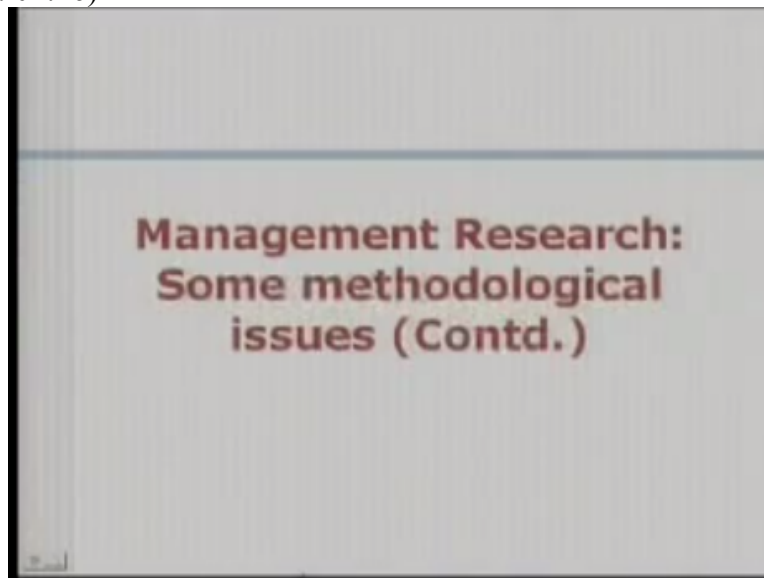
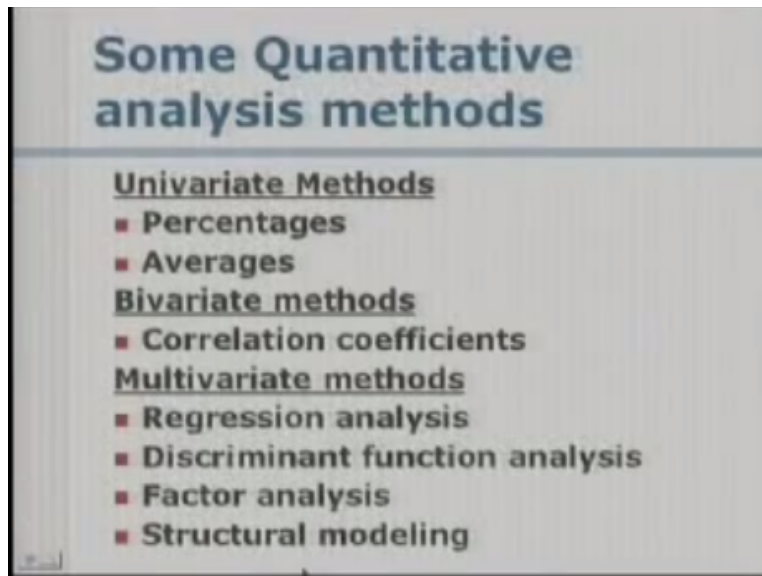


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A Video Course  
On  
Management Science  
BY  
Prof. Anuradha Sharma  
Department of Humanities and  
Social Sciences, IIT DELHI  
Lecture # 29  
Management Research: Some  
Methodological Issues  
(Contd.)**

We are discussing management research.  
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We are seen that there are number of methods for collection of information data in management research. So now we move on to the next part or the discussion today,  
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First we will discuss the analysis plans, and some quantitative techniques that we are using for management research. When we are using any kind of quantitative analysis, these basic plan of the course begins with the type of scales which we are using and the best from that, we decide it whether our objective needs a univariate methods or by variate methods or multivariate methods. So this a decision based on.

the disaster and the purpose of , the research that you are trying to carry out, when I say this, what I trying to mean is, is it just for a very quick report, is it for a decision making, or is it for some kind of a evaluation of some government policy, is it for a phd dictation, or is it a consultancy report, so in all these situation we are using some aspect of management research methods.

So we have to sometimes the requirement may be, that we are just queuing one variable analysis and so the percentages and averages may suffices. For example, how many people are poor, how many people are below the poverty line, how many are the middle class, how many are above that, we are just interested in this, we may just have the averages and percentages. In fact percentages in this case, but on an average and what are the averages, so the univariate analysis will be happening

But many times we are not satisfied only with this analysis, because we would like to know so many other things, how many men and woman or how many educated people or what type of the fashion doing, and then, their quality of life. So there may be many issues and we have to really analyze the situation. This things as to bi variate methods, and some of these examples which I was trying to give you will relate to bi variate, where to variables are related.

Two variables are actually analyzed, and where we are looking at the relationships and then the co relationship, coefficient as a method we can also use, and we can use simple technique like cross tabulation, we can also use that. So two variables are there and we are looking at the analysis of these two variables. But often in the management research and the social research, the things are, or the concepts are multi variate in nature, and so we use multi variate analysis such as.

Regression analysis which could be simple multiple regression analysis or step wise regression analysis, we use discriminate function analysis, where we are trying to understand, say two different organizations or two different states or say male or female, do they discriminate in terms or number of variables, so even discrimination not in the terms of one variable that we were discussing in the invariant by variate scenario, but here number of variables are there and there are two parasite growths.

So we try to see the how much is the maximum discrimination, we have another some other analysis, say we have drunken test, we have two key analysis, all these we use for finding out the discrimination of two or many groups in fact, it could be two group analysis or it could be multiple analysis also. We use our factorial analysis as a technique of multi variate method, where there are time to find out whether the number of variables, they are closely related to each other and then they do up their form of the particular factor.

Typically when we are doing any kind of index construction or development of the test of questioner, we are using factor analysis. Then in recent years we are also using structural modeling, we have been using pattern analysis in the earlier years and we use of costal co relation and the regression analysis, so using regression analysis and part analysis, that we have been using, we have now software's which are giving us a structural modeling. For example we have visceral.

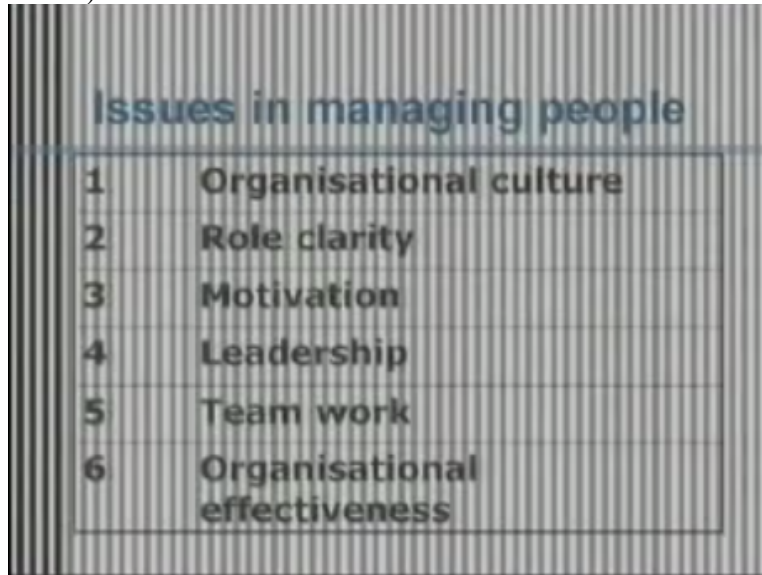
We have emirs, and these are the some of the software . Other analysis the quantities analysis, earlier we discussed, earlier we are doing that manually or we where using the calculators. But now since we have software's available, we have the computers available to as, so we are using number of software's , typically we are using SPS'S, which is statistical packages for social sciences, will all over the globe we are using.

In social science is a management research as well as the many other subjects, because the techniques are the same. So in addition to this, there are some many other software which have been developed. But simple percentages averages, this we can even do, or we can just prepare a spread sheet in excel and some of these are very simple ones we can also do there. But we can perhaps by using your PSS, for better results.

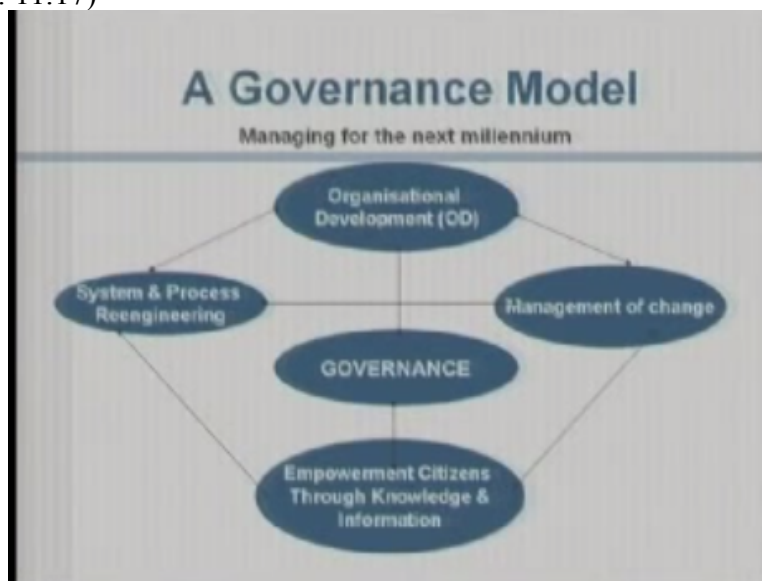
Actually we have been using, then there may be many other software's, but we are generally using this software for our research. So structural modeling gives us a dual analysis of the extension of the particular phenomenon and the analysis really has a great predictive value about the issue question, may be if you have not tried, you can look in to that. Say for example buying behavior, why people would like to buy a particular brand, and not the other brand because there may be number of issues it could be financial, or it could be individual person choice, or it could be social, it could be so many other issues are there.

So the technology related issues also could also be there, and public opinion issues can also be there, color choice also may be there. If you really wanting to analyze the buying behavior and it really make a good business in the automobile sector, is possible you collect the data using the best and buyers sampling design. And the best kind of the tools for data collection and have a multi variate analysis, and then repeat the desires.

Because in any science deprecation of the result are very important, and only when we deprecate the result number of times with the number of samples, we can really come to in real good decision making, and eventually we can say some kind of rising. So that as a great practical utility, as well as the tuditical utility. So from here we are trying to talk about,  
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Talk about some of the other issues, okay,  
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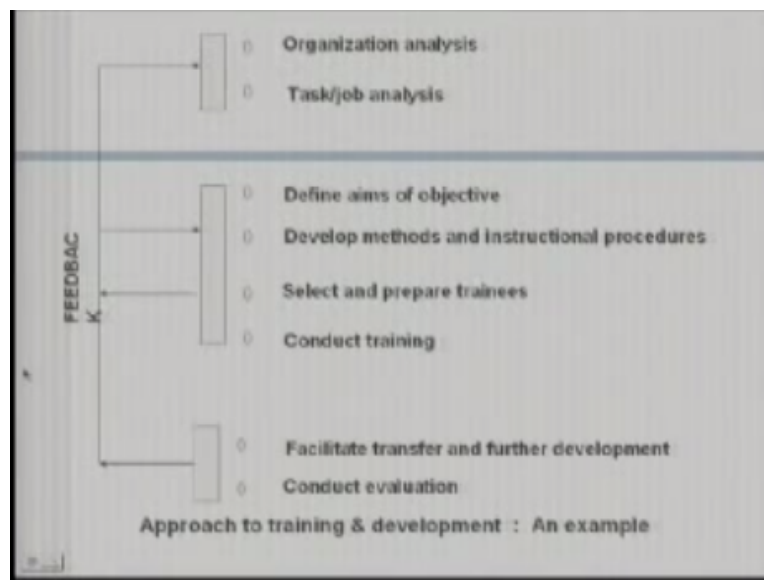


Let us now look at some of the other issues for example. The governance model that is used in the management research, and we are actually concerned about the governance in various areas. And here you can see, there is a governance model, you have the parameters, okay, various parameters of the governance issue, and we can collect the data on all bases in aspects, and make use of the earlier methods and the statically techniques, quantities methods we can use.

Sometimes we can use both quantitative as well as qualitative techniques. So we are taking about the governance model these days and one of the ways in of looking at the management research that we are doing in the current times.

Okay, do we move the form governance model, can you see that we have, or we have looking at the governance and the stage organization development is one we expected or the other aspects, and we collect the data on these, and then we finally arrive that what exactly is the governance, okay, so you have data on this, on this, and finally we have some kind of analysis plan you can decide by yourself, you can independently analysis all these, and then have malty variate analysis to arrive at accumulation. So here we move on to another example, here I have given you another example,

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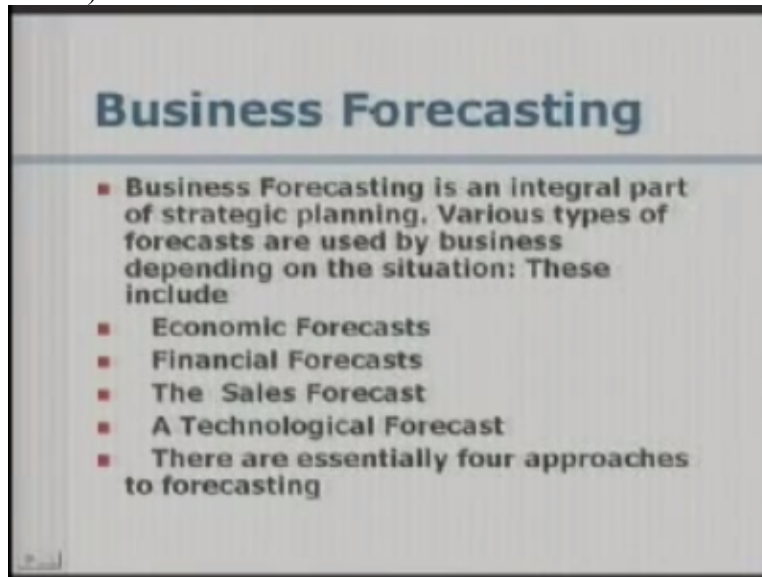
This is about the issues of training programs, now I am giving you some examples from the management research of how to make use of the some of these technique, so the governance model can be one another model could be, say the training research. So here training research program, we can approach the training and the development issue in this step wise manner. And at each step we can perhaps the training evaluation. Okay.

And finally we have the evaluation of the training at the end of the program this is the way we had given. And these are various steps of training, okay, and then at the end every steps you can look at that what happen, when they detraining a design was there in then how the people reacted things like that, then finally you have the evaluation of the training. We have discussed one of the types of research methods is the evaluation method.

And this also one of the objective of understanding the managementary research, so this gives us in a idea about the approach to, The design of training we have done, has that really given us in a any result, this particular training or yearly report I can prepare that we have conducted so many trainings, in each training this was the evaluation.

And we can design the evaluation process again in the terms of a taking feedback from the various participants. Okay, and then we have suppose, we had ten tending programs in a year,

and we can see that how much is the budget invested and how much it has daily made on impact on the attitudes of the people and the direct performance of the people. And how many people need for the training, for the counseling, or for the perhaps kind of input. So this is the way management research will help us designing the training and the development programs. From here we move on to another aspect business forecasting, (Refer Slide Time: 15:53)



In fact, I will be taking up the little bit time on this, and little more information on business forecasting, because this is becoming very important in the, again in the recent times, so the business forecasting is in integral part of the strategic planning, various types of forecast or useful for business depending upon the kind of situation that are trying to analyze. These include business forecast, financial forecast, sales, technological forecast, and as usually these four types, these types set up could be combined also.

This kind of forecast combined, and there are number of approaches to analyze these forecast. And these approaches we could understand as, (Refer Slide Time: 17:01)

## 1. Qualitative approach

**Forecasts based on judgment and opinion. These include**

- a. Expert opinions**
- b. Delphi technique**
- c. Sales force polling**
- d. Consumer surveys**
- e. Techniques for eliciting experts' opinions (PERT-derived)**

Qualitative approach, and now you can see the methods that we are discussed earlier in the cost, in the last lecture, we are talking about those in the terms in business forecasting. So the qualitative approach, this forecast is based on the judgment and opinion and these include the expert opinions, Delphi technique, sales force polling, consumer surveys, techniques for eliciting experts, opinion, which could be pert derived then,  
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## 2. Quantitative approach

**Forecasts based on historical data (time series analyses). These include:**

- **Native methods**
- **Moving averages**
- **Exponential smoothing**
- **Trend analysis**
- **Decomposition of time series**
- **Box- Jenkins**

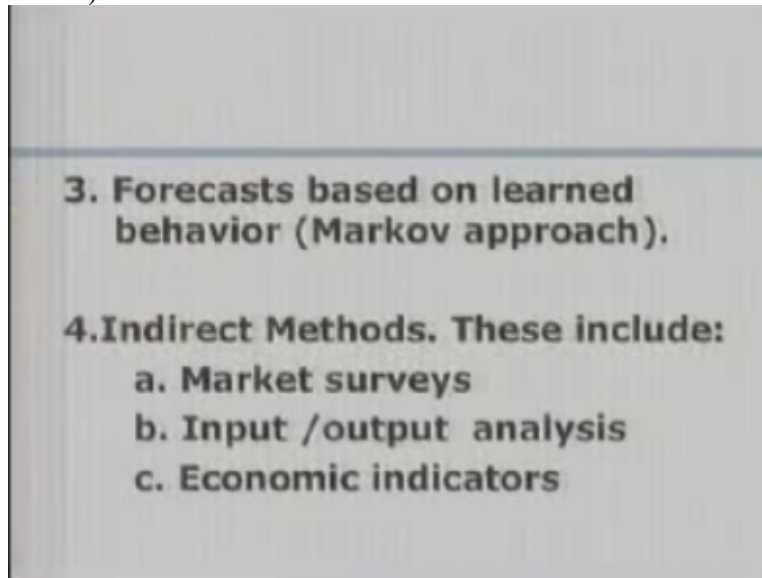
The quantitative approach we have, forecast based on historical data, which may be time series analyses, and which might include these. Did you understand the time series analyses? When is data is collected over in a certain periods, so ever six months or ever one month, or every two year something of that kind, because the social changes in inevitable thus going on all the time and even business are changing very fast, also sometimes they choices of the people are also changing very fast, that is why sometimes statistical analyses become extremely important for us to actually decide on these strategic decision.



As these include the native method of moving averages exponential smoothing trend analyses, decomposition of time series and the box-jenkins, these are some of the quantitative approaches that we are using for the forecasting's. Now we also had associative forecasts these includes, simple regression, multiple regression, economic indicators. We were talking about this methods earlier, and so you can see in forecasting also we making use of these methods including that qualitative and the quantitative techniques.

Now forecast based.

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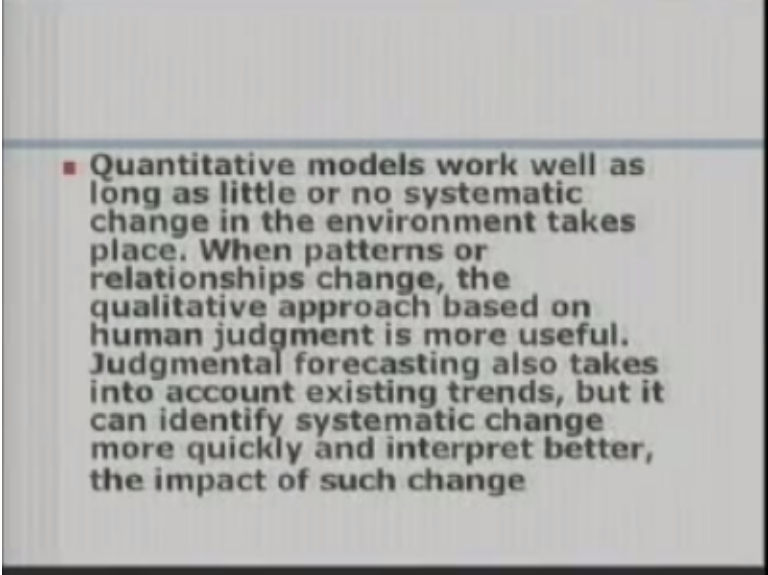


On the learn behavior, that is also an important way of forecasting, which relates to the Markov approach, and direct method includes market surveys, input/output analysis, economic indicators. So can you think about what we done in the last lecture, we were simply discussing what the research is all about, and how do we make analysis, and what are the different types of research methods, and here.

We talking about various tactic issue like the governance issue and we are talking about the forecasting issue or the business forecasting, because that terms are extremely important area in the business or planning future or deciding what to make and what not to make, how to do your advertising campaign, what should you do in this terms of an attracting more number of wires. So there are so many things which will relate to the whole issue of a business management in the decent of the aspect of technology in human behavior. So we move on to the quantitative models which,

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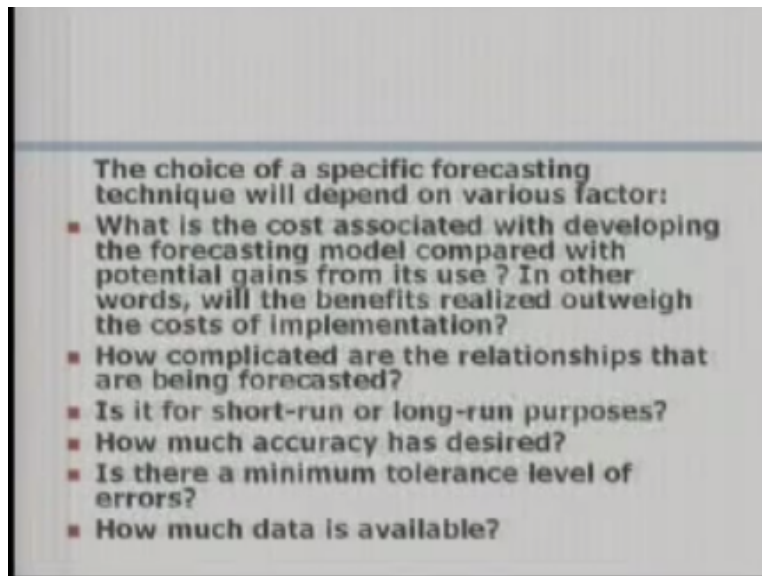
- 
- Quantitative models work well as long as little or no systematic change in the environment takes place. When patterns or relationships change, the qualitative approach based on human judgment is more useful. Judgmental forecasting also takes into account existing trends, but it can identify systematic change more quickly and interpret better, the impact of such change

Worked well as long as, little or no systematic change in the environment takes place, when pattern of the relationships change, the quantitative approach based on human judgment is more useful, and that is why the judgmental forecasting also takes place in the existing trends, but it can identify systematic changes, more quickly when interpret better the impact of such changes. What we are trying to say here is, that if you have an fixed parameters and also the fixed data, we can make use of the quantitative techniques, and say this point of time, this is what we found. But because of the changes in vitals.

I said just now, are the society moves and the other things move, so quantitative method has its advantages, yet we have to actually relate that to the judgmental or to the quantitative methods also. So in other words we can say that we have no choice, that only the quantitative or only the qualitative. If you really want to do a business management, you have to combine the both and you have to see which method will be the best one for optimizing the resources and the objectives of you management issue, what is in your hand on this point of time?

As I said number of fuses could be there, and it could be as serious as like the PHD research or it could be as quick as the day to day management things. Whatever be the case, we have to decide about the management strategy for doing the research on that point of time, basically scientific went to the mind is important for the managing things. This is what we are trying to say, whether a day to day managing is or PHD resource or what towards the decision we are doing, unless we have some data and some information, some analysis. Okay, we cannot really arrive at the very scientific pro decision.

And that is the objective we have been behind this we talked about this scientific query. So the choice of this specific forecast broad cast technique,  
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We will depend on the various factors, what is the cost associated with, this I said as furnishing resources, so in other disturbance again repeating that, what is the cost associated with the developing the forecasting method, compared with potential gains from its use. In other words, we will be looking at the benefits realized through the cost of the implementation, and then how complicated of their relationship, that are being forecasted? Is it for short run or long run purposes? How much accuracy has desired? Is there a minimum tolerance level of errors? How much data is available to us?

See the tolerance level when we are saying, when we are looking at the quantitative analysis, so we are looking at the level of significance, we can have 2% level, we can have 1% level, we can have 5% level, and we can have 10% level of significant. And typically, we won't like to go above 5% level, there idea here will be, if it is 5% level that we are fixed up for in a analyses 5% level of significant that means, we will say that, 95% are free of in any kind of wires or chance factor or the real differences.

Only 5% cases are because of some error wires of something of that kind. Okay, so typically we do not go beyond it percent, some subjects, or in some disciplines, it will differ from discipline to discipline from perhaps the issue what do you really want to do at? And how much you want you know that it should be of free judgment and the decision, but really more than 10%, but generally if I sometimes want to be very much particular percent for our analyses that I expert in 1% level. So, how much data is available, even that is concerned for our analyses, so from here I move on to discuss some issues like scenario planning,

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## Scenario Planning

- **A technique, which involves visualizing different ways in which the external environment may develop in the future and accordingly formulate strategies.**

Also this analyses, after this is forecasting that we have been done. Scenario planning is again a technique which is been used in our management research methods. And this is a technique which involves visualizing different ways in which the external environment may develop in the future and according formulate strategies. Okay, so we create a scenario on based on that, we try to visualize strategies. Once I was participating in one of the session of values in management, I cannot re collect which body was that, may be one of the bodies, here may be or one of those bodies, I cannot recollect it exactly which one was that.

So there we were looking at the scenario planning and also the participant were asked to give the scenario's about the development of a particular issue, so some people drew some scenario, some people wrote that inverse and some people did analyzes what they think. Then when you combine that in the form of you defined it on their scenario's origin. Okay, and then based on that you can further analyze a particular situation, any development or issues or any long term planning you could do that, in the management such these days we using scenario planning.

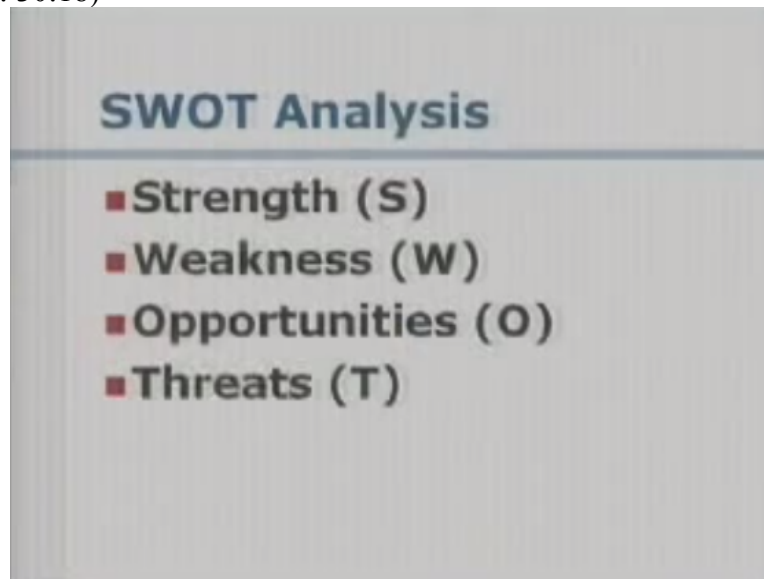
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- **It involves identifying social, economic, political or technological developments that might have significant implications for the firm. Accordingly, pictures of possible outcomes are developed. Royal Dutch/ Shell is considered to be a master of scenario planning.**

It involves identifying social, economic, political or technological developments that might have significant implications for the firm, for the firm, for the state, for the organization, here we have written firm, but does not mean it is limited only to a particular firm, it could be limited to even a society, or a particular state, particular issue of development, or the issue of values, okay so do not take it just like it is only limited to that, accordingly, the pictures of possible outcomes are developed, and then we have given you this example.

The Royal Dutch/Shell this is considered to be the master of scenario planning, one of the books, I found you know, on this reference, so I thought that I will share that with my students, okay so many companies have been making use of this scenario planning, from here, we move onto the SWOT analysis.

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I am sure many of you have heard about this, SWOT analysis has 4 components, Strength, Weakness, Opportunities and Threats, whenever you want to make any decision, perhaps this would be a very good method to make decisions, you can list the strengths on this situation, or your decision, weaknesses, opportunities or threats, these could be one, these could be 9,10, 50 we do not know, because ,that is your analysis, so a group might sit and everyone, tries to list that if we are doing this, this kind of expansion plan company.

Then what happens, what will be the strength, weakness, opportunities and growth, and everyone discusses, and everyone give their ideas about it, okay, and then we analyze, so before I go further, let us see SWOT analysis.

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- **SWOT analysis is used for identifying those areas where organization needs to pay special attention**
- **Helps a company to find answers to various questions.**

The SWOT analysis, is used for identifying, those areas where organization, needs to pay special attention, to certain things, as I said in the extension plan, perhaps ,into my mind as an example, this helps a company to find answers to various questions.  
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### **Ethics in business research**

- **Invasion of privacy**
- **Deception**
- **Already existing negative effects**
- **Hidden objective of sponsored research**

And the analysis, then well, I will move onto this, just in a short while from now, so the SWOT analysis, I can analyze any special situation, I can ask all of you to write about your perception of values, strength, opportunities and threats, because in every situation there may be certain + ve aspects and there could be, at least , you know, in your mind, there could be certain -ve consequences, so when we analyze these, and also.

I could do that for my own decision making.

And also we can do for an organizational decision making, I can make a composite index of all these SWOT analysis, and analysis that I might get, and then arrive at some kind of a formula, saying that in my company, this is what I am going to do, growth or the expansion program, okay

but for individual decision making also, we are also making use of SWOT analysis, very common.

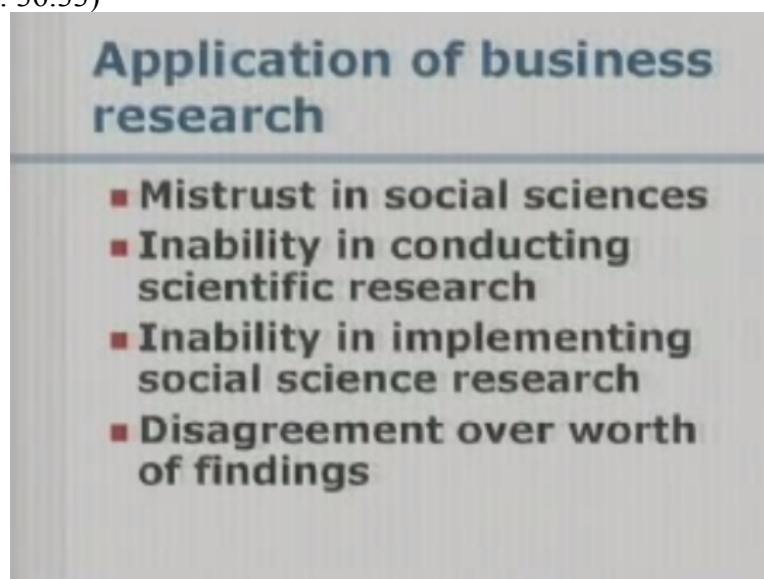
If I want to see a particular education institution is doing well, I can do SWOT analysis, I can interview all the decision makers, say of my institute. And look at the strength, weakness, opportunities, and growth from each one of them, and then compile results ,and prepare a report, okay, so this helps us in , the further planning again, and analysis of what are the state of affairs, currently in a particular organization, right so from these methods , which I have discussed, so far, we now move onto certain issues , which I have shown you, the ethics, any research that we are doing, the ethical issues are important, and let us now move onto the ethics in business research.

Since in business research, you will find, it will involve people, involve society, involve organizations, okay at least large number of that , we have to look at some of the ethical issues, very closely, sometimes, people might say, why are you asking me so many questions, it is invasion of privacy, sometimes, they will say that you ask me this question, but this was the issue of deception, because you tried to sort of ask the question in such away, that I got confused.

And, I am in a kind of deception, so people might say that, already existing negative consequences may be there, about certain things, and again you know we are trying to look at that particular aspect, for example, I am a pharmaceutical company, and I know certain things have negative effects , but my marketing is suffering, so sometimes I do not give the correct information, sometimes.

I am giving some, medicines and not saying that will result into, this or that, okay, so already existing negative effects are there. But I may still want to do something, some research, so this is analytical, so we have to make the user, the person, aware of all these, only then, we can do this research, then the hidden objectives, sometimes there may be a sponsor research, and the sponsor research, might say something that we wish to help in development, but there may be a kind of an hidden objective, which must be made very clear, now the application.

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So far in my journey, to design management research, then how to design the objectives, methods, various management issues, and also after we have done that, we have also to be very ethical, when we design management research, and now we come to certain applications, and what are the difficulties, why sometimes, people do not believe some of your research, the reasons could be that, there may be mistrust.

In social sciences, see as we have seen in the last part of management research, relates to people, society, organizations, interpersonal sort of a relationship, and the business, marketing, okay, so sometimes there may be difficult,. Because people might have mistrust, many times people believe that social sciences are not really , valid in their approach, if I just say so, we have to make it a very scientific, in terms of its approach, and so that the creditability, of the management research that you are doing, is not stake, so you have to be very meticulous in designing your study, then inability in conducting scientific research, you need training, in conducting scientific research, otherwise ,many people sitting on the arm chair, they will be believing that, i am an expert in conducting scientific research.

So whatever, I say, is the final thing, not the management research, is a real, and vast subject, one can, and needs training, one needs the real, scientific temper, to conduct any kind of research, why management research, any kind of a research, and so that is also true about management research, and then the inability in implementing social science research, because again social science.

I am using, interchangeability with management research, because of the reason that the, largely subject matter comes in, under this larger paradigm. Then flowing from you know earlier, these issues, disagreement that you might have in about the worth of these findings, disagreements, could be again you know start believing that, there is some kind of a mistrust or the scientific power is not there, and this kind of a situation could be there, so we have to be extremely careful in designing, the management researchers, so when we have collected the data, we have to interpret that ,going in for a scientific enquiry ,and sometimes we find, that, our interpretation problems are there.

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## **Principles of interpretation of business research data**

- Interpretation of data is the final stage of a research study i.e. drawing proper inferences & conclusions
- We must remember that statistics are means to an end & not an end itself
- Therefore, there is need to do careful interpretation of results to avoid danger of wrong conclusions
- We should ensure that data is homogenous & comparable

So first I will quickly, discuss with you the principles of interpretation, of business research data ,and then we move onto some other aspects, so the interpretation of data ,is the final stage, in a research study ,and that means drawing proper inferences and conclusions, so we must remember, that is the statistics , we have really drawn, is it an end or is that a means to arrive at certain conclusions, sometimes, we start believing that , that is the significant level, that is nothing, but that is if you are interpreting that data, you have to look at your management system.

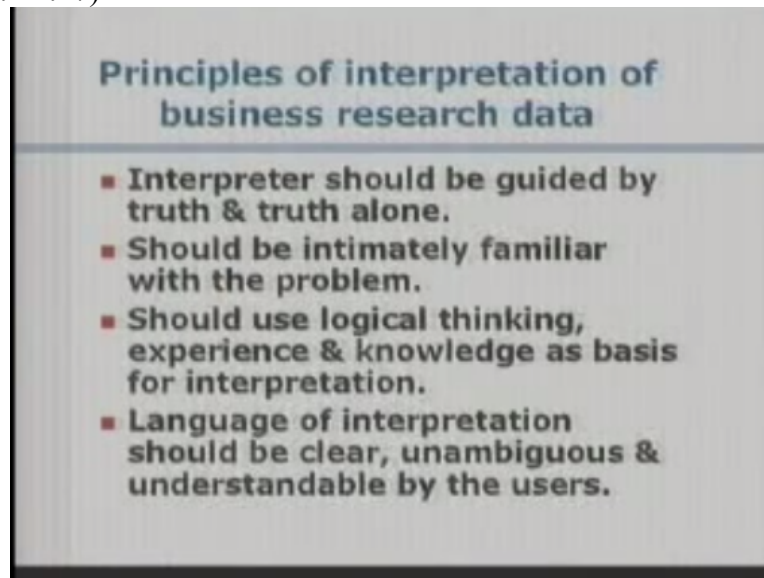
So your social system, and then try to interpret that data, okay so that is important, therefore there is no need to depend on 100% of that, you have to do interpretation and there is need to be very careful in interpretation of results, to avoid any danger of wrong conclusions, okay then we should assure that the data is homogenous and comparable.

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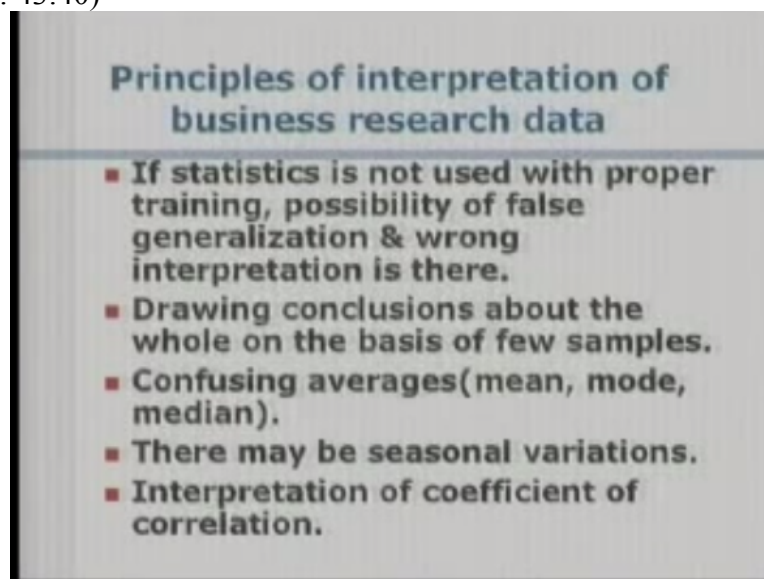
## **Principles of interpretation of business research data**

- Data should be adequate & reliable
- Data should be related to the problem of research
- Data should be collected through a bias free method & should be scientifically analyzed

And so the data should be adequate, reliable, related to the problem of research, collected through a bias free method that means the sampling free design that we have discussed and the scientifically analyzed interpretation should be guided by truth and the truth.  
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Alone should be interpreted should be familiar with the problem remember one who is conducting the research should be intimately with that problem, and should have a logical thinking experiences & knowledge because these are important as basics for interpretations then the language of interpretations should be clear, and unambiguous & understandable by the user in fact these are also the piece of communications 'when you are trying to give you know the scientific communication to sound one these are principles which we have to use.  
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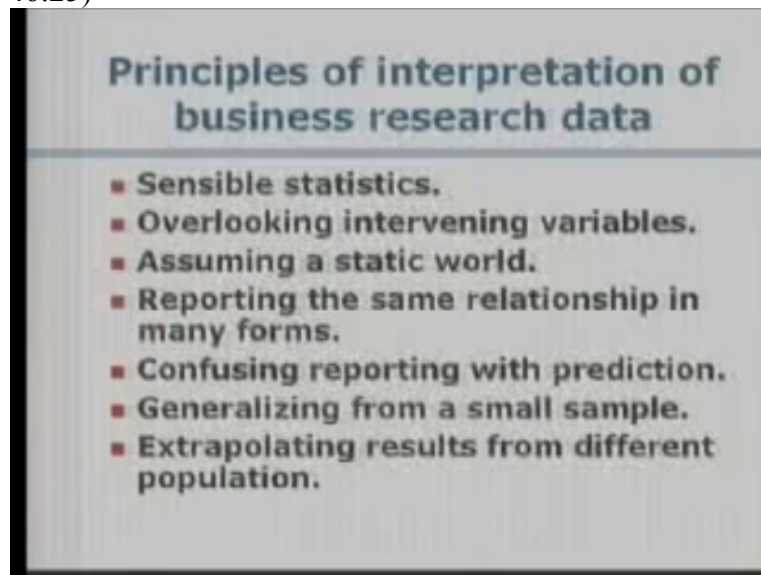
If statistic is not use with proper training, possibility of proper generalization may be there, these may be there may be wrong interpretation then drawing conclusions about whole on the basic of few samples sometimes we will just take ten or fifteen samples and then we will try to generalize

that is done in many times in management research so we have to see that generalizations may not be possible you could talk about the few case studies but if you want to generalize that, then you need a larger study for that then confusing averages mean, median and mode are the three measures of central tendency.

I am sure that all of you know that and many times disaster might use mean, mode and median ask the same indication or interpretation. Do you know what the median is and do you understand that? Median is the fiftieth percentage .percentage you understand that well may be when you do you are detailed course on a management research methods you will be discussing many of these manual details but for now remember that mean, median, and mode are the three measure of central tendency.

But these are giving us the different we can say different interpretations it has to have a different interpretations different values are there okay then there may be seasonal variations okay, say for example when you want to market something before diwali are you are trying to market something in hot summer okay, in you are research design itself you have to built in some of these parameters then interpretations of coefficient of correlation.

That again people might think you know what should with the value what should be the significant you have to understand the samples size and all these so, the interpretation of correlation coefficient itself you know some times might lead into wrong interpretations (Refer Slide Time: 46:25)



As so, sensible statistics may be need it and sometimes we over look the intervening variables we assume the world as static world we have discussed that in many other contexts that the world is a dynamic world ever changing, it changing every day and if you assume world as static world you are interpretation also get defected and sometimes we report the same relationship in many forms in a table in a graphical interpretations or may be became the combine table so might in also make some difficult then confusing, reporting with predictions.

Predictions when we are trying to predict certain things and reporting is just we are trying report certain relationships and also generalizing from a small sample and extrapolating results from

different populations you understand the meaning of the extrapolations you have results from different populations and you are trying to extrapolate that for a situation so, this is actually a difficulty and these are the shortcomings in the interpretations of results.

Because then if you decide in the basics of this there may be difficulty also some of the other issues are that hypothesis of your study may be incorrectly stated.

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**If theoretical propositions are not supported then:**

- Hypothesis may be incorrectly stated
- One or more assumptions underlying hypothesis are incorrect
- There are sampling errors
- An inappropriate test/measure has been used
- There may be simple data processing errors

One or more of the hypothesis may be incorrect there may be sampling errors, there may be inappropriate use of tests, there may be simple data processing errors.

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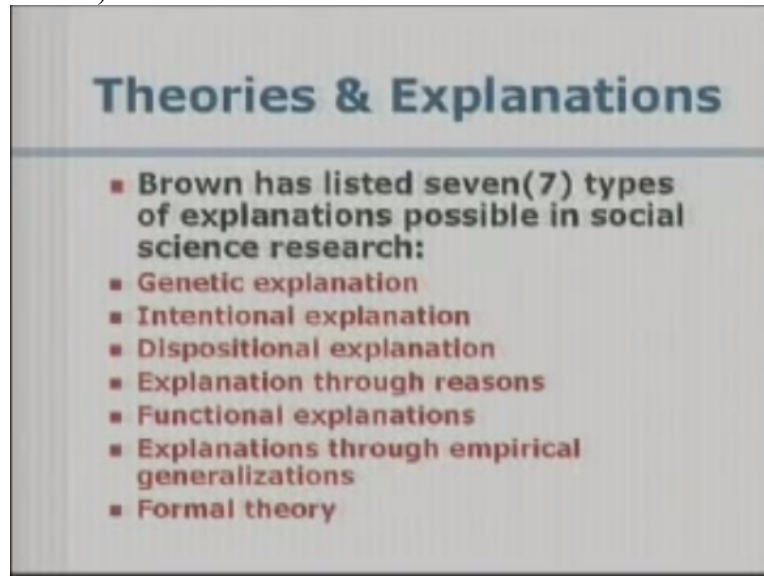
**Theories & Explanations**

- A theory may be viewed as a thought process, way of thinking about reality (but not reality itself)
- Criteria of a good theory are:
  - Testability
  - Clarity
  - Precision
  - Simplicity
  - Parsimonious

And so, there are, is it clear that interpretations are important and there will be many situations where because of long interpretations they report that, they have made that actually not worth depending upon okay, now the theories are seen whenever we begin with any research theory we have some theories some assumptions some concepts are based on that we decided about objective and decided able studies.

And when we look at the theory the theory may be viewed as a thought process that the way of thinking about the reality in a very simple terms are the good theory is the one that has testability, clarity, precisions and parsimonious.

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And there are number of explains which are there in fact in social research and here these are explanations of social research I am trying to discuss us the explanations of a management research to because the us part of management research is a social research as we have discussed and brow has listed seven types of explanations in social research these are genetic explanations, international explanations, dispositional explanation, explanation through reasons, functional explanations, explanations through empirical generalizations, and formal theory. In fact each one of these need in a discussion in fact this slide itself it might need one full hour of discussion so, may be some other time if we need we will be discussing these for now only this much is in half for this part because I will be just closing a few other things. So, let me now move on to the report writing, reporting writing is the final commutations of result for business utilizations and excellence.

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## Report writing

- **Communicating results for business utilization and excellence.**

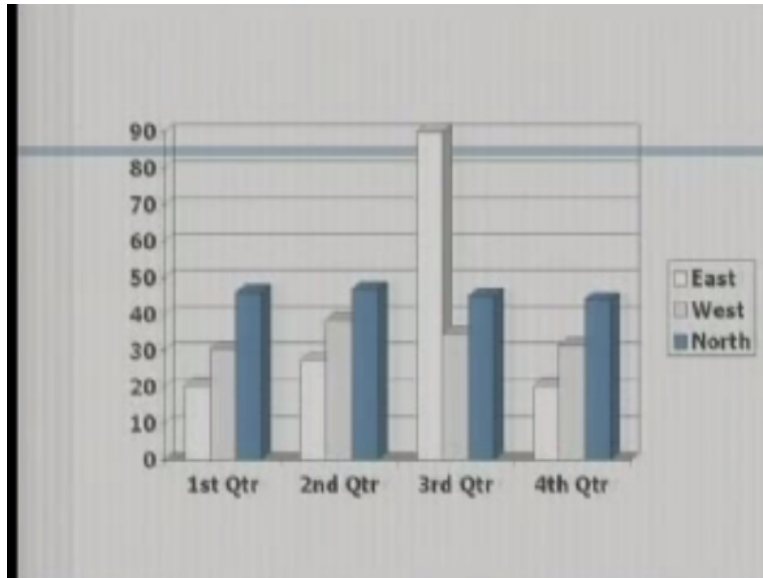
After we have conducted our study and we have to prepare the report the first considerations in reporting writing is that who is the audience for this report in other words the research was conducted for whom is it a PSD research and tech research is it a market research, is it for decision making, is it for day today analysis of a particular firm, is it for policy planning, is it for evaluations what is the objective of this research that I am doing.

And so, who are the audiences is it a government agencies is it my PSD examiner, is it my client, so based on that considerations the report has to be return this is the first aspect that you have remember and based on that you will design you are study whether it has to have a formal character or semi formal character so are sometimes a general newspaper kind of it and character okay so, that you will decide because we have so many good researches also appearing in the magazines and in the newspapers.

So the way we are trying to communicate there this research has have a totally different way of report writing were as when you are writing a PSD theories it is a formal and very formal type of report writing okay so, this point we have to keep in mind and in this we have to also see the principles communications.

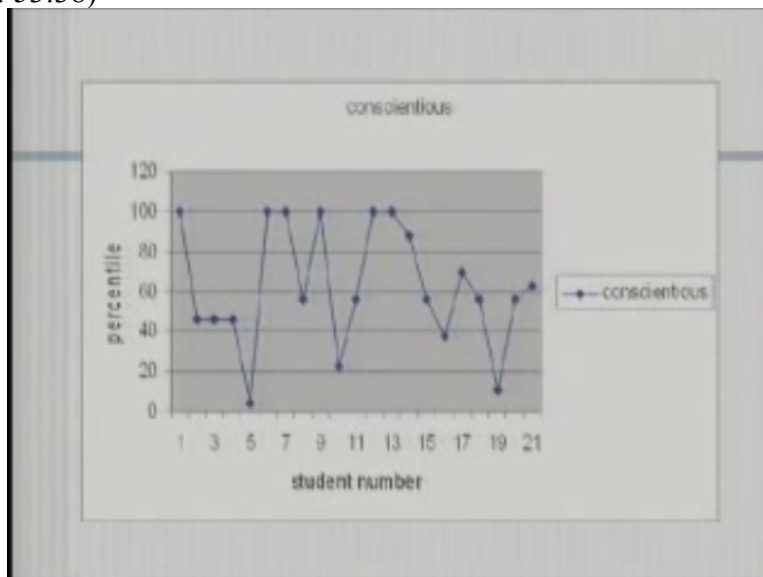
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Communications in terms of the languages for example I have already talk about the language aspect earlier that we can use the language but never use ambiguous language there is no need of using very extremely flowery language you could be straight away talk about a very simple language only then the communications gets across to every recipient every one can understand if you are using very simple language.

Now when we are also righting a report and making it as a formal character then the graphical representations became extremely important these could be of many types say from bar chart.  
(Refer Slide Time: 53:38)



As I am showing the bar chart to you to the frequency falling in we can have the frequency falling in we can also have other methods  
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for example we can have pie charts in additions to this we can have the line diagrams we can also have these skater diagrams I am sure some of you have eared about it and so, on so that the report really becomes self explanatory sometimes and very scientific  
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## ■ Implications for utilization of research & policy making

So, from here the report writing we move on to the last point in lecture which in fact conclusion of two lectures or the management research method about implications for utilization of social research this is and for policy making so, in fact in every research as I said is for decision making for policy making for any kind of a future forecasting any kind of a designing of a particular system and so on.

So when we are looking at the implications we have the implication those in terms of a behavior, control and predications policy making utilizations decision making are the report writing of course will be related to this particular to aspect as so remember that utilizations of policy

making if you look at the models the models could be sometimes just the research done as enlighten model.

Sometimes it could be done as a problem solving model, sometimes it could be done as a quick decision making model, sometimes it could be done as a some sort of formal knowledge generations model just for generation of knowledge okay there could be many models for research utilizations and what model we are using again depends on our objective of the researches so we move on from here to understand various aspects of the management concepts and we move on to various chapters management.

I hope you have being able to understand the tow will you conduct management research there are very many areas of management researches and which you will be able to use in you are studies okay are there any questions? On the management research there are many references on this well work I was teaching you this is of course a combinations of many sources and some of those are given in the list of references which I am going to give you at the end of the whole course you will find list of references about whole courses itself so you will find many things and the software are available.

You can buy the software's and in that you know there are manuals you can make use that but then these is really very much involves subjects and if you really wanting to make use of management research method then you have to very carefully look into all aspects of management of design of a research so, I close with this okay.

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