MIS

Management Information System; that is DSS and MIS at the middle level of managers and finally the executive support system for the top level of managers.

Now a little bit about the big MIS and the small MIS. See the MIS as in MIS triangle you can see that these actually represents the big MIS that is the complete gamut of all kinds of information systems that are to be present in a particular organization. Therefore it includes all the information systems like: transaction processing system, office automation system, knowledge work systems, decision support systems, management information system as well as executive support system.

However, the small MIS, that is specifically that information system which supports the middle level managers at the management level basically concerns itself to provide a specific inputs for control; not only for the operational level but also to send specific inputs to the top level of managers.

We shall discuss more about the MIS triangle and the various kinds of information system in our next lecture. Today let us specifically try to look into the information part, that is what is information, how information is different from data, and how information can help an organization to have a control process. So that will be our specific theme for today.

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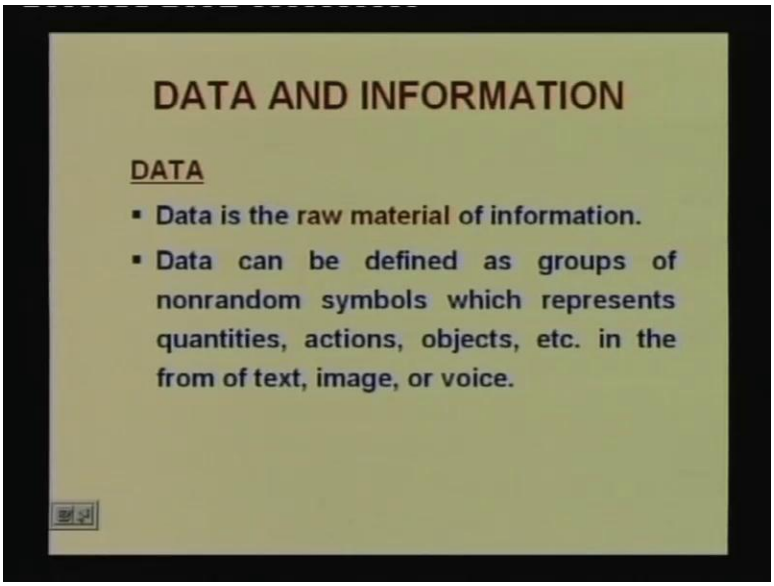


As a very beginning let us differentiate between data and information. Data as you all know is a raw material of information in the sense that these are groups of non-random symbols which represents quantities, actions, objects, etc in the form of text, image or voice. So something is data which you are actually collecting in an organizational context. So it could be anything starting with say how many work... how many people are present at a given point of time for a specific work, what are the let us say the targets and what is the let us say production process, how many machines are available, everything that you can think of let us say in a production management situation where you have to do a certain amount of production; we know that the production is possible only when we have a certain amount of resource available.

Now these resource... any information with regard to that is a kind of data. that is let us say for today's production to take place we have the machine, we have the manpower, we have the material the raw material, we have the processes, we have the job cards, we have the root cards etc, so all that we obtain about the particular system consists of the data in the given context.

Now if that is data then what is information?

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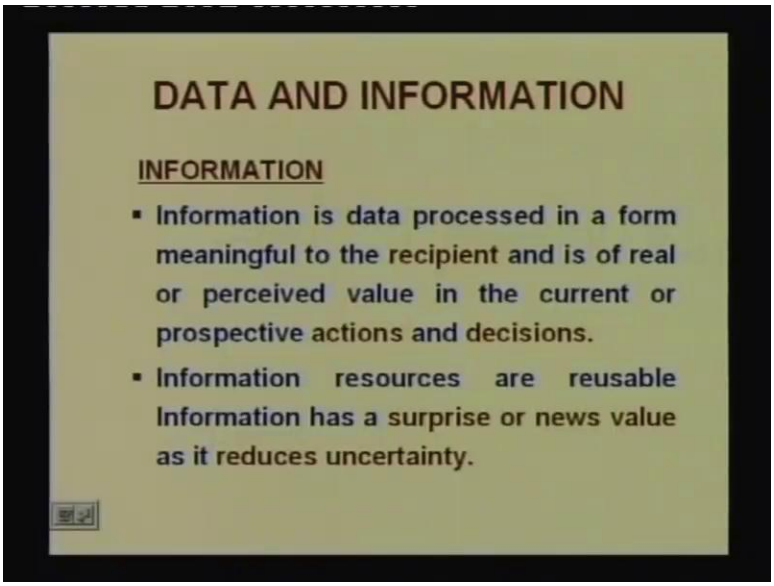


Information is data processed in a form meaningful to the recipient and is of real or perceived value in the current or prospective actions and decisions. See, basically the idea of information therefore is that it is not just the data that you have with you, but the data that is actually processed in some form and this process data is of some use to the ultimate recipient for prospective action and decision-making. So you have to make some decisions with that information.

Now if someone tells us that okay today our production is 250 units; is it information or data? It is still a data because just by knowing this 250 is today's production is not enough, we cannot take any decisions or make any decisions on the basis of whatever is today's production. But someone tells us the today's target was 300 units and we have produced 250 units that is a short fall or a gap of 50 units, so that actually is going to be an information.

Basically the idea is that we have a target, we have an actual value that is data and we have a difference so you know some kind of an error signal. these error signal is a kind of information because it gives us a pointer to decide whether the production is proper or the production has to be geared faster, more resources have to be put into the production process or we have to what you say that revaluate revaluate our targets.

So you see that information is therefore something which can help control the process. Simply knowing that the production is 250 does not become an information, it becomes an information only when you qualify it, qualify by giving a target. So you see, that is what is going to be of some use to us. Say information resources are reusable. Information has a surprise or a news value as it reduces uncertainty. So you see if there is no uncertainty then there is no information.

Suppose we know very well that our production is going to be 250 and we have actually achieved 250 what is the information here. We knew it will be happening and we have come to know that it has happened. So apart from simply knowing that it is going to happen and it has happened there is little surprise value. So therefore you see the decision-making... so if we had already known that we are going to produce 250 today and we have produced 250 beforehand itself, we could have made all the decisions that is necessary. So there is no surprise value and therefore there is little decision-making content.

The decision-making content can actually be there only when we actually know that yes this is what we wanted to achieve but we could not achieve or we have achieved more than that, only then we actually have a surprise value; the information that this is today's production can help us in making prospective decision and in that sense we can say that this is an information. So that is the basic difference between data and information.

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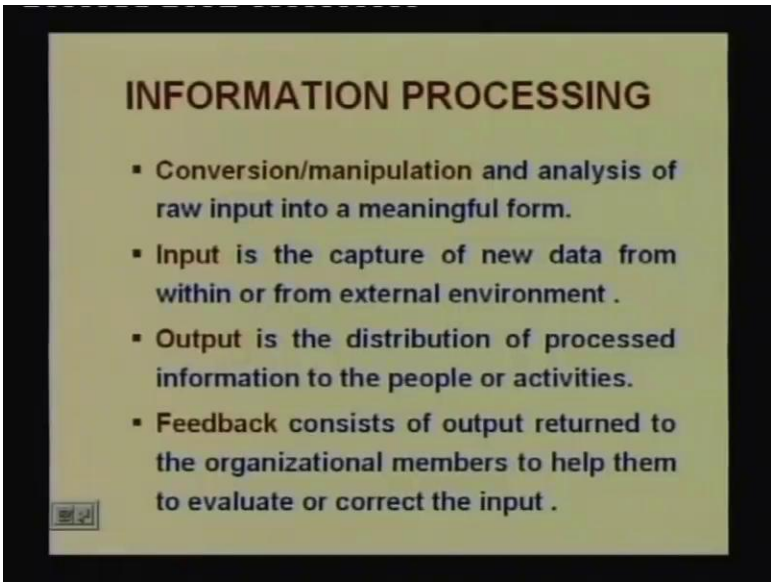


Information processing: Particularly when we are thinking of processing information the basic idea is that we have the raw input and in these we are having a conversion or a manipulation process. So a conversion or manipulation and analysis of raw inputs into a meaningful form that is actually we can say is information processing. So naturally there are three basic elements: the input, the output and the feedback.

Input is a capture of new data from within or from external environment. Output is the distribution of processed information to the people or activities. Feedback consists of output return to the organizational members to help them to evaluate or correct the input. So we have the input, we have the output and we have the feedback. These three processes the input to output is basically the conversion or manipulation and the feedback which is the output returned to the organizational members to help or correct the input. So all this things can be put together in the form of a diagram. Let us first see the diagram.

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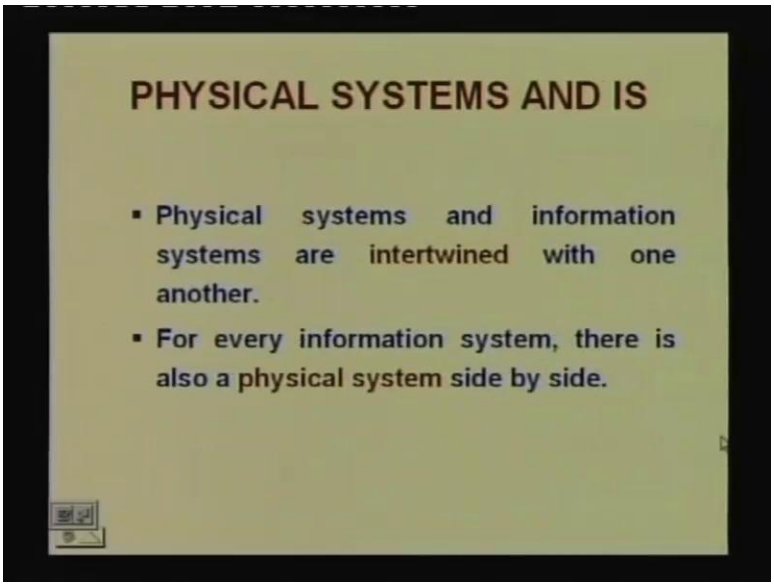


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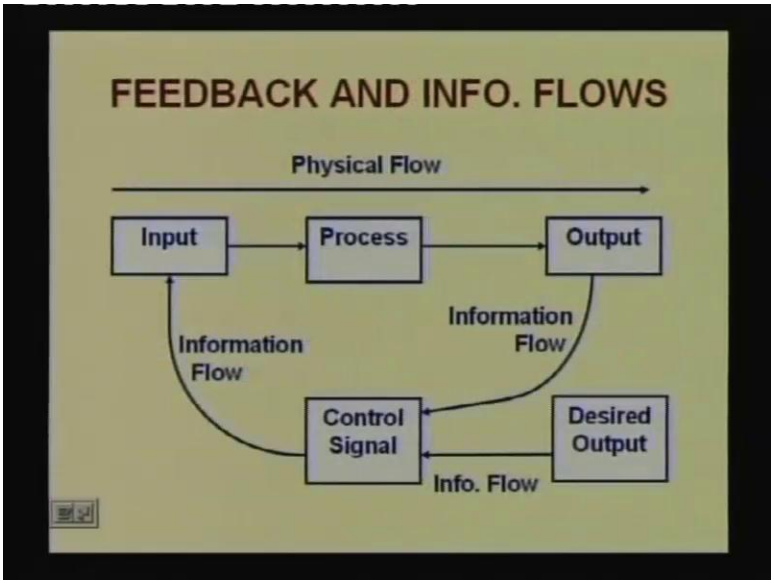


So this is the particular diagram. We will come to the other details later on. In the diagram we can see that we have the input, we have the conversion process, we have the output and we have a desired output because we all all the time we said that you know simply having data about the input or process or output does not make it information, it it has to be qualified, how do we qualify, we qualify by taking a desired output. So we have an output, we have a desired output. The difference between the desired output and output can be called like a control signal and this

control signal basically gives us information through which we can control the input or we can control the process as well. So we can control the input through the process directly or we can intervene the process parameters, in that sense the process parameters are also certain inputs.

So the feedback loop, you can see this is our feedback loop all right. So the feedback loop is actually completed by this input process, output and these input process output and the control signal and again the input now together it makes a feedback loop.

What is this feedback loop?
This is going to be a negative feedback loop. Why it is a negative feedback loop is because we can see that if we have more input we can have more output. Now the idea is that we want a desired output. Since we have the desired output the difference that is the desired minus actual all right, so this is the actual, (Refer Slide Time: 13:37) this is the desired the difference is the control signal. So in that sense we have a negative sign from output to the control signal. Because of these particular negative signs and positive sign everywhere else we have a negative feedback. In another word, a negative feedback loop is one where we we are trying to achieve a balance where the output... trying to reach the desired output, it does not outgrow the desired output; if the output is below the desired output the control signal is positive and it therefore has you know requirement of more inputs whereas if the actual output is more the control signal is negative because if the control signal is negative we actually reduce the inputs so that the output falls to the desired output level.

So wherever we want a control we want a balancing process we actually go for you know these kinds of negative feedback control and this negative feedback control is a very very important component of every information system. Because let us try to understand that ultimately why are we processing information. Many a times we think that we are processing information because we want to process information, no not at all. We should not process a single bit of information until unless it serves a purpose. What is the purpose? The purpose is prospective decision-making.

How we make decisions? By controlling the process. So we have to have a control and this control is achieved through the information and that is the basic purpose or basic idea of having an information system in place. Any information system which does not do any processing which is existing just because it is there probably serves little purpose.

See many a times we we have information systems which actually summarizes, which actually calculates lot of data. But if those data or summary that we have calculated is only to gather dust on the table of a manager then what is the purpose of that kind of an information system; probably nothing. So that we cannot even call an information system and that processing is not information processing, it is only data processing all right, so that is what we must keep in our mind.

Now let us go back to the specific thing where we wanted to discuss about the physical systems and information system. Please understand that whenever we are planning an information system or we are thinking of an information system the information system alone is not everything, we should have or we must have or we are always having something like a physical system which is also very much present along with the information system. To understand that let us... that is our example that is an inventory monitoring system we will come to that.

Basically suppose think of an inventory monitoring system. Now, in an inventory monitoring system we have basically a process where we want to have a control on the inventory of a particular organization.

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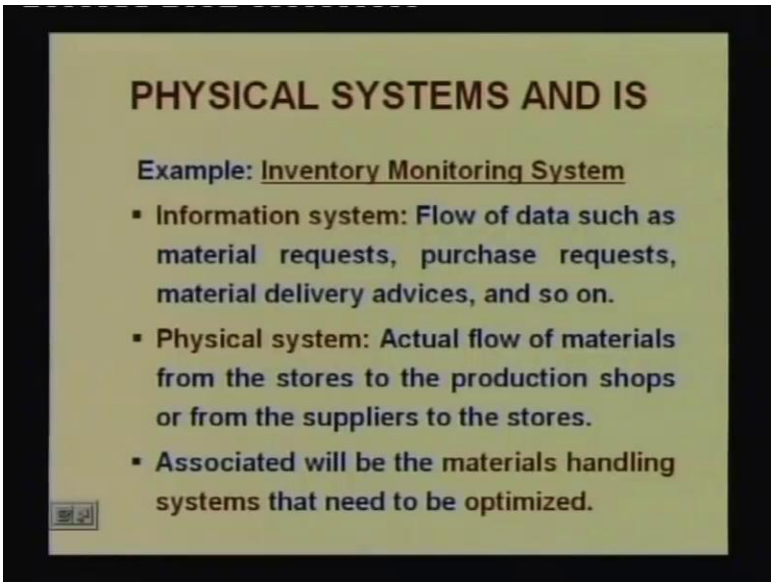


Now in this inventory system there could be something like the flow of data of material requests, purchase requests, material delivery advices and so on all right whereas the physical system part could be actual flow of materials from the stores to the production shop or from the suppliers to the stores. Associated will be the material handling systems that need to be optimized. So basically what it is actually trying to say. It is trying to say that that we have basically an actual flow of materials.

Now how does actual flow of materials takes place in in any organization?
We all know that flow of materials for example; if they are heavy raw materials something like steel you know you cannot simply transport them just like that. If they are something like casting ingots then you have to have a conveyer belt system. If they are steel you may probably require transporting system such as trucks. So you see how the trucks will enter whether there will be queuing, whether there will be enough space for truck movement, whether there are enough number of trucks, ah whether there will be bottlenecks, whether there will be checking you know the inspection process is streamlined, so there are many many considerations that are there in the physical system and therefore a student of inventory management probably would study... a student of materials management would probably study all these considerations that you know how how... what should be... when to order how much to order that is one thing. But apart from

that where to stock? Is there enough space? Are we having a very smooth distribution system? are you having a very smooth transportation system all these are extremely important in that particular context that is in the context of the physical system.

But we are, here in this particular course mainly talking about the information system. So we we are not really going to think about the physical system problems all right. We are going to think about the information system problems. Because this particular course "the management information system" is about the information system problems. So here we are not really bothered how the transportation part will be taken care of all right. But what are the information that is associated with that.

For example; the flow of data that is a flow of material requests. Naturally if a material request comes along with a particular consignment, if the consignment does not come the material request will also not come. So indirectly we come to know that okay material request is not coming therefore we do not have the particular information or particular consignment coming. So you see the physical system is coming back. But control part of the physical system is coming back how to solve the physical problem that is a separate problem you have to solve and that is not in the domain of MIS. But what kind of control you want to achieve, what kind of information system that you should build so that you get the control signal that is within the domain of MIS.

So you see the material handling systems, the optimization of material handling system: how we optimize? Whether to have trucks or conveyers or what? That is the physical system problem. But since we are coming to know that whether material has actually come or not that is an information system problem. So information system will tell us whether the physical system is optimized or not. so you see it gives a pointer, it gives a feedback, it knows that okay we have to make some decision so indirectly we can say that information system helps us to identify whether the physical system is to be optimized, if it is to be optimized in what manner and how that we are getting from the information system problem. But actual optimization how to optimize those details are physical system problems. So, for that you have to study other kind of subjects.

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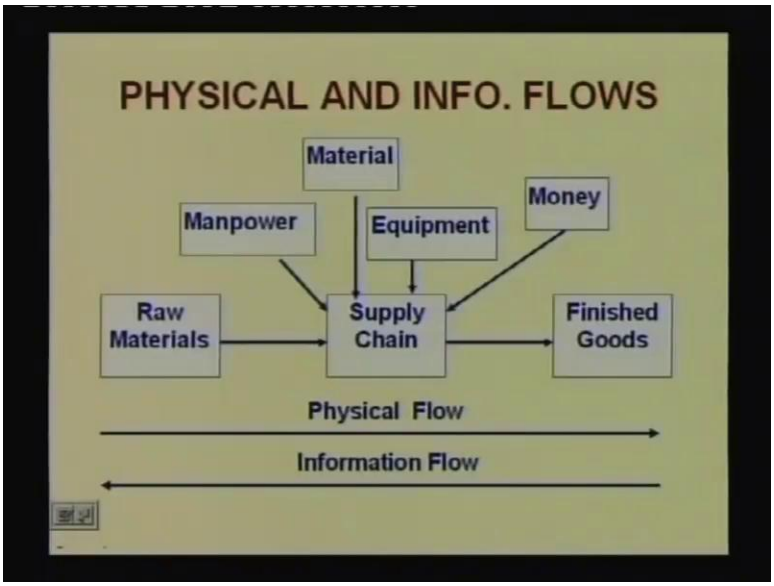


Now... so going back now you can see that here the diagram. In this diagram a supply chain supply chain where the raw materials are converted to finished goods, we have on one side the raw materials then on the other side we have the finished goods but through this supply chain the raw material passes through. What is the supply chain? It is coming from the raw materials the entire inventory process, coming to the factory then work in process, distribution and finally goes to the finished goods; in between we have various resources like material, manpower, equipment, money you know all these things are actually you know... material, man... material, manpower, equipment, money you know all these things are going to be very much part of this supply chain and these supply chain process you know the raw material to the finish goods if you can see the physical flow takes place in the left to right whereas the control purpose the information flow usually has to be from right to left because that is how we shall have a control.

And we all know... you see I think the push system but since the pull system; increasingly we come to understand that the organizations are working in the best possible manner when you can actually create a pull system: a pull system in the sense that do not bring raw material just like that, do not bring raw material because you simply want it; bring raw material only when the finished goods are required. So you take signal from the right hand side, you see what are your

finished goods, what finished goods will be required accordingly you make your production process.

You see what is your WIP. If you have enough work in process inventory do not purchase raw materials because you see you have work in process, do not issue raw materials from the inventory. Similarly, do not procure raw materials until unless there is a demand there is a demand from your production processes. So it is the production process that will dictate to tell us which raw material to buy. It should not be that simply because we have bought all these raw materials let us produce, that is the push system and we have seen that push system will create inefficiency, will lead to lots and lots of inventory, lots and lots of work in process and probably it is not a very good idea.

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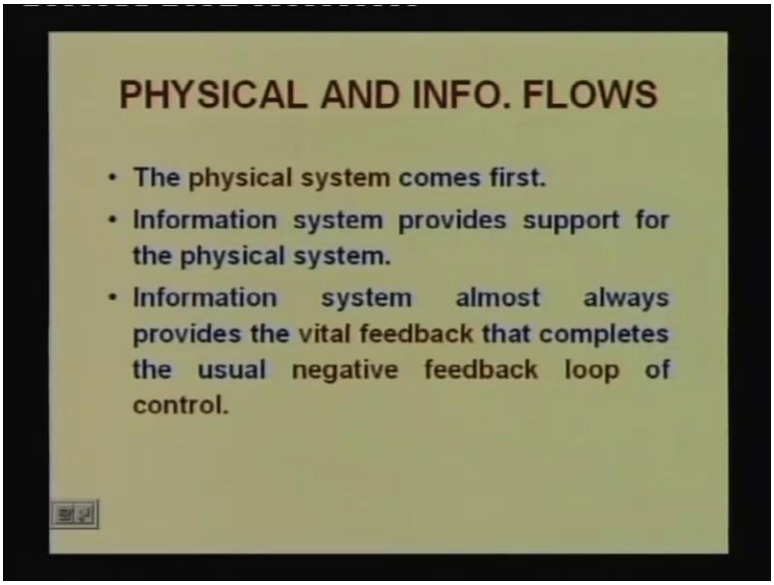


So... because that is... so so you can see in summary we have written the physical system comes first, information systems provides support for the physical system, information system almost always provides the vital feedback that completes the usual negative feedback loop of control. So the physical system is the first and the information system is a support system to the physical system. Basically the information system provides the vital feedback using which a pull system

can actually work. So that is... usually such feedback loops will be the so-called negative feedback loops of control.

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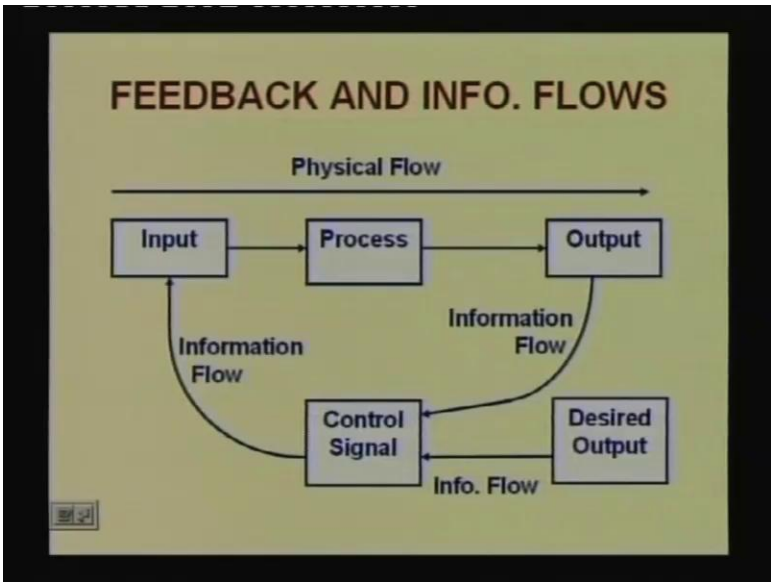


So this is the diagram that we have already shown: the input process-output, the information flow, the desired output and through this information flow we control the input that is the feedback process. So again the physical flow direction is left to right and information flow direction is right to the left. So these are the processes through which the entire thing is intertwined.

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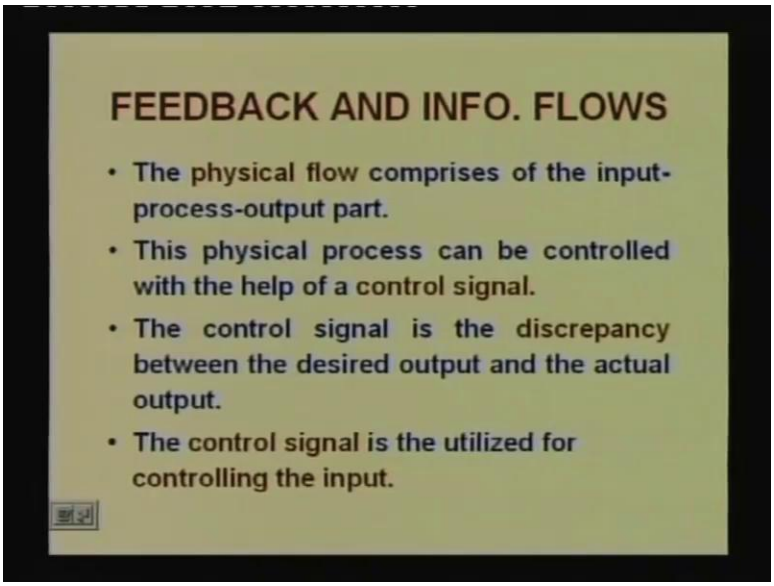


Now this is the summary of what exactly we have discussed that is the physical flow comprises of the input process-output part. The physical process can be controlled with the help of a control signal. The control signal is a discrepancy between the desired output and the actual output and finally the control signal is the utilized is utilized for controlling the input, right? So this is the feedback process of information systems.

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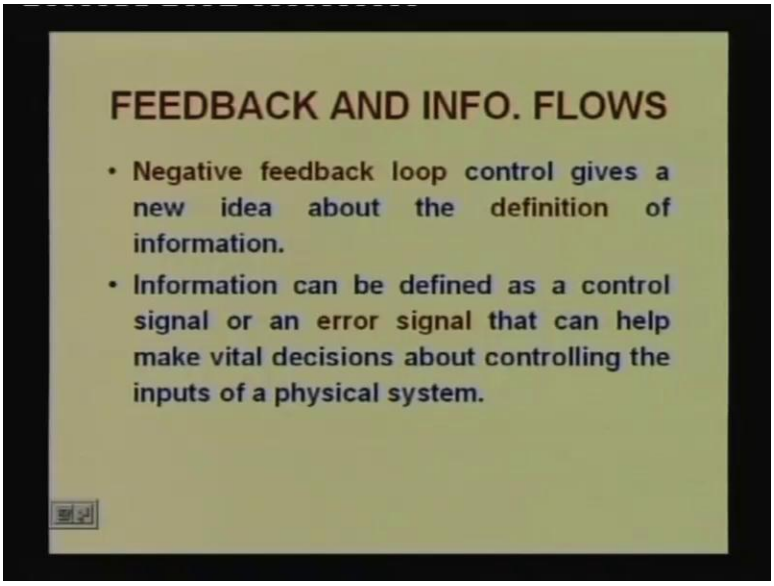

The negative feedback loop control gives a new idea about the definition of information. So we can also now define information in a different manner. Information can be defined as a control signal or an error signal that can help make vital decisions about controlling the inputs of a physical system. Let me repeat. Information can be defined as a control signal or an error signal that can help make vital decisions about controlling the inputs of a physical system.

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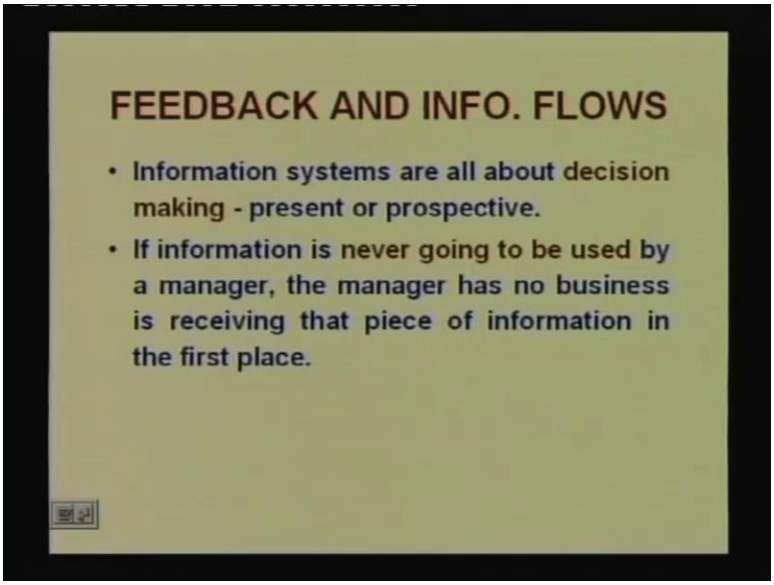


So information systems are all about decision making, presents or prospective. If information is never going to be used by a manager the manager has no business in receiving that piece of information in the first place. So this gives us another very very important dimension. We will come to that. So before okay... so you can see it gives a very good pointer that who who should receive which information and why. Let us try to understand this in a slightly better manner. So let us see let us see a particular example, okay?

So suppose we we are trying to see a particular example where we we let us say an organization chart so say this is the organization chart (Refer Slide Time: 27:43).

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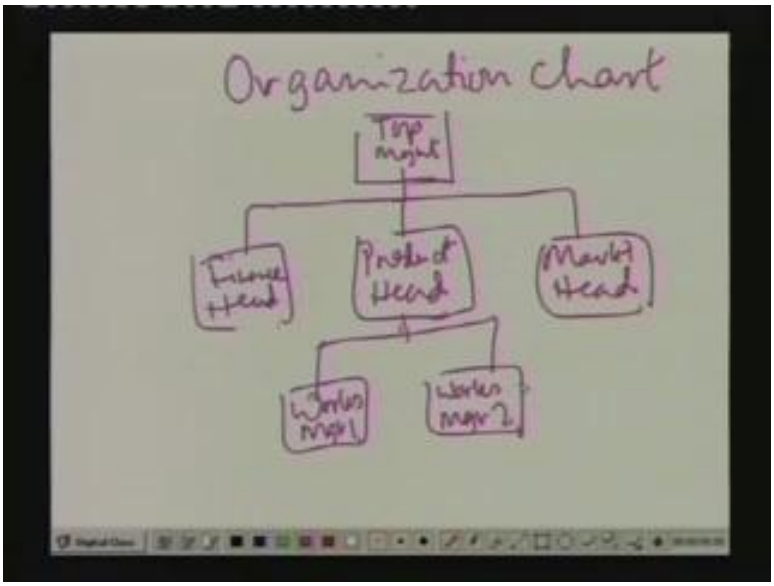


Now this is a very simplified organization chart, a very very simple one where we can see that we have the top management and just three broad heads I have identified: the financial head, the production head, and the marketing head.

Now, in production department let us say we have the works manager 1 and works manager 2. Now let us say a particular set of information that is let us say the information related to the production processes right. So what should be my production process? What should be my production process and we basically prepare the process charts. So the process charts preparation and information with regard to the processes.

Naturally this is not really made directly by the works manager 1 or 2; may be the supporting unit under the works managers they prepare the production process details. Now suppose the existing practice is whenever we create these production process information, production process information, I mean what I mean by production process information is whenever we need to produce anything let us say a particular equipment the equipment requires a number of components, whenever we want to build a particular component I naturally require a number of process and each process will require you know each assembly will require several production

processes and these processes or operations have to be defined, they may be put in the production process information.

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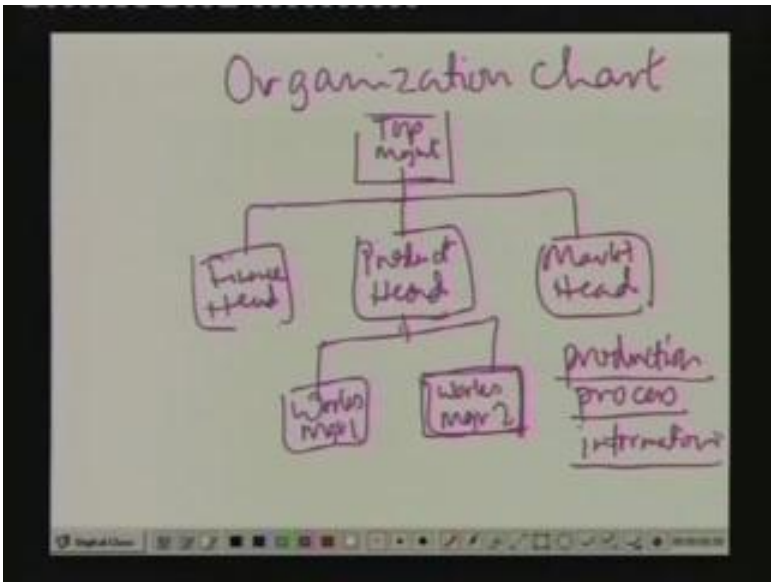


So let us say the people under the works manager 1 and works manager 2 they actually create the production process information and it is the practice to send the production process information to let us say the works manager 1 to the works manager 2, the financial head and in turn the works manager sends them to the production head and also send to the marketing and finally the production head sends this information to the top management.

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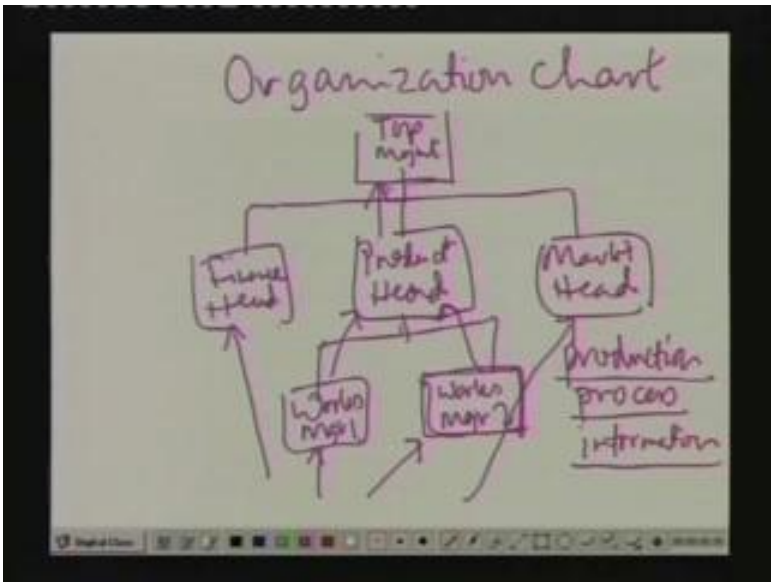


Then what is actually happening here; this piece of information is actually being sent from you know the people below works manager to almost all these positions in this particular organization. The question immediately comes that who makes what decision with this production processes; is it the requirement of the marketing people to do anything with the production process information? The question the answer to this is no. Probably the marketing department has nothing to do with it.

Basically the production process information is important so that we can actually create or we can actually assess what will be our requirement of various resources so that the production process could be smooth. In that sense the production head could be a person... but again he does not require production process information in its entire team, he would probably require a derived information out of the production processes that what is the requirement of raw material, what is the requirement of work in process, the act various levels of the organization, at the various stages of the production process. So no not the complete production process information but a summary of it probably what the production head requires.

The top management again does not require the complete information. He does not want to get the complete details. He wants to know even more summarized information that with the existing

production process in this particular organization what is the type of expenditure, what is the type of time that is being taken and if we compare it with industry bench marks how do they compare.

So you can see that in this particular organization, information is being sent to people who do not require it, information is being sent to people who do not require in its entire team. So there is a need for a MIS study which will say that do not send this information to finance head, do not send this information to marketing head, do not send this information to its entire team: to the production head or the top management, summarize the information; use filtering, also use exceptional part of information. We will come to that later.

So you can see that substantial amount of processing is required which an and a criteria through which we decide who should get what information and that is a very very important component of a MIS or management information system study, all right? So that is what we would like to do that; that is if information is never going to be used by a manager the manager has no business in receiving that piece of information in the first place, okay? So that is what we want to highlight in this particular situation.

Now let us try to see what are the various kinds of information that is the various types of information system.

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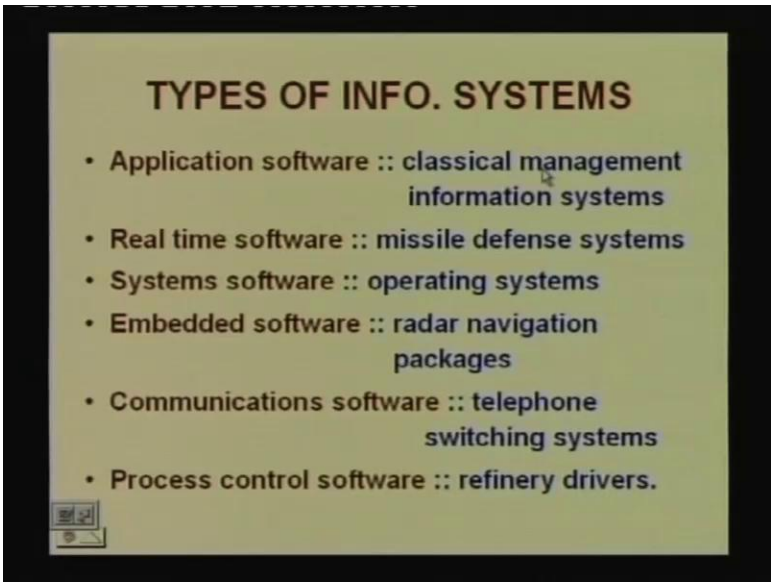


The various types of information system we can we can identify, so some of them are here. That is the application software, the real time software, the system software, embedded software, communication software and process control software. Right?

So the first thing is the application software. The application software is the classical management information system. Basically this is the domain on which we shall mainly deal with the application software.

The real time software are basically those kind of software... basically the difference between real time and online is that online is something which is... the transaction is input as and when the transaction occurs. For example in banking operation whenever there is a withdrawal of money or whether whenever there is a deposit of money if it is immediately entered into the computer we can call that as an online system or online software system. But it is real time where the control action is also taken in the real time. So, in missile defense system not only the missile is moving but we have to collect data as and when. But depending on what kind of data we have got if required we have to recourse the missile, we may have to change the path of the missile in such a way that it moves in the correct path so that is called real time. So real time is the... if if if again let us try to look at particular this thing.

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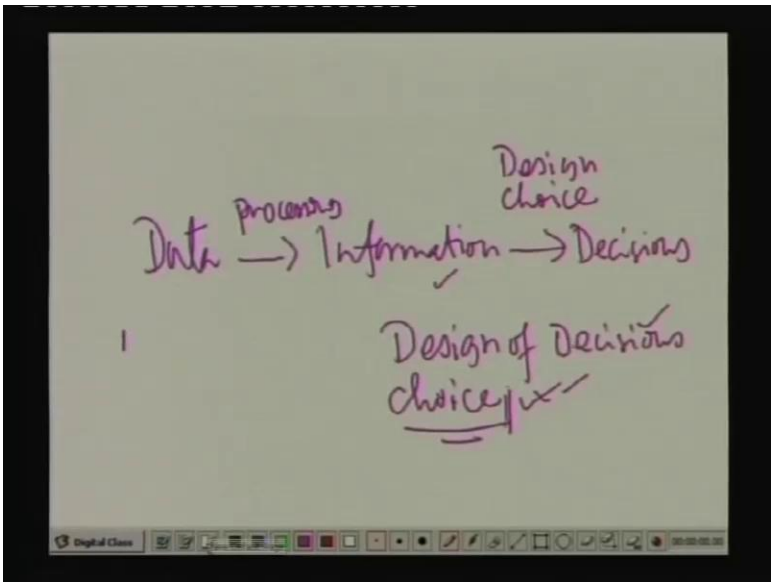


So say the real time is like this that is if we say say data to information to decisions. So this is the conversion. We have the data, we have processing through which we have the information then we have the choice. So various... the information will actually do three things actually: One is design, choice and you know that the decisions. So not only the design of the various strategic decisions but finally the choice of the decision as well. Okay. So if these are my components that after processing the data we get information and after information we have to go through the design and the choice process that is... here design means design of decision alternative design of decisions, what decisions we want to take, what are the different alternatives and choose one of them.

So in this case not only the data is being processed, an information is obtained that is online. But also the design of alternatives are made and a choice of one of them is made that is called real time software. Right. So the real time software is a very specific case is a very specific case like missile defense system. It is not really prescribed that we go for the real time software for management systems because the management systems are complex and it is almost always true that the final decision should be with the managers rather than with the information system. It is very important that information system should act more like a support system rather than a

decision taking system. The final decision taking should be with the managers. Right. So that is the idea.

Then the system software: the system software again is a very specific class of software. in fact all of them: system software, embedded software, communication software, process control software they are all very specific classes of software which are being used for specific purposes and really may not be true so much for an application domain. So if we have to design an operating system it is basically a kind of system software right so basically in the domain of computer scientists.

The embedded software again radar navigation packages; you know the software is embedded into the hardware.

The communication software like telephone switching systems again embedded in the communications.

The process control software like refinery drivers which are engineering applications more into the knowledge work domain. They are not really what you call the focus area as far as this course is concerned. So this particular slide I have shown is to really highlight the kind of software system that we shall use in this particular course that is the application software. So, mainly our focus in this course will be on application software specifically.

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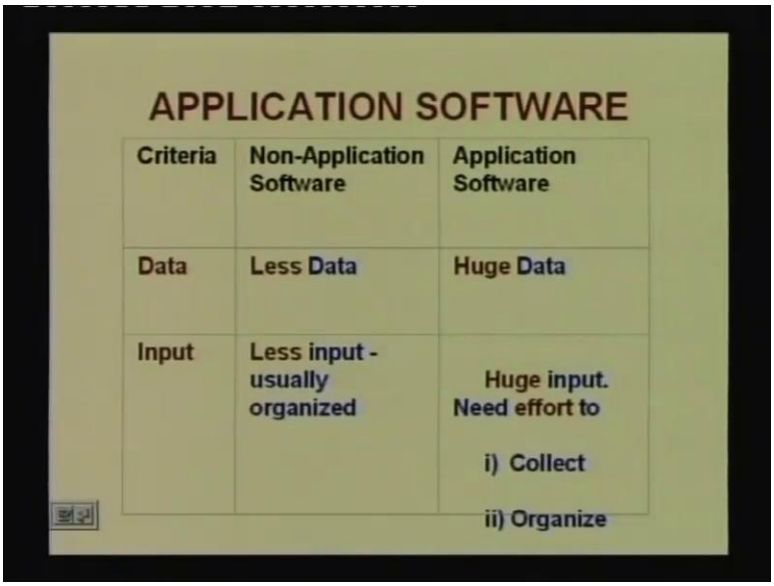


So we can... let us try to understand the difference between application software and non-application software. In non-application software usually your scientific applications whenever we have we see there is less data whereas in application software there is huge data. Right. The input: less input is usually organized. But in application software usually we have huge input and we need effort to collect data as well as organized data so both are required.

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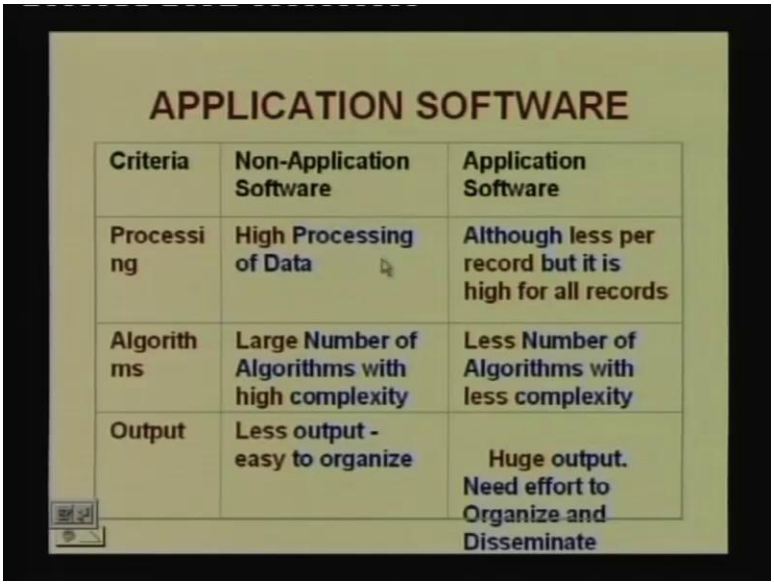

Then usually for processing purpose we have high processing of data and although less per record but it is high for all records all right. So you see as far as application software is concerned the processing is not a very big challenge so the programming complexity usually is low. It is not necessary that you have to write very difficult programs or the algorithm is very very difficult, no. Usually until and unless the situation is really very complex the processing logic is usually not the major challenge. But the challenge is that you have to run this particular processing for the huge data that you have collected and when you have collected huge data the problem that usually occurs that since the data has got variability and various types of data requires may be a slightly different kind of processing.

A simple example: Suppose you are dealing with simple arithmetic, very simple calculation a equal to b plus c. But due to whatever reason somebody has entered an o instead of a 0. See if it is a zero it is very easy to calculate 10 plus 10 equal to 20 but what is 1 o plus 1 o you you cannot... it will not be written as 20, it will written as error. The problem is suppose you are processing 20000 records at the date of night and this particular record is only your 23rd what will happen if adequate check is not given in the programme; at the 23rd record the processing will stop at the date of night and remaining records will not be processed.

Suppose if they are payroll records next day the payroll cannot be printed; I mean the payroll printing will stop and the salary will stop and the entire blame will come to the information processing department saying that they could not deliver on time.

So you see where such a simple problem where somebody has entered 10 instead of 10  1 o but if your program does not take care of this eventuality does not think beforehand that something should be done so that in the first place 1 o could not be entered. Or even if it is entered the program will filter it out, what may happen the record 23rd will not be processed.

See if one record is not processed but out of 20000 all the remaining records have been processed, you have the bulk of the things; bulk of the things are available, one record is not process that one record we can do later on that is not a major problem. So that that means while your categorizing your data inputs you should see that your data inputs are properly organized,

you should see that the processing takes care of all eventualities, 1 o is only one eventuality there may be so many like that and that is why that kind of challenge is there in application processing.

Algorithms there are usually very less number of algorithms in application software the complexity is low but in non-application software there may be large number of algorithms of high complexity, the output is usually less on non-application software and organizing output is not a major challenge. But since application software has huge output you require effort to organize and disseminate. See dissemination of information is although not enough what you call attention we tend to give but it is very important.

Suppose you have printed 20000 pages of report and these 20000 pages of reports are really for 20 departments, if you do not organize your report properly and in proper sequence, simply to identify this report for 20 departments which will go where may take an herculean effort, you may require another program to do it. So you have to think and plan all these things beforehand whenever you are dealing with application software. It is a very important requirement whenever you are dealing particularly with application software.

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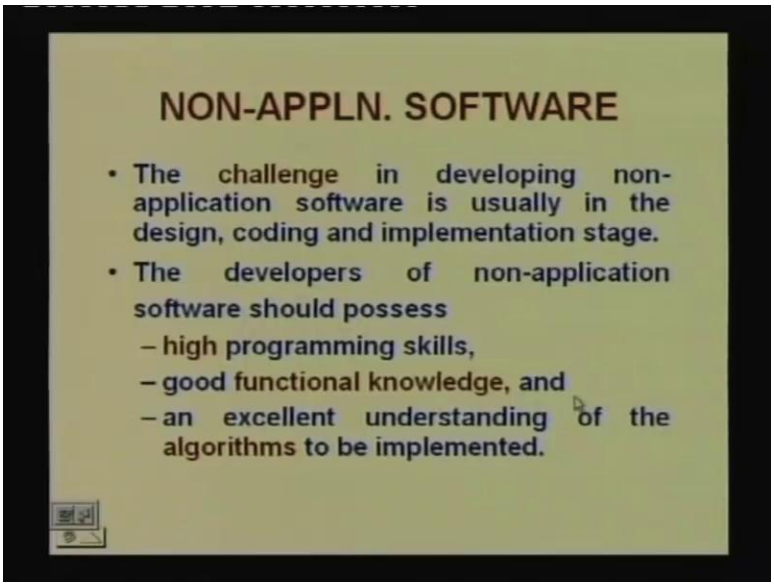

So once again in the non-application software the challenge is in developing. Non-application software is usually in the design, coding and implementation stage. The developers of non-application software should possess high programming, skills good functional knowledge and excellent understanding of the algorithms to be implemented. It is a different kind of challenge.

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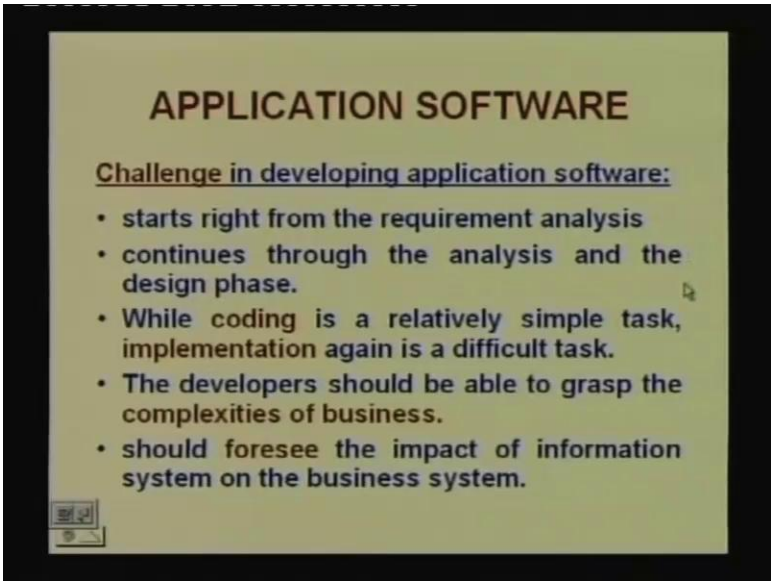


Whereas for application software you know it starts right from the requirement analysis continues to the analysis and the design phase, the challenge is at all phases. While coding is a relatively simple task implementation is a difficult task. So, many a times we say what is there in developing application software after all there is not much of programming logic. But you have to understand the requirements very clearly otherwise what will happen at the time of implementation you will fail you will see people will not accept it. The developers should be able to grasp the complexities of business. So therefore if someone who does not know anything about the organization and tries to develop an application software it is bound to fail because it may be an excellent software but whether the organization is ready for these particular software, can it be implemented in this particular organization very important question and if the answer is no then however good the software may be it may not serve the purpose. And it should foresee the impact of information system on the business system, right. So those are very important requirements for application software.

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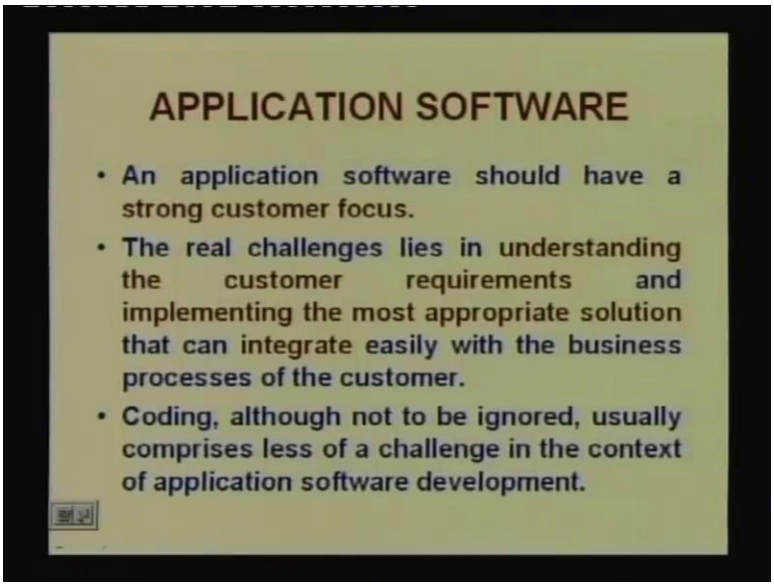


Application software should have a strong customer focus. The real challenge lies in understanding the customer requirements and implementing the most appropriate solution that can integrate easily with the business processes of the customer.

Coding, although not be to be ignored usually comprises less of a challenge in the context of application software development. So it is not so much of a coding challenge but the challenge lies in understanding the customer requirements, implementing the most appropriate solution that can integrate easily with the business processes of the customer.

So we can look at it from two angles: one is the developers' angle who has to understand the customer requirements. but if we look at it from the managements point of view, if we are part of the management then we should see that we should create a situation we should not think that see this is an information system developer he will develop the system for us so it is his job we we have nothing to do; no, not at all. The developer can develop a proper system only when he understands it fully, only when we also being the part of the management participate and try to see that our requirements have been translated to the developer in the most appropriate manner. The interface should be very properly built and this building of the interface is a very important challenge in any information system development process particularly in application software.

Alright? Only then implementation is possible. Finally we should also be ready for implementing the software. Many a time we are not at all we have not given it a thought at all that how the software will be implemented, what changes will be required in my management process, if we do not think about these things probably very good software will be built but it cannot be implemented.

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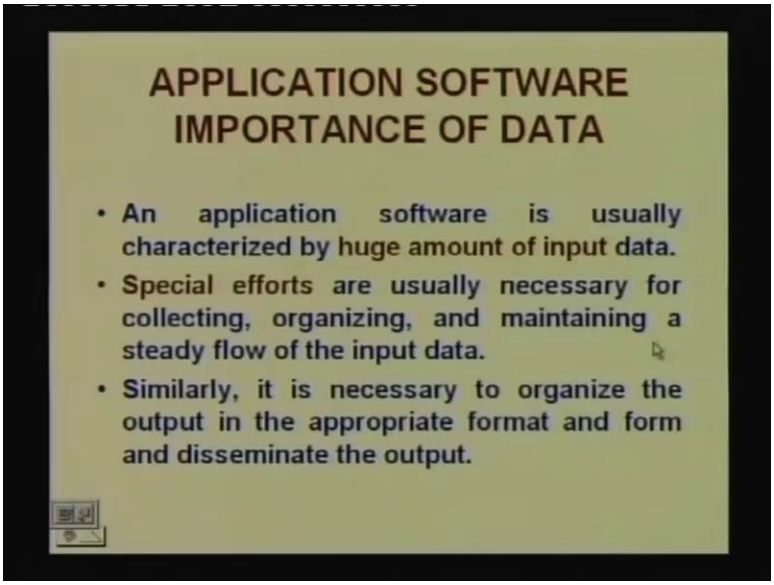


So application software is usually... then the data part characterized by huge amount of input data. Special efforts are required for collecting, organizing and maintaining a steady flow of input. Similarly, it is necessary to organize the output in the appropriate format and form and disseminate the output.

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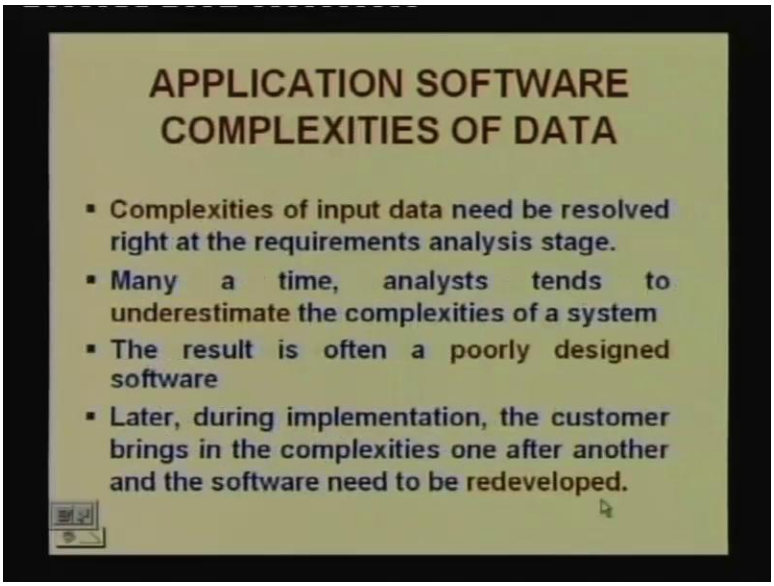


Then complexities of input data need to be resolved right at the requirement analysis phase. Many a times analysts tend to underestimate the complexities and therefore the result is poorly designed software and thereafter the software may require to be redeveloped.

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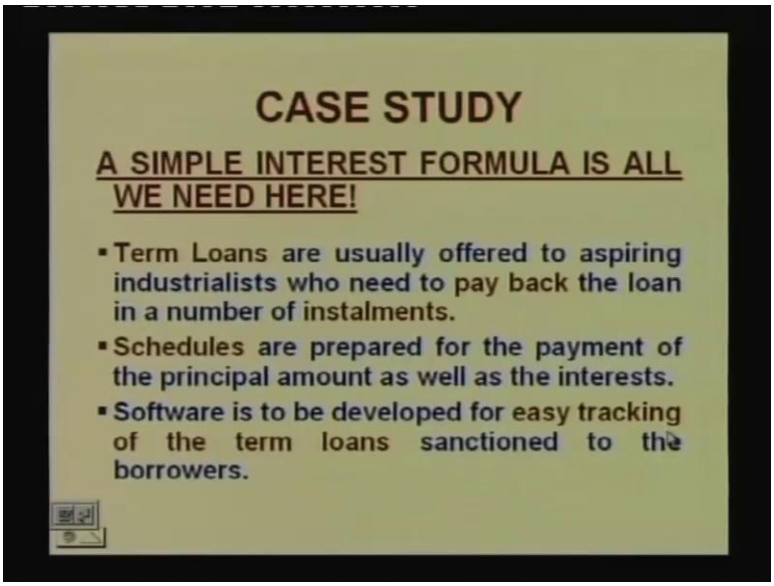


So let us take a very simple: case study through which we try to understand this particular process of previously whatever we have said that suppose we do not understand the complexities

of the system properly or we underestimate the complexities what may actually happen and why should we have to redevelop these particular application systems later on. So this case study is about is a company let us say this company is about an industrial development corporation.

Usually what happens, the industrial development corporation they give term loans. They give term loans to aspiring business houses basically to set up industries. Right? S these are offered to aspiring industrialists who need to pay back the loan in a number of installments. Schedules are prepared for the payment of the principle amount as well as interest.

Suppose you have been invited or a software team has been invited to develop a system application software for easy tracking of the term loans sanctioned to the borrowers so this is the idea. Now most likely the development team would come and irrespective of whatever you may say they think [50:55.....foreign language word] what is there this is a simple interest formula that we need here, nothing else. Because after all what is there, some people are taking low interests sorry the term loans, they have to pay back the term loans as well as they have to pay back the interest. So there will be a schedule and we have to see that the schedule is followed in the appropriate manner. So that is how that is what is the case the very simple one and we can probably use a simple interest formula use our processing, see that the schedule is maintained and as and when people are paying keep tab so that at any point of time we know that whether who are the payers, who are the correct payers and all those things.

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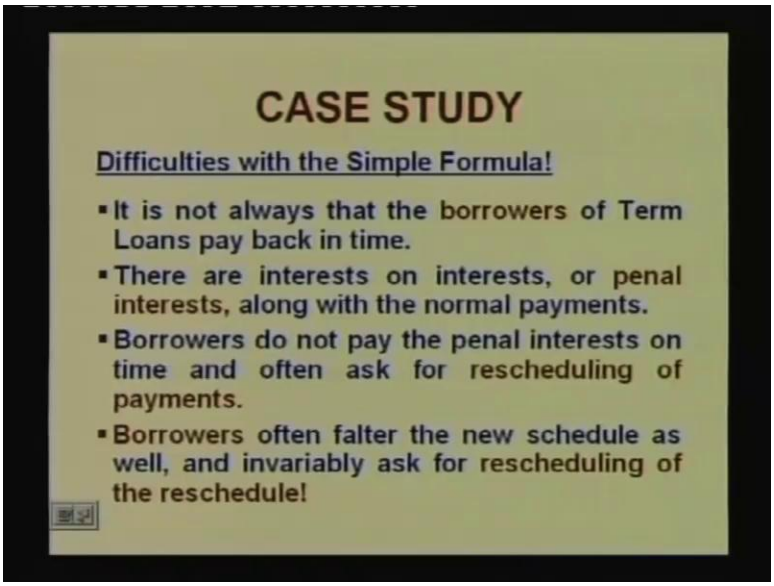


Now the problem is that it is not always so simple it is not always so simple see, there are lot of difficulties. The first and foremost it is not always that the borrowers of term loans pay back in time. many a time you know what happens, people say that okay we cannot payback so what to do you know you reschedule or we cannot pay back; or even there is a question whether what to pay back, you know question on whether we have to payback 20 lakhs no no according to us it is 23 lakhs okay. Even the interpretation of that that means where you have to payback 20 lakhs but according to us I have to pay not 23 it is 17 lakhs but company may interpret it as 18 lakhs so interpretation on interpretations so many complexities may actually arise. So there are interests on interests or penal interests that also may come. Because if you do not pay on time the principle parts as well as the interest part so you may also have interest on interest. So borrowers do not pay the penal interest on time and often ask for rescheduling of repayments so there could be rescheduling and there could as well be rescheduling of reschedule. When the borrowers falter the new schedule as well and there may be rescheduling of reschedule.

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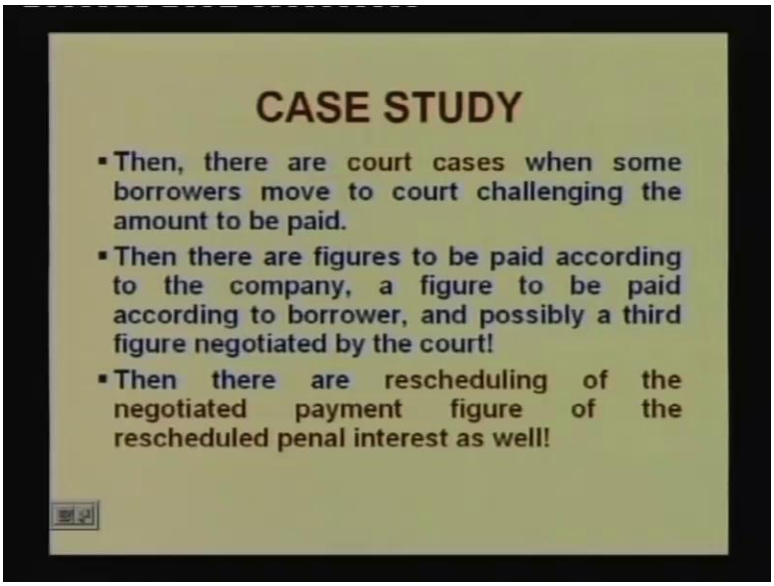


And then there could be court cases. When some borrowers move to court challenging the amount to be paid then there are figures to be paid according to the company, a figure to be paid according to the borrower and possibly a third figure negotiated by the court. So there can be so many things. So there could be rescheduling of the negotiated payment figure of the rescheduled penal interest.

So you see a very simple interest formula does not work and the system can actually be complex. And it is necessary that we understand these complexity beforehand so that we can design application system which is appropriate for a given situation. Fine?

So thank you very much. That will be our introduction number 2. In introduction 3 we shall look at various kinds of information systems and some detail about that, right. Thank you very much.