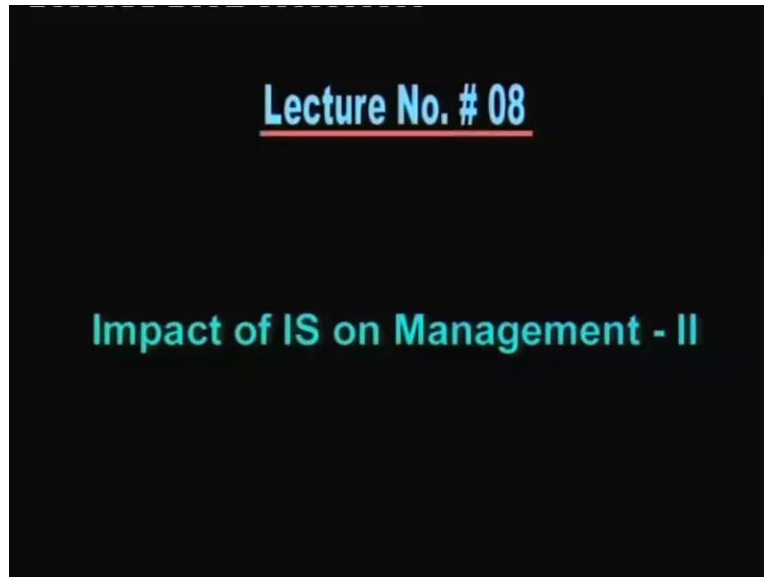


Management Information System
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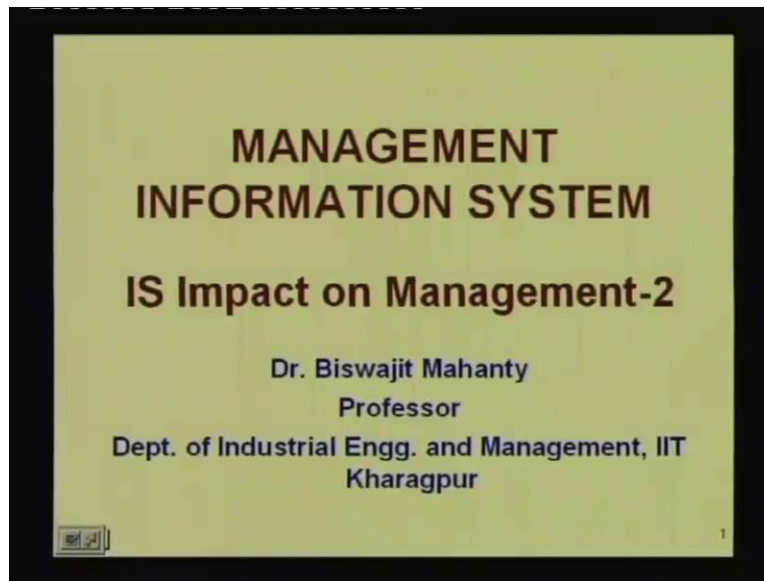
Lecture - 8
Impact of IS on Management – II

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Good morning everybody. Today let us continue with our previous lecture.

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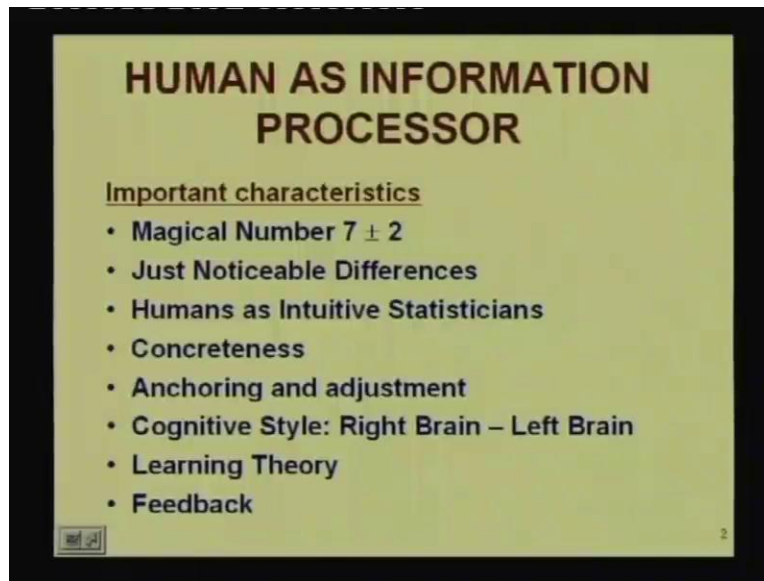
On the impact of information system on management which is the second part. In the first part we have seen the basically the various kinds of management the three waves of management. From there we have seen that today's management systems have become more and more dependent on information and particularly the white color jobs have been completely redefined and this has been possible basically through two very important information systems for management that is the office automation system and the executive support systems. After that we were discussing human as information processor and specifically we were discussing about certain characteristics of human as information processor and essentially there are a large number of them.

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HUMAN AS INFORMATION PROCESSOR

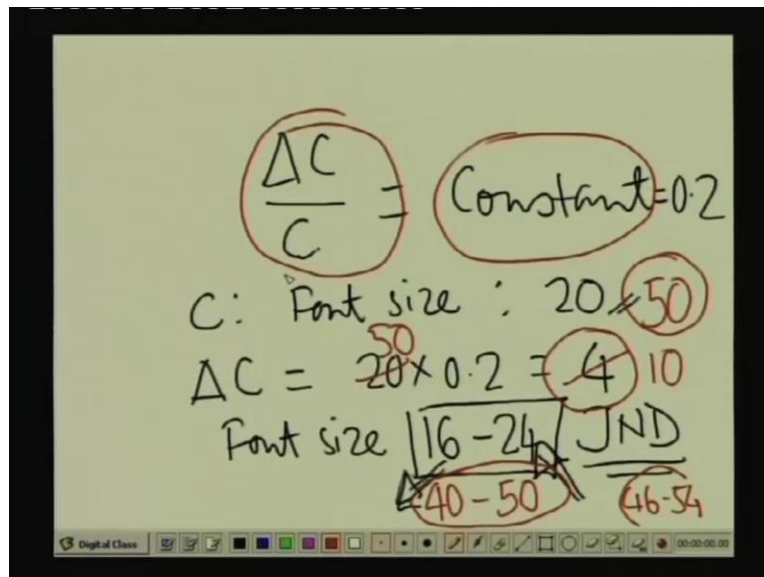
Important characteristics

- Magical Number 7 ± 2
- Just Noticeable Differences
- Humans as Intuitive Statisticians
- Concreteness
- Anchoring and adjustment
- Cognitive Style: Right Brain – Left Brain
- Learning Theory
- Feedback



The magical number 7 plus minus 2 we have seen that this is a limit to the human short term memory. Then we have discussed about just noticeable difference.

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$\frac{\Delta C}{C} = \text{Constant} = 0.2$

C: Font size : 20 ~~50~~

$\Delta C = 20 \times 0.2 = 4$ 10

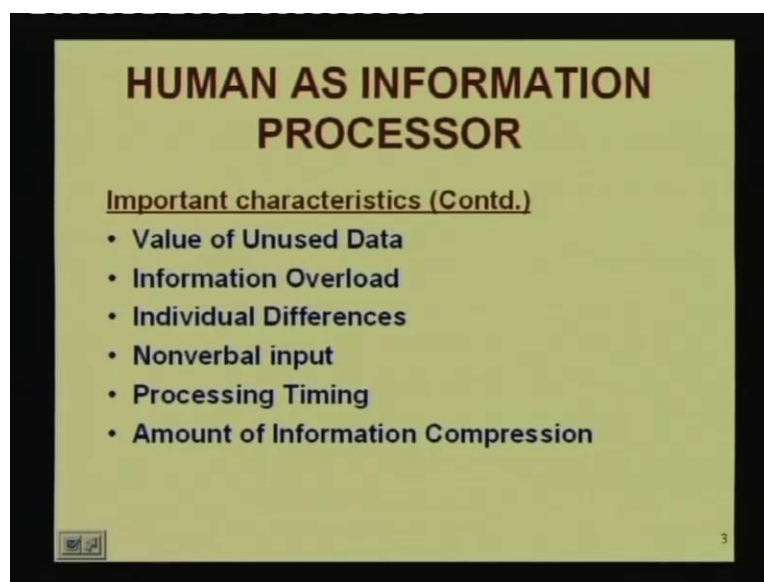
Font size | 16 - 24 | JND

~~40 - 50~~ ~~46 - 54~~

Basically in the just noticeable difference, the essential idea was that Δc by c equal to a constant. So if a particular criteria c is the font size, font size let us say if we are talking of a font size of 20 and suppose this constant let us assume is 0.2. Then we find that Δc comes out to be 20×0.2 that is 4 which means that font size 16 to 24 you know this is we can call as JND or just noticeable difference. That means if we want a noticeable difference in font size we should keep the font size if the original font size is 20 below 16 or above 24. Otherwise it will be just noticeable difference. But continue from here if we want the same distribution where the font size is not 20. But it is actually 50. Suppose it is 50, then this becomes 50 and this becomes 10 all right.

So then this 16 will become actually 40 and this will become 50. So then the just noticeable difference will be 40 to 50 not really 46 to 54. That means it is not this 4 which is important we have to this Δc by c . That is this ratio is going to be important so that is the idea of just noticeable difference. Now let us come back so then we have seen that limits of people as an intuitive statistician. Then we see that people tend to depend more on concrete information and therefore ignore that part of information which is not concrete right. That is what and thereafter a number of them we shall discuss as they come one by one. So this is what we have seen in our previous lecture. Let us now continue with anchoring and adjustment.

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HUMAN AS INFORMATION PROCESSOR

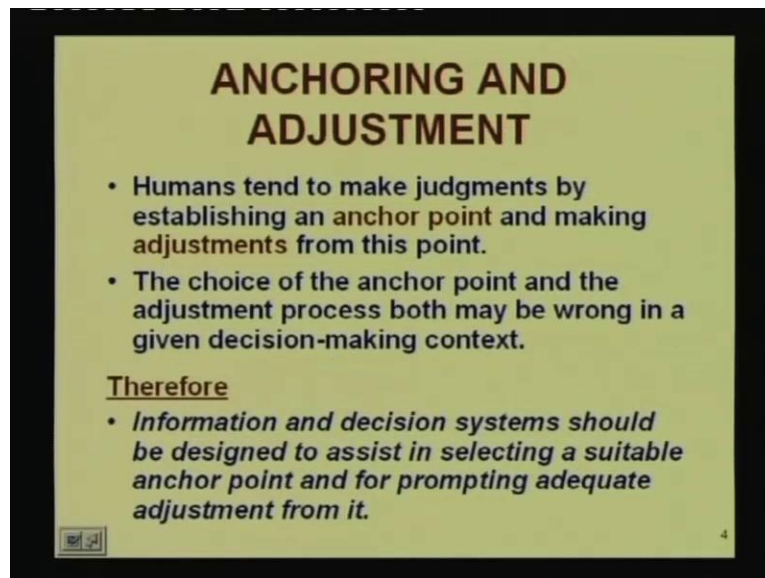
Important characteristics (Contd.)

- Value of Unused Data
- Information Overload
- Individual Differences
- Nonverbal input
- Processing Timing
- Amount of Information Compression

3

These are some of the others which we shall discuss.

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**ANCHORING AND
ADJUSTMENT**

- Humans tend to make judgments by establishing an anchor point and making adjustments from this point.
- The choice of the anchor point and the adjustment process both may be wrong in a given decision-making context.

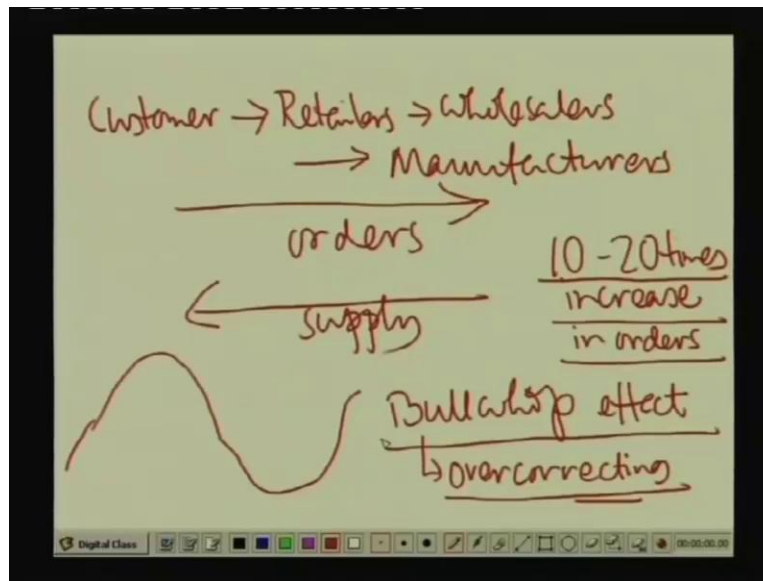
Therefore

- *Information and decision systems should be designed to assist in selecting a suitable anchor point and for prompting adequate adjustment from it.*

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So anchoring and adjustment human tend to make judgments by establishing an anchor point and making adjustment from this point. The choice of the anchor, anchor point and the adjustment process both may be wrong in a given decision making context. So this is an easy way one can say by which people make their decision. But there are sometimes probably an a simple anchoring and adjustment is probably the only way that is available to people to make decisions. Let us try to see an example from a supply chain management situation where anchoring and adjustment plays a very big role.

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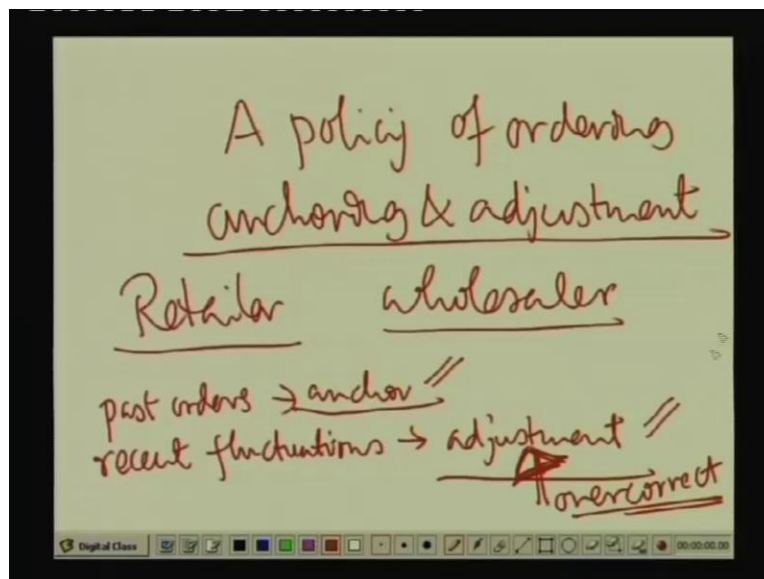
Say let us say in a supply chain condition we have basically a supply chain which consists of let us say customer to retailers to wholesalers to the manufacturers. So this is a supply chain and in this supply chain what happens orders flow in this direction and supply flows in the reverse direction. Now when the customers give orders to retailers give order to wholesalers gives orders to manufacturers and supply in the reverse direction sometimes what happens if there is a slight change in the market with regard to the ordering situation the market can sometime over corrects itself. So say for example the customers due to whatever reason may be due to a panic in the market started giving more orders because it might have been speculated that there will be a short supply of this product in the time to come and customer gives more orders.

So when the customer gives more orders the retailer accumulates them and they find a panic situation that we are getting more orders. Whereas supply are not enough so they in turn start giving more orders even more orders and sometimes we have seen the difference in this ordering cycle as it reaches from customer to manufacturer. There could be 10 to 20 times increase in orders. You know this is a particular phenomenon which is called 10 to 20 times increase in orders as it moves from supply chain from customer to manufacturer and this is called what is known as bullwhip effect. The bullwhip effect what is the reason of bullwhip effect the reason is over correcting over correcting. That means when there is a change in customer order the retailer

tend to order even more and since the supply is not coming immediately because manufacturer has to gear to the excess supply.

Therefore the retailers become impatient and they start ordering more and more. Actually the reverse happens when manufacturer actually makes additional supply and start fulfilling the orders at that time the reversing will happen. The wholesalers and retailers will be now flooded with material basically the material, they have ordered previously and there are not many customers and since there is not many customer orders. They will now order much less than the previous and actually the bullwhip will go to instead of a peak will now go through a trough you see. So therefore if the order if you see the order it increases then it decreases and then again it goes up. So this sort of, you know bullwhip kind of situation occurs in the supply chain management situation. Now who is why the bullwhip effect is happening. See actually if you look at every retailer or wholesaler or manufacturer each of them they are actually using what is known as.

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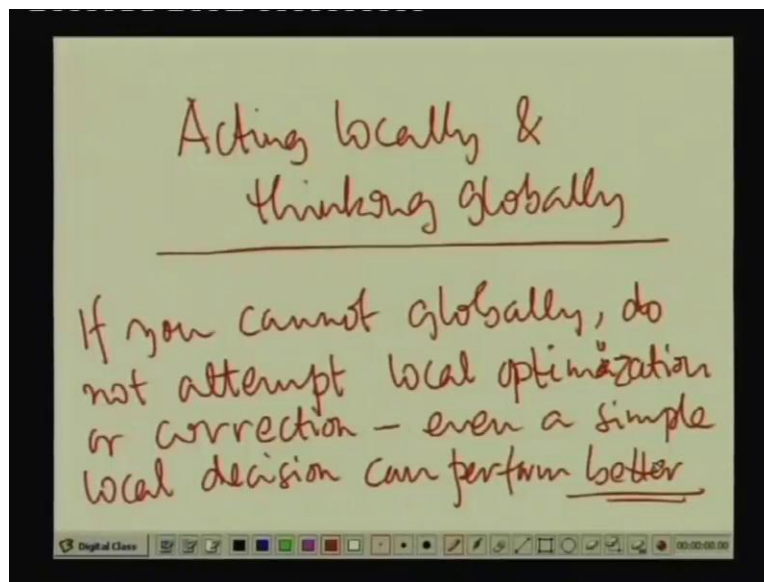


What is known as a policy the policy of anchoring and adjustment at the retailer level also at the wholesaler's level? So at the retailer level the retailers as well as the wholesalers how are they ordering how are they ordering basically they are seeing the past orders as anchor and recent

fluctuations as adjustment? So past orders they are using as an anchor and recent fluctuation they are using as an adjustment. So look at this these anchor which is then adjusted this is where the people are making mistake that is at over correction take place right. Because there is an over correction that leads to a tremendous fluctuation in orders when it moves down the supply chain line.

How to get out of this bullwhip effect a very simple Nye policy if you have tried out that is instead of the retailers if they do not go by this anchoring and adjustment process if they simply follow a Nye decision all the time right. They just decide that okay irrespective of the market fluctuations. We shall order this much you can show or it can be seen that there will be no bullwhip effect mind you that is not an optimizing decision. So even if you are not optimum you follow a simple decision and not do any correction forget over correction not do any correction the curses of bullwhip effect can actually be controlled. So these are some of the things which are which can actually occur in real life in a different way.

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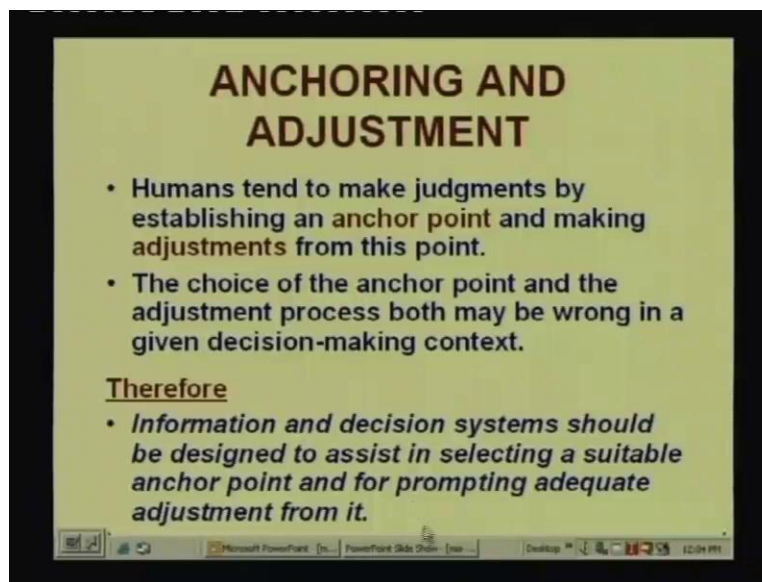


We can say this that acting locally and thinking globally. So if you optimize if you cannot optimize globally do not attempt local optimization or correction even a simple local decision can perform better. So this looks very peculiar to begin with that is if we cannot optimize the

entire supply chain starting from customer to retailer to wholesaler to the manufacturer it is better to not to attempt any local optimization at retailer level or wholesaler level. It may through the whole system out of gear all right.

So this is something very interesting that even a simple local decision can perform better rather than trying to do a local correction or a local optimization all right. This is also an example of bounded rationality but let me again one that every situation is different what is true in a supply chain situation may not be. So in another situation and many a time it has been seen that anchoring and adjustment is probably the only policy that is left to the decision maker in the absence of another good policy or heuristic that is available.

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ANCHORING AND ADJUSTMENT

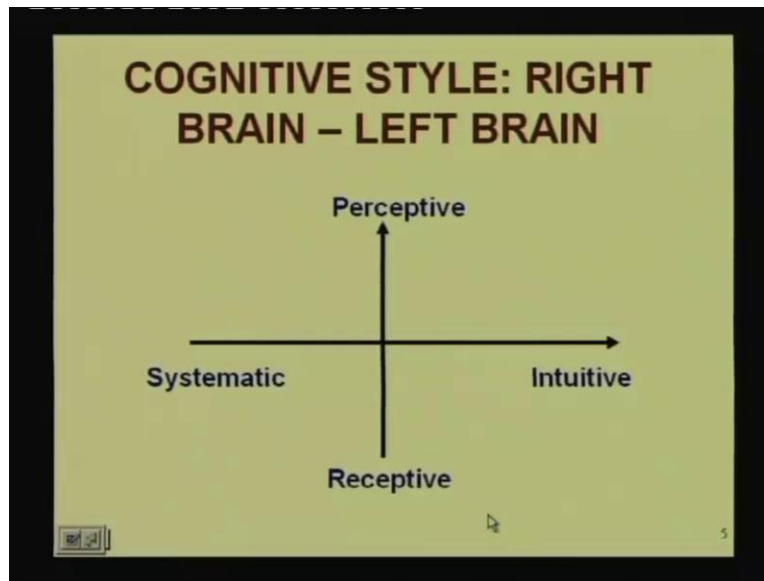
- Humans tend to make judgments by establishing an anchor point and making adjustments from this point.
- The choice of the anchor point and the adjustment process both may be wrong in a given decision-making context.

Therefore

- *Information and decision systems should be designed to assist in selecting a suitable anchor point and for prompting adequate adjustment from it.*

So this is what we have seen and therefore if in the face of anchoring and adjustment information and decision systems should be design to assist in selecting a suitable anchor point and for prompting adequate adjustment from it.

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Then the cognitive style. So we have seen that people can be broadly divided into two categories. The right brain people and the left brain people. The right brain people they are more what you call intuitive right the right brain people. They are more intuitive whereas the left brain people they are more systematic. So this is the difference broad difference on the other side on the other dimension. This is the left brain right brain the on the other side the people could be receptive or people could be perceptive right. So on one hand the perception verses reception and intuition verses systematization. The right brain people they are more intuitive and the left brain people they are the more systematic. Let us try to see this in slightly more detail.

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COGNITIVE STYLE: RIGHT BRAIN – LEFT BRAIN	
LEFT BRAIN	RIGHT BRAIN
Words	Images
Analytic	Intuitive
Sequential	Simultaneous
Active	Receptive
Realistic	Imaginative
Planned	Impulsive

So the left brain people they are they depend on words. Whereas the right brain people they depend on images. The left brain people they are more analytic whereas the right brain people they are more intuitive. The left brain people they process sequentially whereas right brain people they want simultaneous processing right. The left brain people are active the right brain people receptive realistic versus imaginative planned versus impulsive. So you can see that the basic difference between the right brain and left brain people basically comes in the left brain people are basically analytic they depend on models.

Whereas the right brain people they are not so much interested in models. They are more interested in seeing the patterns of data and basically simultaneously you know they are more receptive to a given situation more imaginative impulsive in their decision making. They can actually visualize they are more visionary. But the left brain people they depend on meticulous examination of each you know report each output the modeling methodology the technique the analysis the analysis part they are more planned. So if you really look at the management process more or less the left brain people they follow the management process to almost to the team.

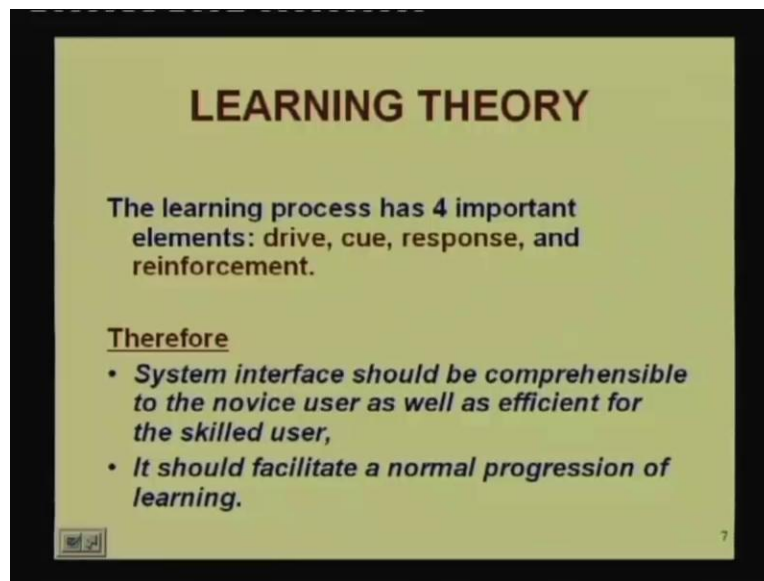
Whereas the right brain people they are very different. However we can see that combinations because you see there are certain x factor in management. That is very important it is not always

that you know you can have the only the left brain people you have to have the right brain people also to obtain the intuition because the intuition is one of the very important part of any management. You may have information but what to do with the information to use it in the most effective manner you have to have a vision you have to have an intuition. So that x factor of management can only be provided by the right brain people.

Now one very important word of caution here although we have differentiated people by left brain and right brain and all that even the so called right brain people are also may be 50 percent right brain people and 50 percent left brain people because this can be actually changed a right brain person. There cannot be any person who is an out and out right brain people right. So you have a through training and through the process of management and the style basically people become somewhere in between it is like a continuum. So a person is very much on the left brain side or a person very much on the right brain side or a person somewhere in the middle all right.

So every person is a combination of left brain as well as the right brain characteristics and it is better to place people on the continuum of left brain right brain rather than categories someone as a just left brain person or just right brain person. So that is what the thing is. Now this is has a very important definitely your implication on information processing that is if we are having the right brain people we must depend on the processing of data all right. We must try to give them the raw materials of data. So it is the left brain versus right brain people, they that will depend on how they will go about the processing of information whether they will depend on models or whether they will like to see the patterns in the raw data.

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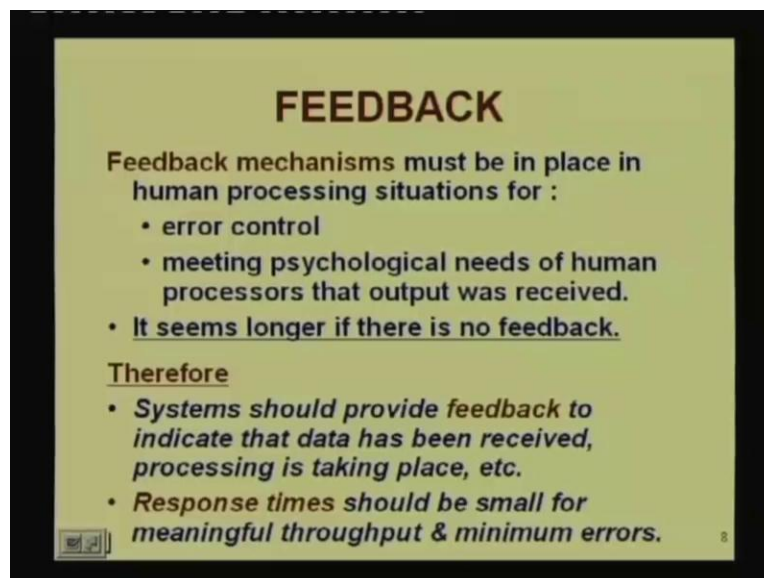
Now the learning theory the basically the learning process has four important elements the drive, the cue, the response and the reinforcement right. So you have to have a drive and there are certain cues which will actually help you towards the learning process and then what you have to see that on the basis of these cues what the kinds of responses that we are getting are. And if the response is not proper the desired ones then we have to go for reinforcement's right. So the basic idea that the subjects of the participants in learning they have to have driven and there should be certain cues. These cues can actually change based on the response through a process of reinforcement. So these are the four important elements and if a person does not have too much drive for learn then we have to see what can be done so that the drive is actually increased. If the cues are not proper we have to provide the right kind of cues, so that is the basic idea.

Let us try to understand an example from an user interface user interface basically refers to that portion of an information system which is basically serves a as an a intermediary between the system and the user. So suppose you are new to a particular software package, let us say the Microsoft word then you see you are like a novice user. You do not know how to use Microsoft word then you should have sufficient cues all right like you know the highlighter buttons and menus in the screen and you have to drag and drop and everything that is possible. So that you can you can become you know you can still use the Microsoft word package without much of

training. So that means the information system should provide cues to the novice user which are comprehensible through the window system menu system and everything but the same thing which were very helpful to you while you are a novice user may become an impediment when you have become an expert or a skilled user.

Basically if you have to highlight something or you have to change something through the use of mouse and drag and drop every time you may feel that you know we are unnecessarily getting delayed too much of interaction all right. This is where you require a common line interface may be through key strokes you can easily do certain things which and do not have you have to use mouse the drag and drop the highlight. You know all these things you note it do not use. So there should be short cuts by which if you recall or remember or memorize them. You can be much more efficient you can do things quickly and efficiently. So basically the efficiency and effectiveness are more important to a skilled user all right. So therefore you know cues will keep changing they get reinforced based on the response. So as learning proceeds the people should get different kinds of what you call reinforcements or supports when you become a skilled one. So therefore it should facilitate a normal progression of learning so that is the basic idea and that sort of support should actually be available.

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FEEDBACK

Feedback mechanisms must be in place in human processing situations for :

- error control
- meeting psychological needs of human processors that output was received.
- It seems longer if there is no feedback.

Therefore

- *Systems should provide feedback to indicate that data has been received, processing is taking place, etc.*
- *Response times should be small for meaningful throughput & minimum errors.*

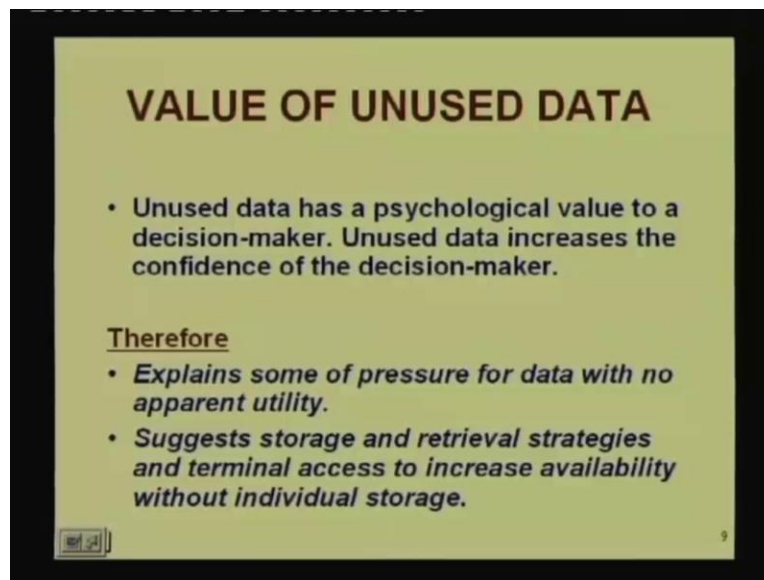
Then let us see a very important component that is called feedback. The feedback mechanisms must be in place in human processing situations for error control meeting psychological needs of human processors that output was received and finally it seems longer. If there is no feedback, see suppose you are running a program and you have entered some input but you see practically nothing happened right. You are asked to enter an input in a particular program say you are may be playing a game and in this game you are asked to enter a value you have entered a value. But nothing happens. The screen remains as it is and you can since still see some value is there. But whether the system has accepted or not you were not clear. Invariably you will find under such situations 90 percent of people will press the return button. Many times you know what may happen because you see the system is expecting only one return. If you are putting the return two three times depending on how the program is return these might be also taken as your next decision.

May be in the process of the interactive game play you may have to enter decisions number of times and if you have press the enter two, three times the system may have interpret it. If the software is written that way that the same decision you are also continuing in the next iteration and also the next iteration. So these are some of the difficulties that the information systems can sometime face if the feedback considerations are not properly taken care of. Essentially the idea therefore is that a proper feedback should be actually be given right there should be a feedback that yes thank you very much your entry or your decision has been entered or accepted by the computer. A very simple example, let us try to see that a program which takes somewhere around two minutes if it simply runs for two minutes without showing any feedback that the program is running invariably the people think it seems very long the program takes too long to process. That kind of complaint you will hear from people that it takes too long.

But if you give a progress bar that, okay the program is proceeding since the progress bar is given there should be more processing. And what is two minutes may actually may take? Now 2.2 minutes or 2.3 minutes all right. But even then since a progress bar is continuously showing the amount of processing that has already being done the same people who are complaining earlier that it seems longer they will say it has become all right now. So this is a classic experiment that can be conducted that even a when you have increase the time of processing

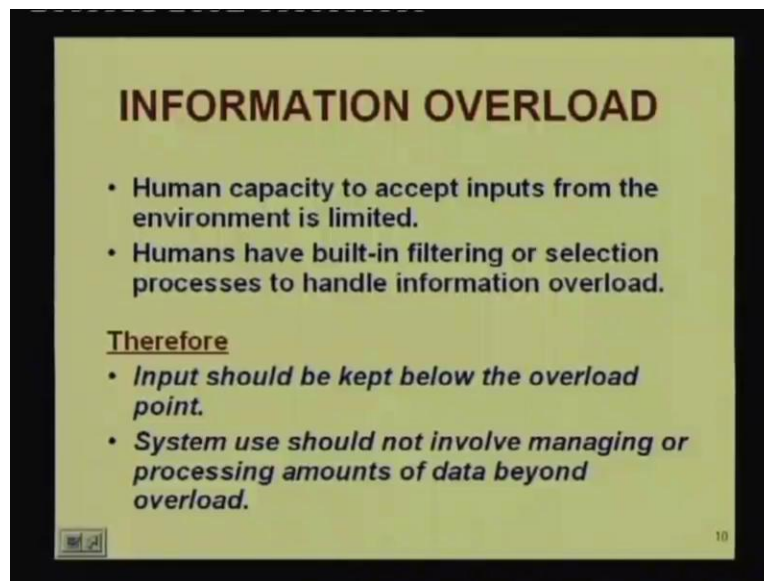
people are happy right because there is feedback. So feedback you know it is always necessary that we give feedback whenever we are involving people or human for information processing. So therefore the system should provide feedback to indicate that data has been received processing has taking place etcetera the response times should be small for meaningful throughput and minimum errors. So these are some of the very important considerations with regard to feedback.

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Then the value of unused data unused data has a psychological value to a decision maker unused data increases the confidence of the decision maker right. Therefore it explains some of the pressure for data with no apparent utility suggests storage and retrieval strategies and terminal access to increase availability without individual storage all right. So that means you know when it comes to the managers the managers think that they should have even if someone. If you do not give that particular data to somebody he may think that since I do not have that particular information probably I am not going to be able to make my decisions better. So even if that is not useful, sometimes concession has to be made and just to increase the confidence of the decision maker, it is better that we provide the manager with unused information also at times.

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INFORMATION OVERLOAD

- Human capacity to accept inputs from the environment is limited.
- Humans have built-in filtering or selection processes to handle information overload.

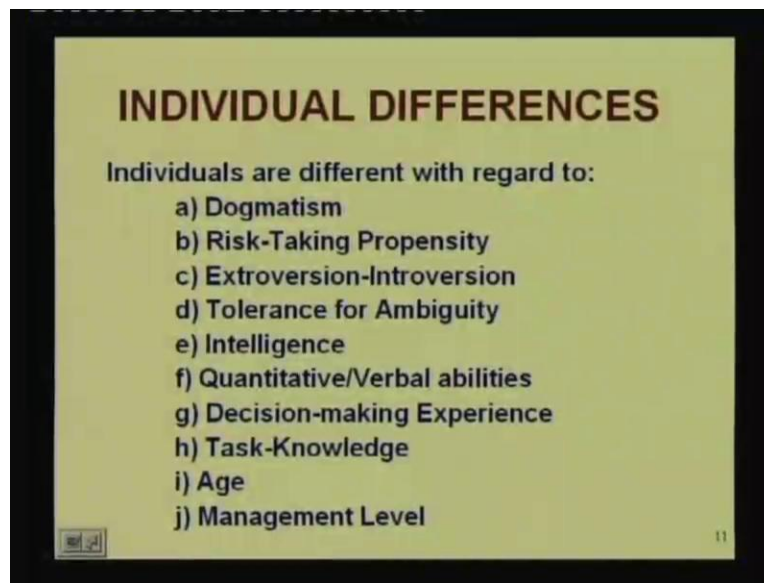
Therefore

- *Input should be kept below the overload point.*
- *System use should not involve managing or processing amounts of data beyond overload.*

Then related concept is information over load. See what happens in modern organizations particularly at the top management because they have to cater to a large hierarchy there could be what is known as information over load because human capacity to accept inputs from the environment is actually limited. Human have built in filtering or selection processes to handle information overload. So therefore input should be kept below the overload point system use should not involve managing or processing amounts of data beyond over load. Now what is an overload and what is not an overload?

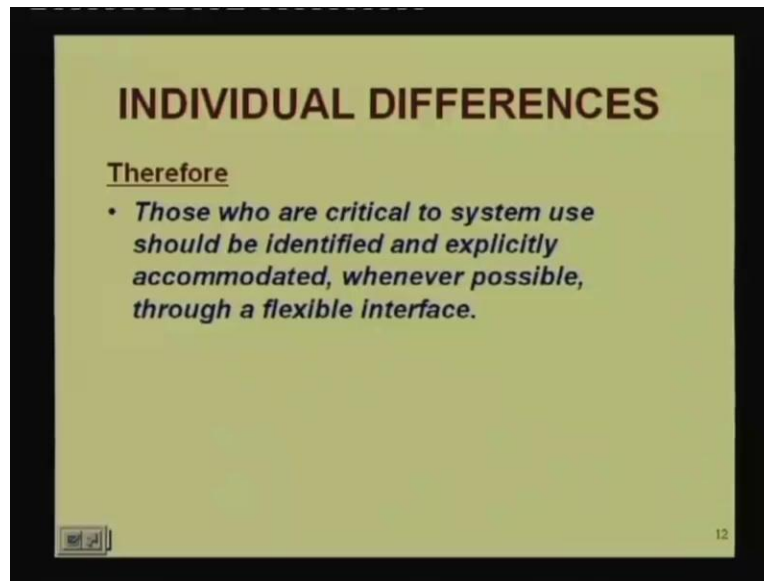
This is again a very, very important question because every person processing ability of information is not enough not same. So if you are giving information to people you know you have to know that the overload point could be different. There could be individual differences between the decision makers with regard to the over load point all right. So whereas it is better to give some amount of unused information but too much of it could be an information overload. So trade-off is very much important give information summarize information give exceptional information whenever is required always keep in mind that there should not be too much of information.

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Then there are individual differences. There are a large number of factors here the individual preferences or differences could be in terms of dogmatism, in terms of risk taking propensity, extroversion versus introversion, the tolerance for ambiguity intelligence quantitative versus verbal abilities ,decision making experience, task knowledge, age, as well as management level all right. So one person could be more dogmatic one person may be able to take more risks than the other the person may be more extrovert the other person may be more introvert. Then ambiguity. The ambiguous information the same tolerance may not be there in every manager there are various intelligence levels which we have discussed earlier. Then the quantitative and verbal abilities could be different, decision-making experience can be different, knowledge of the task could be different, age is a very important thing age of the manager could be different and they may be at different management levels.

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INDIVIDUAL DIFFERENCES

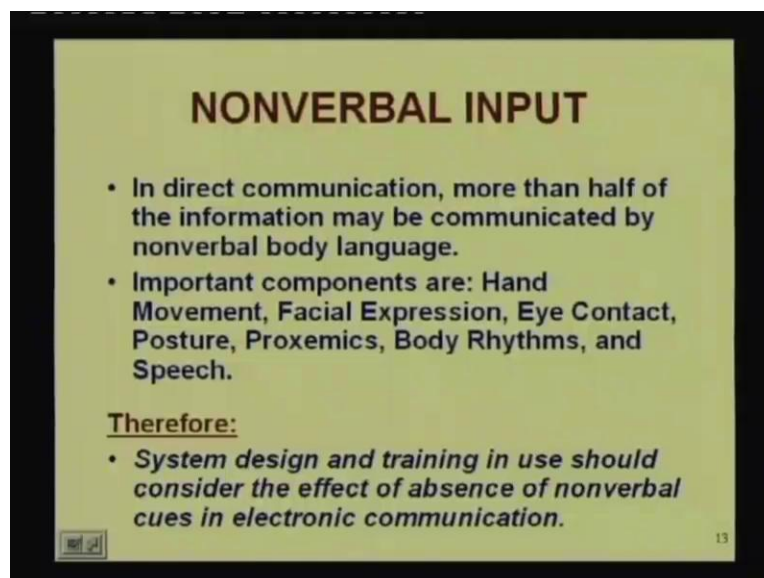
Therefore

- *Those who are critical to system use should be identified and explicitly accommodated, whenever possible, through a flexible interface.*

12

So therefore those who are critical to the system use should be identified and explicitly accommodated wherever possible through a flexible interface. So we should identify or we should know that there are individual differences and there are people who are critical to the system use. And because of the fact that they are critical to the system use they should be explicitly accommodated wherever possible through a flexible interface right the interface should be flexible.

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NONVERBAL INPUT

- In direct communication, more than half of the information may be communicated by nonverbal body language.
- Important components are: Hand Movement, Facial Expression, Eye Contact, Posture, Proxemics, Body Rhythms, and Speech.

Therefore:

- *System design and training in use should consider the effect of absence of nonverbal cues in electronic communication.*

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Then nonverbal input, see this is one of the very important reason why it is very much necessary that there should be the information system should also you know is cannot support everything. In fact we might have said in the beginning that there could be formal versus informal information systems. The formal information system is the part of the information architecture of an organization. But beyond the formal information system there are also informal information systems in organizations. And these informal information systems basically are the grape wine the rumor mill the you know the through the manager meets. His own group may be in the evening parties evening gatherings and the information that he collects from there also forms a very, very major part of his you know information base. Why this is basically, so because in direct communication more than half of the information may be communicated by nonverbal body language. Here the important components are hand movement, facial expression, eye contact, posture, proxemics, body rhythms and speech right. So how a person is reacting to a given question can reveal many of the things compared to what he or she is actually saying all right.

So you ask a very innocuous question the answer the person gives could be equally innocuous. But his body language could give in much more, then, the simple question answers right. The written document or the information systems computers cannot reveal these and we must be aware of this all the time system design and training in use should consider the effect of absence of nonverbal cues in electronic communication. Now this is one of the very, very major what you call short coming of information system that nonverbal input cannot be put into cannot put into the information system we must keep it in mind. So as for as possible try to compensate through more details through something which so suppose in the oral communication. We may omit many of the things the context may be omitted. But in the written documentation we should make it more formal because of this reason because lots of cues which are automatically available through verbal communication are actually missing in the computer context.

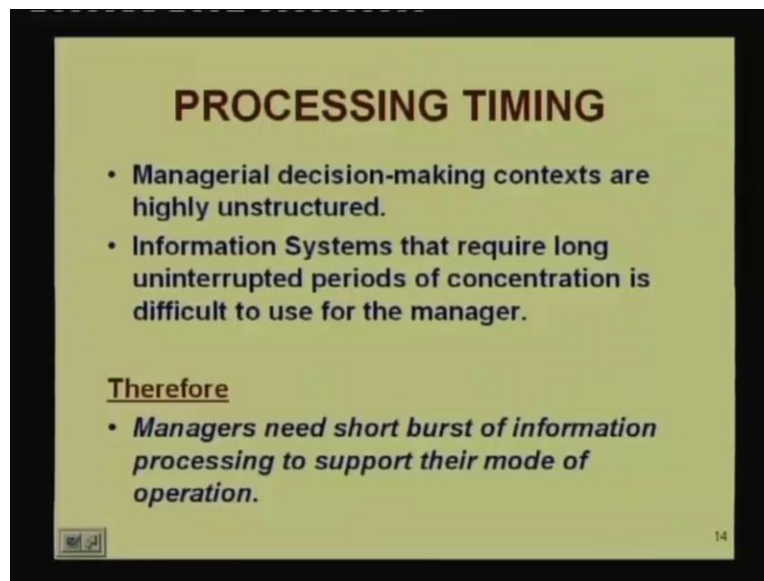
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PROCESSING TIMING

- Managerial decision-making contexts are highly unstructured.
- Information Systems that require long uninterrupted periods of concentration is difficult to use for the manager.

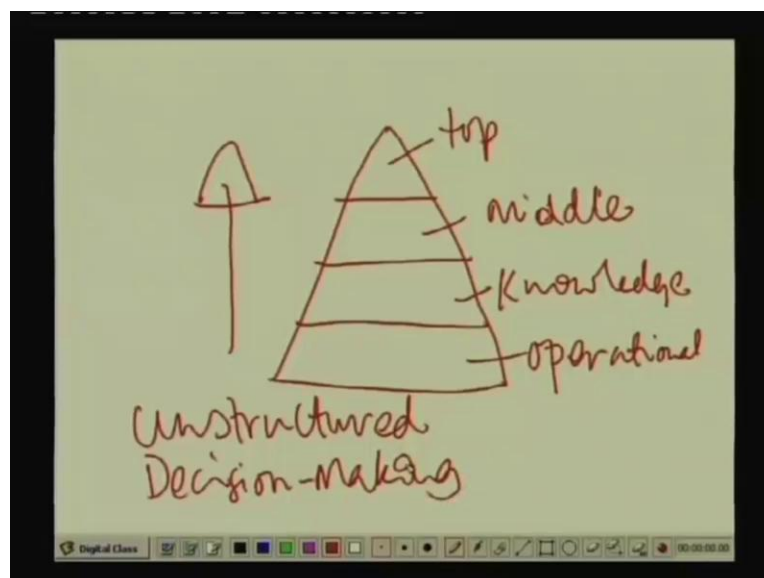
Therefore

- *Managers need short burst of information processing to support their mode of operation.*



Then the processing timing managerial decision-making contexts are highly unstructured. Information systems that require long uninterrupted periods of concentration is difficult to use for the managers right. So basically managers need short bursts of information processing to support their mode of operation. So you see these structure versus unstructured information processing or decision making context are going to increase as you move up the information system triangle right that means if we see this.

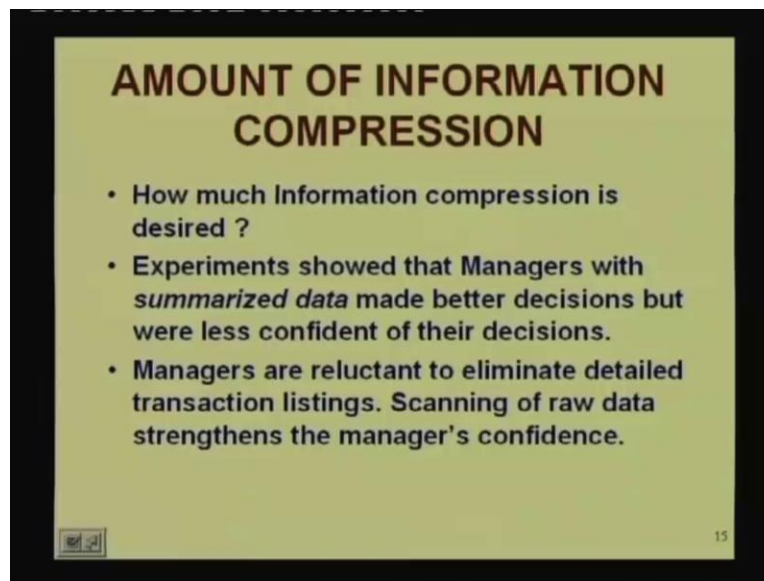
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So basically what is basically I am trying to say is this that these are the different levels of management. This is the top management this is the middle management this is the knowledge level and this is the operational level. So what is happening as we are moving up we see the we are having more of unstructured decision making right. So as we are moving up from the operational level of management to the top level of management through the middle level and knowledge level of management we see the decision making become more unstructured. Why it is so it is so because the higher level of management they have to you know really cater to a very large. What you call a span and lot of information from different kind of systems are actually coming.

And we have a situation where we have to reconcile we have to weigh the information with not only the within the organization but also outside the organization that of competitors that of environment and finally integrate. This is not an easy process there are lots of uncertainties involved and because of that it becomes more and more unstructured and complex right. So therefore if you want a person of top management to have long uninterrupted periods of concentration probably it will not be possible because the person will be so busy that he cannot give such a time. So it is better that the managers are provided with short burst of information processing to support their mode of operation rather than have a long uninterrupted periods of concentration.

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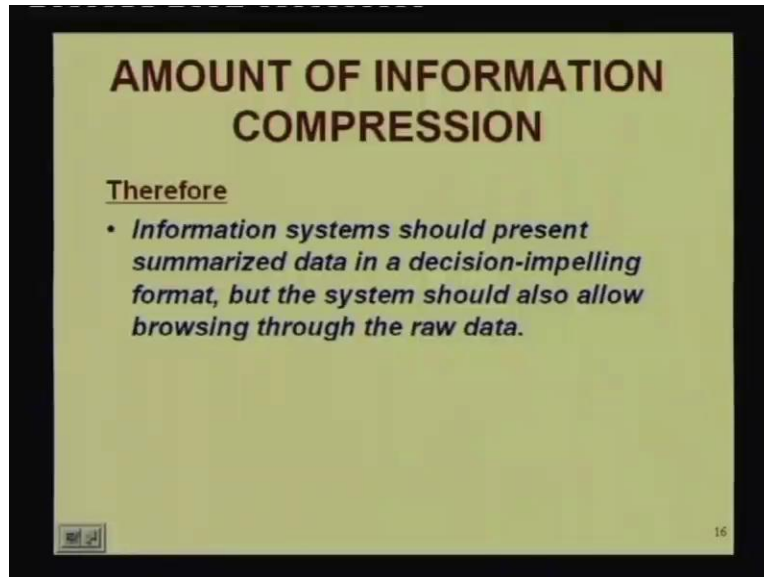


Then amount of information compression how much information compression is desired. Basically here we are talking of filtering summarizing exceptional data that are a bench mark of management information systems. Experiments have showed that manager with summarized data made better decisions but were less confident of their decisions. So managers are reluctant to eliminate detailed transition listings scanning of raw data strengthens the manager's confidence. So this is something very interesting on one hand we are saying that we should reduce information overload we should summarize the information we should give exceptional information. So that the there is no information overload and it is a very basic strength of MIS design that we identify which report is required by whom and accordingly give information in that manner.

On the other side we are saying the managers are require unused data they become more confident. If you gave them more information even if they do not use the data or sometime some managers which are more right brain in their nature may like to go through the raw data raw data in a try to see the patterns of the raw data. So the basically one has to come to a trade-off here and really make a situation where the manager uses the summarized data uses the exceptional information but the raw material the raw data is also available to the manager and if he requires he can actually glance through that. So make it available make it at its discretion whether you

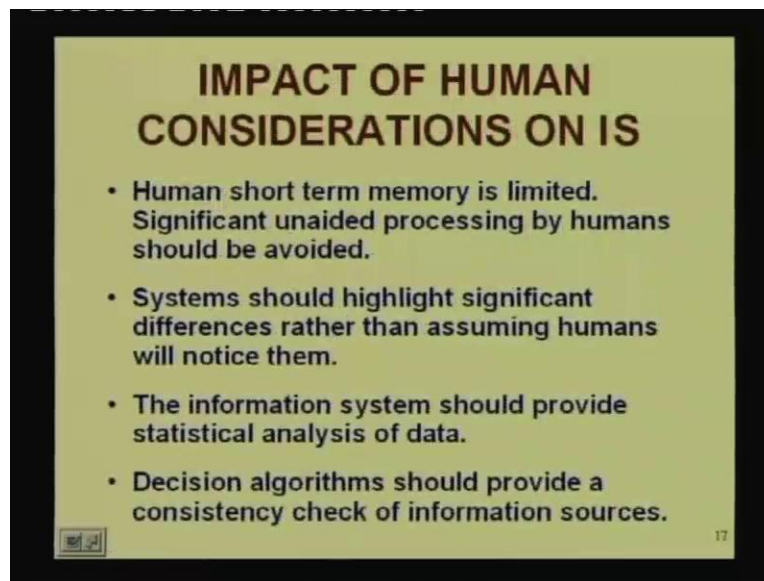
would like to go for it or not there it should not be that that information is not at all available to the manager so that is how the trade-off should be actually created.

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So information system should present summarized data in a decision-impelling format. But the system should also allow browsing through the raw data. That means the basic output is in the summarized form in a decision-impelling format but the system should allow browsing through the raw data also.

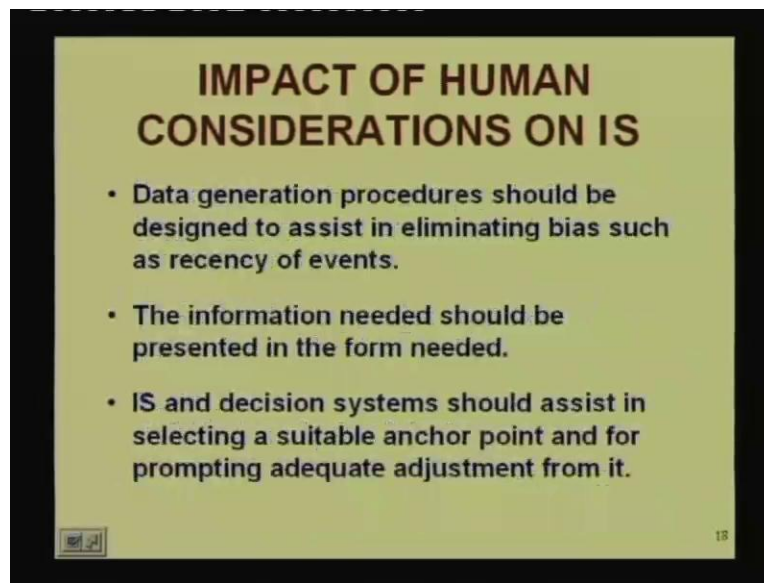
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So now let us summarize what we have really seen through all these considerations of human as information processor. Very beginning human short term memory is limited that is that seven plus minus two significant unaided processing by human should be avoided. So whenever we have the human processing information they should get certain aids like external memory in the form of computers in the form of the blackboard or they should be given certain processors. Even a simple calculator can help in a big way system should highlight significant differences rather than assuming human will notice them.

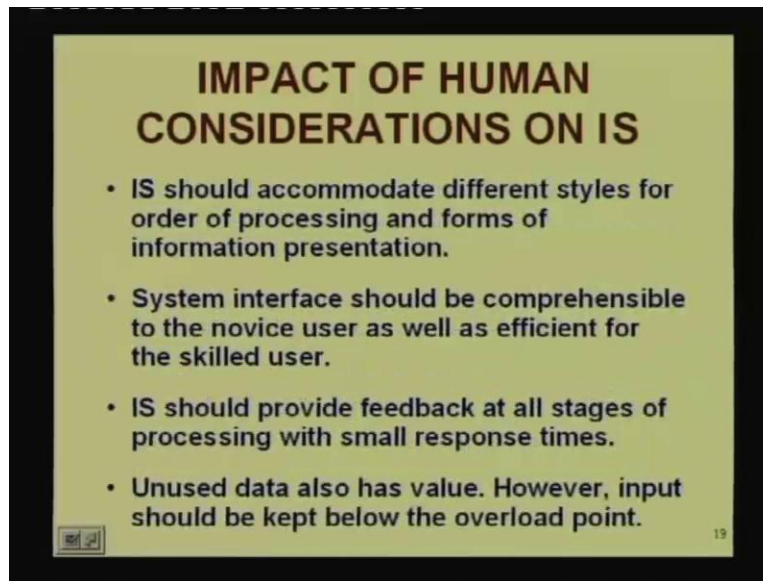
So do not keep things to chance if you want to highlight a difference remember that there is a limit to just noticeable different and therefore if you want certain things to be highlight, highlight by a contrasting color highlight by a bigger font not just slightly bigger quiet bigger than the just noticeable difference. The information system should provide statistical analysis of data. So the people as an intuitive statistician are rather poor they do not understand the variances since they do not understand the variances. So the information system should provide a statistical analysis of data wherever required. The decision algorithms should provide a consistency check of information sources right because if that is not done they the entire processing could be with wrong information sources.

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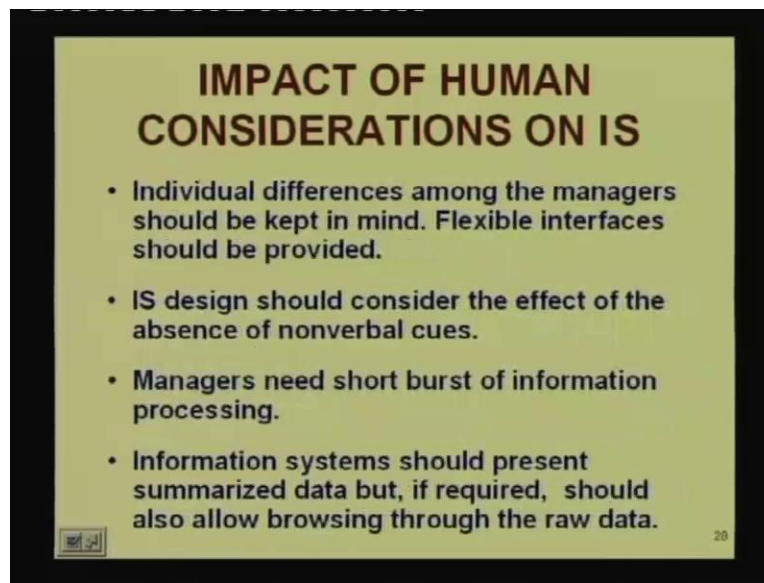
Then the data generation procedure should be designed to assist in eliminating bias such as the recency of events right the data generation procedure should be designed to assist in eliminating bias such as recency of events. Then the information needed should be presented in the form that is needed if that is not done, what may happen then we may have information which are based on certain quantitative units like cash etcetera and lot of other qualitative thing about the information may actually be missed. Then information system and decision system should assist in selecting a suitable anchor point for promoting adequate adjustment from it right. So anchoring and adjustment is a very well-known decision making strategy or heuristic. But we have seen that many a time this could be a pitfall as well right. So if where it is not pitfall we should identify them and provide the information system support so that such anchoring and adjustments can easily be done like the administrative model of a decision maker we have seen in the budgeting exercise where we have no other option. But to go for the budgeting exercise based on the previous year's budget in that case a suitable anchor point and adjustment should be possible to have.

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Then information system should accommodate different styles for order of processing and forms of information presentation. System interface should be comprehensible to the novice user as well as efficient for the skilled user. So once again the interface should not be only for the novice users or only for the skilled user. If it is only for the skilled user like the unique system what happens a novice would require a very long time to learn right. But in the widows system many a times we have seen that if you are a skilled user you may feel little embarrassed because you may have to take more time to do routine task for which a simple command could have done. Then information system should provide feedback at all stages of processing with small response times right. So feedback should be provided if either is no feedback it can seem longer and therefore you must remember that human require feedback whenever there is an information processing. Unused data also has value however input should be kept below the overload point right. So give unused data, give facilities for browsing but should be careful that information overload limit is not crossed.

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Then individual differences among the manager should be kept in mind flexible interfaces should be provided. Information system design should considered the effect of the absence of nonverbal cues because there are lot of body languages which are very important on the management context; in the context of informal information systems. But in formal information systems where we are designing the information architecture of a company or an organization we should see that such nonverbal cues are actual absent and therefore make the document more formal give more details, so that the information can be processed in the more appropriate manner, then managers need short burst of information processing that should be kept in mind. Information system should present summarized data but if required should also allow browsing through the raw data.

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Then let us see a new topic that is the role of senior management in information system right. Then some of the very basic questions that managers usually ask as they are usually less informed about information systems. Is the technology running away from us? Are we spending too much? What is the return on investment ROI? How to measure the return is our information system director qualified enough? Do we have long range direction and strategy? What is the payoff from the top management involvement? So whenever we are involving senior management in the information system we should see that the questions answer to these questions is available. If they are not available since the senior managers are less informed about information system? What may happen the information system has a function may actually be ignored by the senior manager because a very important point the senior managers want to see? What is the return on investment and how to measure this return? So simply giving some qualitative things that with information you will have this you will have that you will have the computer on your desk. You can see anything that you like but okay fine we are having all these. But what is the use how best we can utilize information all these information in the best possible manner.

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ROLE OF SENIOR MANAGEMENT IN IS		
Yes to	Firms with unsuccessful IS development	Firms with successful IS development
Executive Steering Committee	23.1%	55%
Written plans	23.1%	60%
Development Priorities	46.2%	90%
Funding Committee	38.5%	70%

Now here is an example of between firms with unsuccessful information system development and firms with successful information system development. So yes to executive steering committee we can see that 23.1 percent of the firms. This is about a study that has been done sometime in US that executive steering committee was present on 23.1 percent. Here 55 percent written plan about information system 23.1 percent 60 percent development priorities are set 46.2 percent in unsuccessful IS development 90 percent in successful information system development funding committee 38.5 percent seventy percent. So you see these are some of the things that are, there is a written plan there are development priorities there is a funding committee and there is an executive steering committee. So when these are yes this shows the commitment of the senior manager or management to the development of information system. So wherever we have unsuccessful information system development invariably the values are quiet low whereas the values are quiet high in the firms with successful IS development. So in other words you can say that where the senior management is very much involved they have taken an active role and they have taken an interest in the information system processing or development it has more you know propensity to be successful.

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CEO INVOLVEMENT LEVELS				
Activity	Approve	Insist	Review	Delegate
1. Long Range IS plan	Yes	Yes		
2. Determination of IS Portfolio			Yes	
3. CEO DSS Specifications	Yes			
4. IS Budget and resource allocation			Yes	
5. Security/Backup Plan		Yes		

Then let us see that CEO involvement levels so there are we have identified four things. That is an approve, insist, review and delegate right. So first is the long range I information system plan. So this is where the CEO should insist and the CEO the chief executive officer should approve. That means that a long range information system plan that leads to an information architecture of an company is a strategic decision and that should be basically passed by the chief executive officer. Determination of IS portfolio that should be reviewed by the CEO, then CEO DSS specifications that must be approved by the top man. Then information system budget and resource allocation that should be reviewed by the CEO. Then security and backup plan, the CEO must insist that CEO must see that there is such a security and backup plan for an information system.

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CEO INVOLVEMENT LEVELS				
Activity	Approve	Insist	Review	Delegate
6. IS Mission statement		Yes		
7. Selection of IS executives			Yes	
8. Technological Risk Assessment	Yes	Yes		
9. Design of Appl. Systems				Yes
10. H/W & Software Selection				Yes

Then the information mission statement should be insisted selection of information system executives should be reviewed the technological risk assessment should be insisted as well as approved. Then finally the design of application software and hardware and software selection can be actually delegated. So you can see that some of the very important thing like a mission's statement they are the technological risk assessment as we have seen in the previous slide the long range information system plan a security and backup plan should be insisted. The long range IS plan and DSS specifications for CEO should be approved the determination of IS portfolio. And budget and resource allocation should be reviewed and also the selection of information system executive can be reviewed. But only the design of application system and hardware and software selection can only be delegated. So thank you very much for today's lecture. In the next class we shall review the hardware software and the communication needs of an information system. Thank you very much.