Human Resource Management – I

Prof. Kalyan Chakravarti

Department of Basic Courses

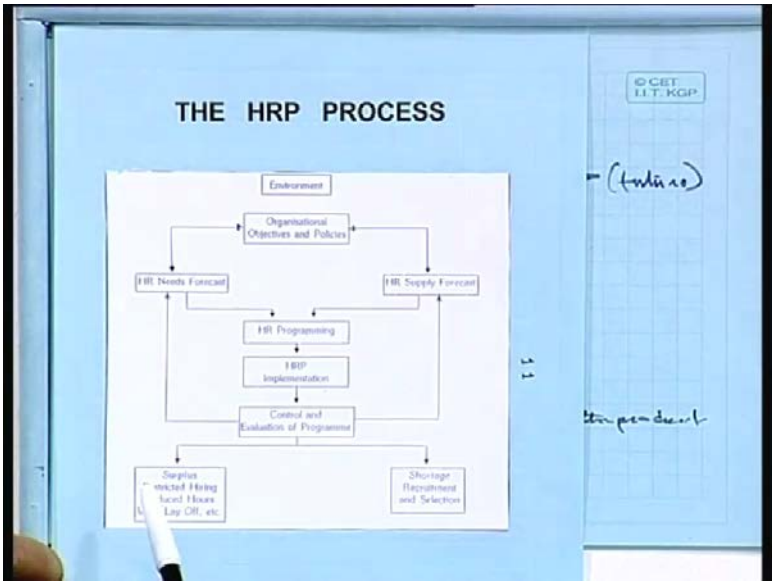
Indian Institute of Technology, Kharagpur

Lecture No. # 5

Human Resource Planning - II

Good morning again, now we continue in this session on the topic of HRP - Human Resource Planning (No audio from 01:13 to 01:32).

(Refer Slide Time: 01:25)



So, here you have a flow chart, you may not be able to see this very clearly, so I will spell it out for you. You have the environment here, because every organization is within a certain environment, so this is the environment. And these are the organizational objectives and policies, because this is a top management policy which is in relation to the organizational objectives to fulfill those objectives, the policies that are made.

This is the HR needs forecast, who forecast the needs? The operating departments will forecast the needs. And then it will be collated and consolidated by the HR department. And this is a HR supply forecast, so who does the supply forecast? The HR department; they are the people who can forecast how much supply is there.

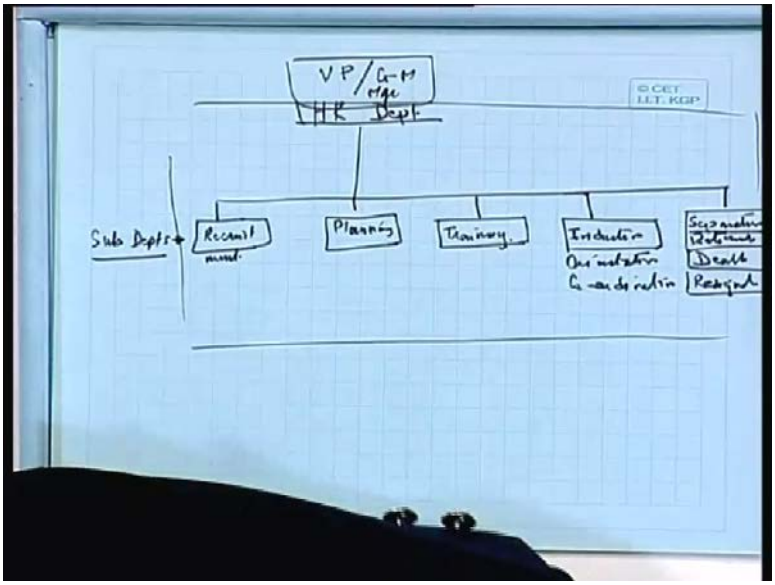
Then this is HR programming, HR implementation programming is what making basic plans on how to balance the needs with the supply, then the implementation. So the implementation will be of two types, one is acquiring, that is advertising, the recruitment process, short listing, then the selection process calling them for interviews, interviewing and then appointing. So that is the acquiring part, and the other part people are separating also right, so the separating part also has to be done.

So, when you have a need you have to have a net need, because some extra people will be required, some people will be leaving. So, what is the net need that has to be established, and implemented. Then control and evaluation of program, then you find out that what was your plan and how well did you succeed in implementing the plan, that is after every implementation; you should have a self monitoring and see how you did.

And then, control and evaluation after that you have the surplus restricted hiring reduced hours VRS layoff, or shortage recruitment and selection. If you have been able to do your work perfectly well, there will be complete balance right. You will have neither shortage nor any need to recruit.

So, this is the conceptual representation of the HRP process; any question on this? Within the HR department, there will be number of sub departments, which will be doing this exercise total exercise.

(Refer Slide Time: 05:01)

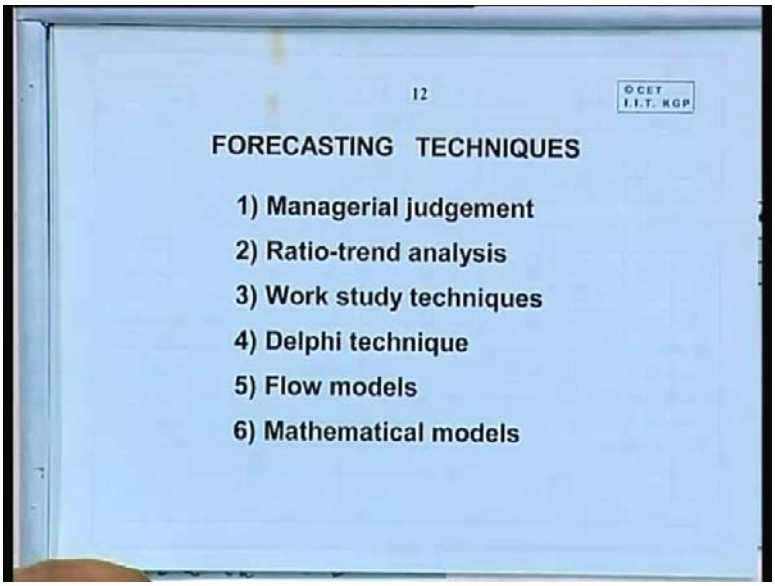


So, (No audio from 04:45 to 04:58) you have the HR department, and you will have some sub departments. So, these sub unites, or sub departments, one will be recruitment, the other will be planning, next the third will be training, fourth will be induction orientation, when new employees come, and coordination which you in different departments. Next will be, let us say separations, those who retire all right, those who are deceased, or those who resign.

Separations that is retirement, if people retire they are given benefits right, so planning those benefits; if people die again benefits are given. Similarly, those who resign all the processing on the administration of the registration, so retirement, death, resignation.

So, all these sub unites must work in coordination with each other to make the HR process, which we just saw (Refer Slide Time: 07:32). So, this conceptual model can be translated into this working organization chart, of what happens and depending on the size of the company. In the HR department, you may have a vice president in charge V P, or you may have a G M H R, or a manager, depending on how big the organization is.

(Refer Slide Time: 07:58)



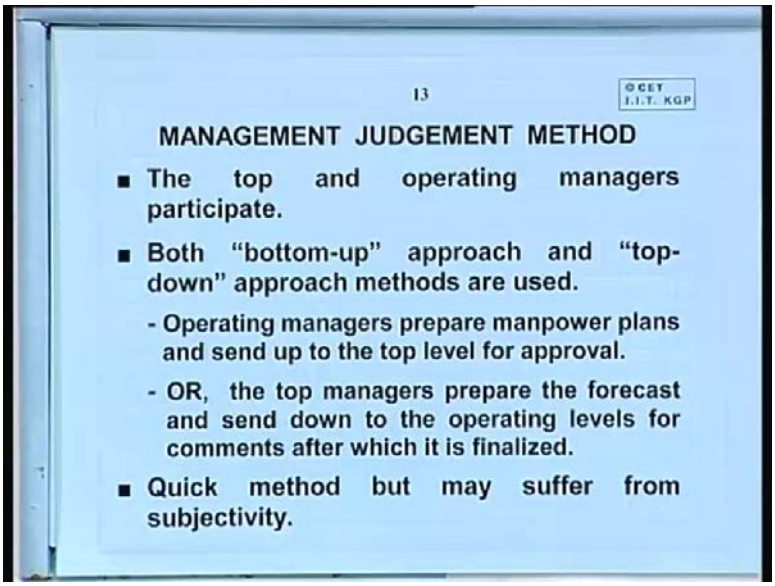
Now, we come to what we call forecasting techniques, because as we said planning is trying to estimate, how many will require. So, there are some types of techniques one is managerial judgment, that is by experience you can know all right, from the past trend and the future businesses, the emerging trends by experience and judgment, you make a forecast.

Then ratio-trend analysis, we talked about this a little in the last session, about if the sales all right is hundred, and you want to increase the sales to one twenty all right. And you had 20 people, so to increase the sales to 20 percent, how many people you will require? So that is basically ratio-trend analysis. Then work study techniques, Delphi techniques, flow models and mathematical models.

So, these are the various techniques, which are available and which we have to choose depending on our company, type of business we are, type of accuracy and sophistication that you want to achieve. But, remember each of these techniques all right, is only finally giving you a forecast; a forecast is not a guarantee of what is going to happen, is it not? It remains an estimate.

Only thing is if you use a refine model, you may go from a guesstimate to an estimate. What is guesstimate? Less accurate may be more guess work, and estimate is based on some decision support system, some data, and some information. So the forecasting may be a little better, we will come to that one by one.

(Refer Slide Time: 10:14)



You guess something, you know all of us we when ask the question, we try to find some logic in our mind. And usually that logic is found from experience, when you do not have any data; past experience that gives you the logic, is it not, so and when you guess without any other supporting data, sometime we call it a guesstimate. That is an estimate made on the basis of a guess, which again comes from your experience, past data that is

guesstimate. And estimate usually is something which is not only on a guess but, it is based on some past facts, which may be there some hard facts, some scientific approach, or method and then we arrive at an estimate.

So, managerial judgment method, the top and operating managers participate, that is not only the top managers, but the operating managers. Both bottom-up approach and top-down approach methods are used, what does it mean? What is bottom-up approach and what is top-down? It means exactly what it says. Operating managers are at the bottom, top managers are at the top. So, the process may start by operating managers, preparing manpower plans, and sending up to the top level for approval.

And this is the normal process, in normal times this is the normal process; in unusual times, the other process is there that is top people simply give a directive. Directive may be no additional manpower to be taken next year, manpower freeze but, in normal operating times you have that bottom-up approach.

So or the other way top managers prepare the forecast and send down to the operating level for comments, after which it is finalized. Any question on this? Anyone who has any work experience here, no one of you, none of you? Once you are all in educational institutions? Defense, production.

(( ))

So, construction and maintenance, now you have participated in some process of planning, manpower for your department.

Yes sir.

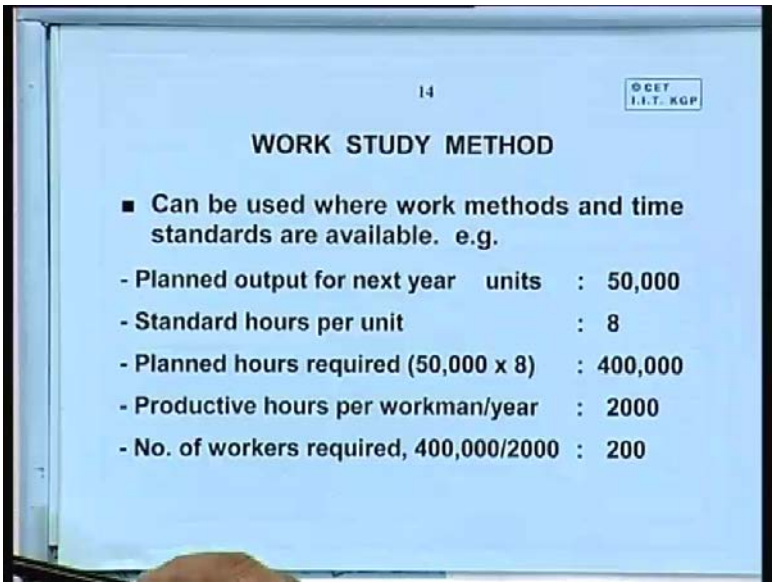
What is that you have seen in (( )) is it bottom-up approach? they ask you how many manpower will be required, or top-down, they are told and then you plan your requirement send it up and then you will get a approval, or approval with some reduction or whatever it is. Quick method but, may suffer from subjectivity all right, so why is his saying quick method but, may suffer from subjectivity.

Because, hard facts are not there basically by judgment, what method you used? You did this judgment method in MAS? Depending on what method? Depending on number of construction you will have. So you require supervisors if there number of sites are

increasing, yeah if there is a number of sites which increase, and you cannot cope with the existing supervisors. Otherwise the supervision quality will not be good, and then you may ask for new diploma engineer or other supervisor.

So, that is not only guesstimate, it is based on some facts which you know about the future also may be someone is going to retire, that aspect you have to take into account. So, that is the kind of approach which happens in real life, in military engineering services.

(Refer Slide Time: 15:00)



Next is work study method, all of us are familiar with work study method, this can be used, where time standards are available. And we all know what time standards, anyone does not know what are time standards? All know. So, what are the time standards? You do not know, you said all know, if you do not know you ask then. Otherwise how will you learn? You know time standards? You do not know right, you have to establish the time, that is how you measure productivity.

So, any job if it is a machining component, let us say on a machine, then the industrial engineer or the work study engineer will come with a stop watch. And he will observe for 1 whole shift, or 2 shifts, 3 shifts, 3, 4, 5 workman, who is doing the job. so the job may be involving picking up the raw material, all right putting it during the press operation, putting it on the all right, after that actuating the press comes some cut outs

are made. Pick up the work piece, finished piece, stake it on to the bin, then again you do the repetition, after some time you may take a brush and clean.

So, there is a process sheet led down all of you have had workshop you know, you are mechanical engineers, you have seen machines, you have been in workshop operator, machines, and then you should know this you are not. But, how would you do it in industry, you have taken industry training in your B tech or BE level, no; then you know how what happens in the shop floor.

Otherwise, how do you know how many pieces the work is worker is supposed to produce, so work study started many years ago at the turn of the last century. So scientific school of management, this is the scientific school. Trying to apply scientific methods of studying the work, time taken, and something which is connected with this is method, how that work is being done, is it done by the most efficient method or not.

So, work study is time and motion study, we also used to call it, and then you keep on measuring and see, and try to find out what time you should take 5 seconds, 8 seconds, 10 seconds, and then you put factors on it. To say after all the workmen cannot be there for 2 hours on the machine, he has to go to the toilet, there is a fatigue factor, and he takes a little brake.

So, adding all that, they say all right, the standard we are saying now, establish scientifically by actual measurement, giving all allowances is every shift. Let us say this piece, you should have 1000 pieces, that is the time standards. So, that is what he is saying, where time, where work methods, and time standards are available, if not available, how do you know, is guesstimate again. When a standard is there, then on the work sheet, whenever something is processed on the machine, you must have seen in industry, there is a job card which comes along with it, is it not. How many pieces have to be manufactured, what machine, what tool, what material to be drawn from the stores.

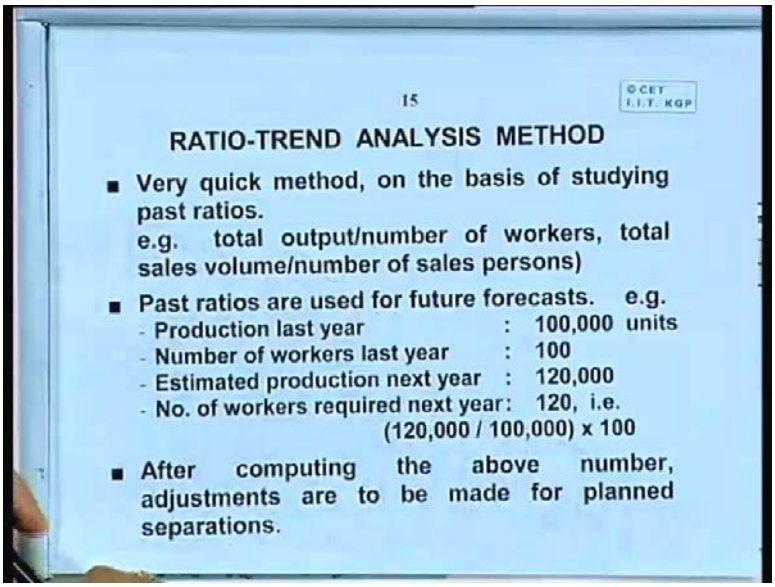
So, then you know when you are estimating for manpower all right, you see planned output for next year, like this side here 1000 pieces per shift. And this of course, we talked about component but, it has to be exploded into how many components will require each work station where you are processing it all right.

So, what you are going to get forecast is for the finished goods, is it not, not for a component. Then the panning process, we will have to see that for ex finish good there may be two hundred components, in there some of these components are made in our factory, some are brought out from venders, where brought out from venders, we do not have to increase our manpower, where is made we have to increase the man power. So, you come down to the level where you estimate saying planned output for next year is 50000.

Let us say standard hours which you know, because it has to be there, per unit is 8 hours, planned hours required is 50000 multiplied by 8, productive hours per workmen per year, what does that mean, you take the holidays; there are 365 days in the year, count all the Sundays, or weekly off national holidays. Then you also estimate for the average leave that is eligible, say they have got 8 days of casual leave, and you see historically that every workman takes full 8 days every year. So minus 8 days finally, you come to productive, so many workmen hours 2000 per hour.

And number of workers therefore, required is 400,000 divided by 2000 is 200. So this is the work study method, it is just a little scientific method, and this is only possible where the time standards is available. And if time standards is not available, then you have to either guess a time standard, estimate a time standard, or look at the past, and from the past you do ratio analysis, that is the next method.

(Refer Slide Time: 20:53)



Let me ask you where, who took training in which factory, anyone took any training in any factory, which factory? Rourkela steel plant and which department? Fertilizer and chemical. So, basically pipes and tubes and dials and meters, is it not. So, there the workmen do not do any production work, what do they do? Observation of all the parameters, temperatures, pressure, but the process is done by not the workmen, chemical is going process parameters are set and they are controlled.

Any one read in

Yes

National ball bearing company, where? Jaipur and what was the process, ball bearings but, is it one automated plant right.

So, what were the elements of work there in the tape or division, how many workmen did you have?

Around 20.

20, so they were feeding something into a machine?

Yes sir,

Did they have time standards?

Not sure.

Well industry training is not suppose to make you an expert but, gives you a feel and flavor of what happens. Because, industry you have to control productivity, you have to control the material you have, to control the cost, otherwise you will end up making a loss, is different from our laboratory is it not. Laboratory you can waste some material, also main purpose is to learn and what you can do is a laboratory, sometime you cannot do in industry, that is why you heard of scaling up.

You do at laboratory stage, pilot plant stage, but you sometime unless you scale up and see, you do not know whether it is possible, to with a manufacturing stage, simple example is cooking, I always give this example. You cook in a house for 4 people, and

you cook for 400 people in the hall, do you see how the methods are, you have such a big bowl, that you require a strong man, with a huge thing to stir it round also.

So, the parameters which you control all right can be very rough and not very exact as you do in a house in a small scale. So it is very difficult to get very tasty food in a mess as you will get in your own house, unless you mechanize it now that is what, so this is a kind of thing which you see. Now estimating by ratio method, is a very quick method and base of studying past ratios, if you do not have work study norms, then you can use this by past.

But, please remember that past is no guarantee into the future, because things may change, but, in the absence of anything else, we as managers we have to take some decision all right. Because we do not have data, we cannot say we cannot decide, so we have to take by recourse of this method.

So example, total output per number of workers, total these are the parameters I am saying; remember we discussed in the last session some ratio, one may be numerator is output. Output means what? Production number of units, or even in rupees but, here it means number of units. Denominator, number of workers or it may be another ratio, total sales volume. Let us say in rupees, by number of salespersons which we said, then past ratios are used for future forecast.

So, it is production last year, is 100,000 units, and number of workers last year is 100, then estimated production next year, if you get a forecast from production department is 120,000 units. Then number of workers require is 120, This 120,000 divided by 100,000 in percentage all right, multiplied by 100, 100000 upon 120,000 200,000 upon 100,000 multiplied by 100.

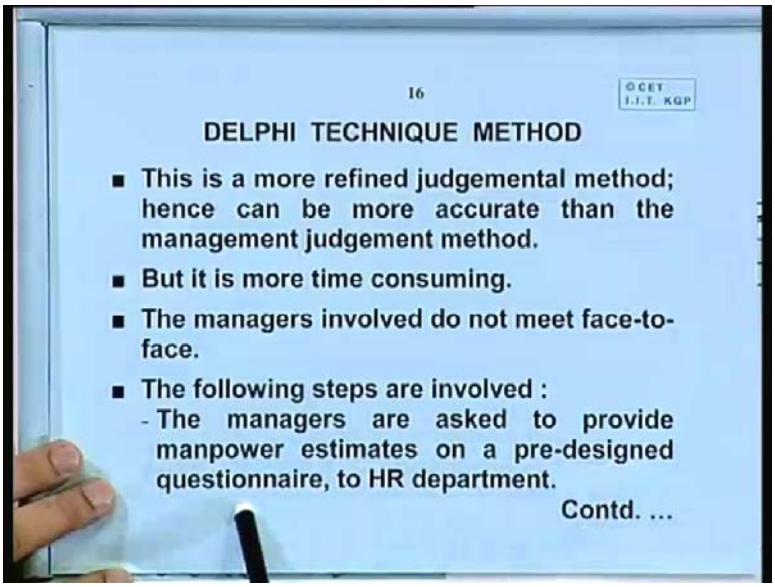
So, 120 after computing the above number adjustments are to be made, this is important, adjustment made for planned separations. Separation also means promotion mind you, it is not as if they are leaving the company, some people who are workmen let us say highly skilled, they are promoted to supervisor, that means they become indirect. All managers are indirect, by the way they are equally important but, they are not direct they are not on the machine.

So, all managers to an accountant, all managers are over heads, did you know that, over head we think something which is unproductive, you know over heads. So, managers are over head, because their costs are indirect cost, they are not direct cost. So, their costs are allocated, say your the general manager production and in your office your pays and your secretary's pay, and all the other cost of the office is 10,00,000 a year. And you have ten departments in your factory all right, may be 1,00,000 will be apportion as a cost of each of these departments.

That means, whatever is their cost plus 1,00,000, that is they have to earn, recover your cost, also because they are direct by producing that amount also. So you see management you have to stay very lean, you should not increase the head office cost too much or your own, by having a big cabin, three assistance in your office, because you are overhead always good companies they try to have more direct and less indirect. Questions, any questions? But, the dichotomy is who is going to question, the big boss.

So, big boss has to have self discipline, you should not increase the overheads by profligate spending, in what is happening in our government. Every government that come, they say we must control the fiscal deficits, have you heard that fiscal? How do they try to do it, by cutting down on the expenditure of various ministries you know. Like our prime minister has recently said, curve on foreign travel, curve on this, curve on that, they are trying to reduce that, because all that is overhead, any questions?

(Refer Slide Time: 28:28)

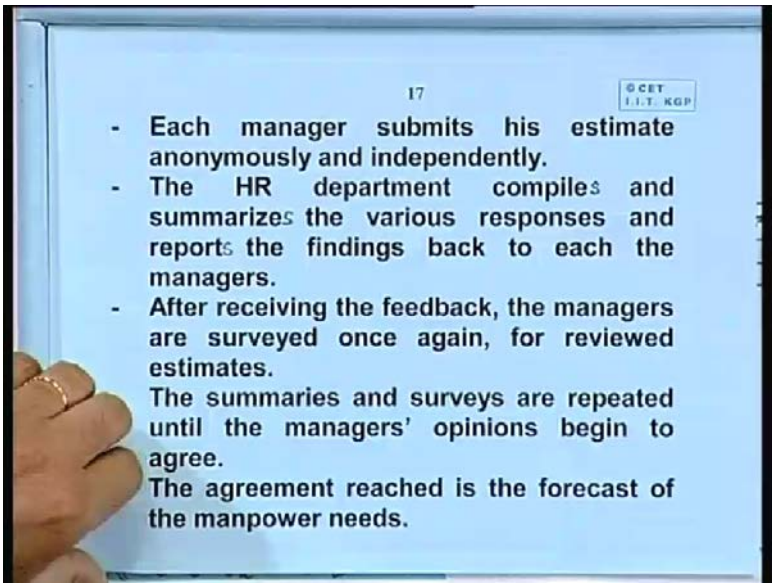


Now, we come to your question, what is the Delphi technique method? Now this is a more refined judgmental method, remember it is refined but, judgmental and in essence how do they refine judgment, by taking multiple judgments, that is the essence. My judgment, your judgment, his judgment, his judgment, if you take the premises; if you take many judgments, then we get the final judgment, which is more accurate than individual judgment, that is the essence of it.

And this is the process by which they do it; process is, hence it can be more accurate then the management judgment method; but, it is more time consuming, because of the process. The managers involved do not meet face to face; it is not meetings called in some room the following steps are involved the managers are asked to provide manpower estimates on a pre-designed questionnaire.

So, HR department after approval of top management, they make a questionnaire, like if he is going to sales people, what is the total volume of products and what is in rupee value done last year. Next question what is the forecast, which you have for selling next year? All right. Are you going to be in the same territory, where you sale or different territories if different, which are these territories? All right. What is the mode of travel tick off by air, rail, and motor car? Because time of travel your trying to and so, on they make a questionnaire. And the manager asked to provide estimates, based on a pre-designed questionnaire to HR department.

(Refer Slide Time: 30:44)



Each manager then submits his estimate or her estimate, anonymously and independently, you do not want to be biased; there are some managers who may be more powerful than other managers. So, HR people do not want to cut his thing, you know, so no bias, anonymous. The HR department compiles, and summarizes the various responses and reports the finding back to each of the managers. What does it mean, compiles and summarizes, for various departments.

For instance, let us say the production department has asked for manpower, finally after the questionnaire, which is 30 percent more, and the sales are asking for 50 percent more. I am just giving a case, this is send back to them so there the manager. I have asked for fifty percent more but, production people asking only for thirty percent, let me reassess, you know. May be I am asking for too many, because after all they have to produce, they are not asking, after receiving the feedback, the managers are surveyed once again for reviewed estimates.

So, HR says now, we are sending you back, look at it now and review estimates and send it back to us, do you want to change the earlier forecast. The summaries and surveys are repeated, until the managers opinion tend to agree, because if there is inconsistency between various managers after all it is a interconnected company is it not.

So, there has to be a cohesive picture, there cannot be inconsistency, one department wants too many, the other wants too few, for the same volume of production. Ultimately the company has got it is plan for the whole year, the whole plan; the plan has to match together. So, this is trying to make a complete whole picture of the total manpower required, which will be consistent with each other, the departments, so this is the attempt.

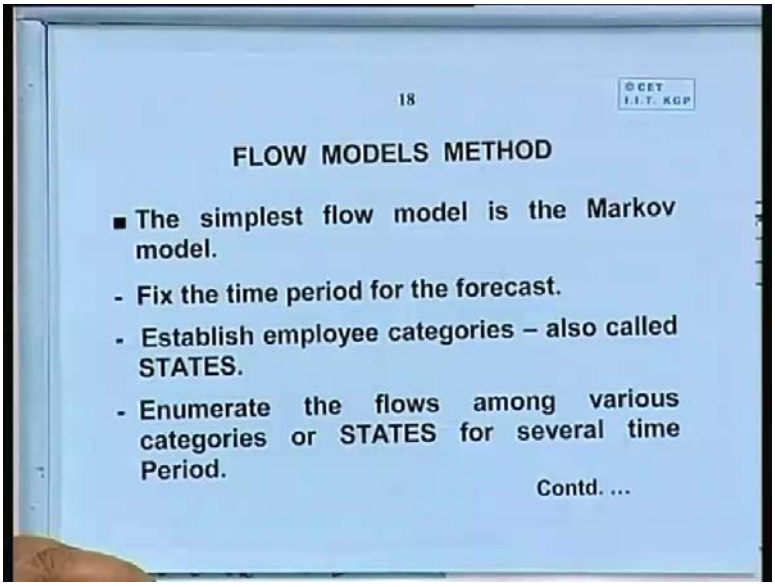
The agreement reached is the forecast of the manpower needs any questions? Why do they have anonymity, because often in group processes, when you have groups usually the dominant members of the group, all right if they sale with the dominant member, they would somehow convince the group. And the group will fall into a phenomena called group thing and the decision may be the sales get 150 and 140 although the production gets 120.

So, anonymity is usually used in group decision making, because this is a group decision making process, where individual members of the group cannot influence each other, that is why anonymity is used. The agreement reach is the forecast, now this is not very

commonly used in industry, because it is time consuming. And this back and forth you send a paper from HR department, and say please let us have your service by so and so date, usually it does not come by so and so date.

So, you have to give a reminder from HR department, still it does not come. Some departments send other departments do not send, so it becomes a kind of time consuming and difficult to administer. So what is normally used is either the management, it has been method for macro level I am saying or the ratio analysis, these are very popular methods, which are used. And for lower levels, particularly shop floor etcetera, where time standards are available, then of course, that is used work study method is used, any questions?

(Refer Slide Time: 35:11)



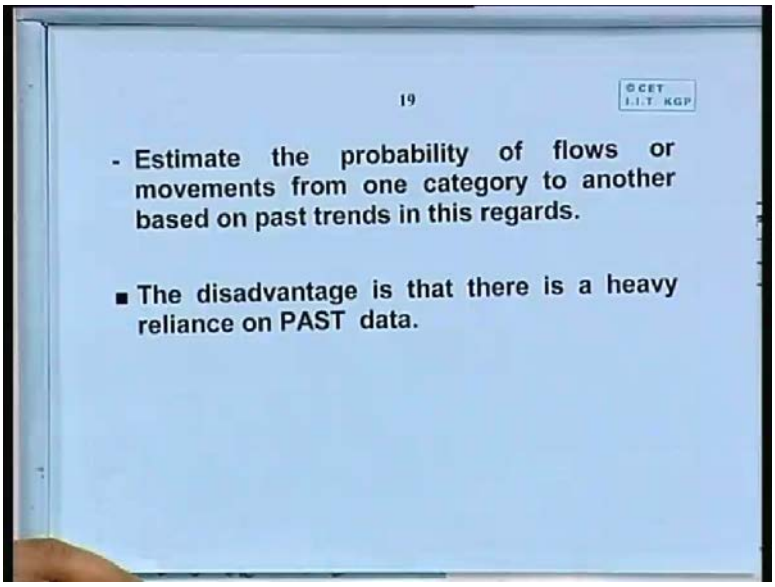
We have another method called flow models method, the simplest flow model is the Markov model. Fix the time period for the forecast, usually the time period if it is annual forecast is one year but, if it is a long range forecast it may be 5 years, may be 3 years. Establish employee categories and these categories are also called in this model as states. Enumerate the flows amongst various categories or states, for several time periods.

So, what could be the category, if you have daily rated workmen the category should be unskilled, semi skilled, skilled and highly skilled. If it is monthly rated workmen or employees as we call them, it could be stenographer, one stenographer, and two typists,

telephone operator, clerical one, clerical two, clerical three; this is a various classification grades pay scales, so this could be.

So, these are called states also and for several time periods. Enumerate the flows, flows means what, there always a flow we said people come, people go, people are promoted. So, as we said a highly skilled may be promoted into a supervisor he goes away from that, and may be promoted over 1 year, may be promoted 2 year, 3 years. So, for several time periods, the flow of manpower that you enumerate.

(Refer Slide Time: 37:13)

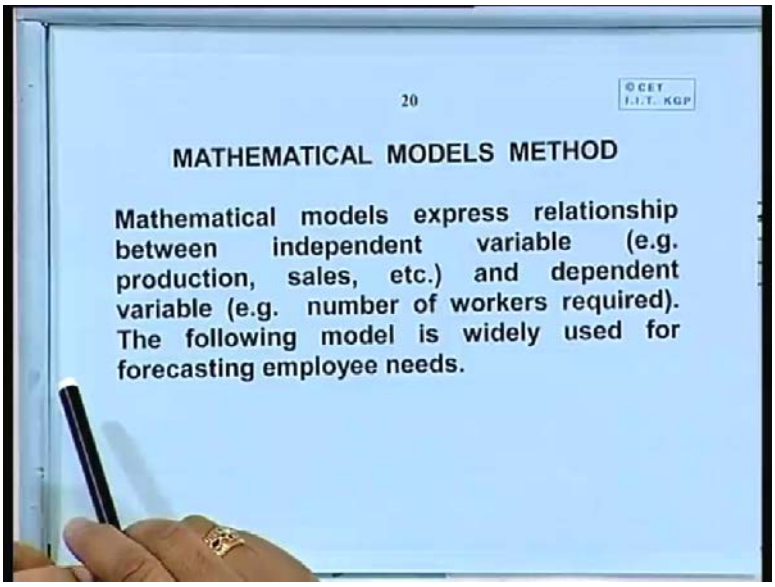


Estimate the probability of flows or movements, from one category to another, based on past trends in this regards. How many are going to be promoted, how many are going to be separated from retirement, how many will resign and go. Particularly at higher levels, lower level you do not find resignation as such, once you take someone he is there till he retires or he is sacked.

The disadvantage is there is a heavy reliance on past data. Everything you do, your doing on the past, unless you have some new projects which are on the anvil, some diversification project, where some of the skills which you will be required for the new project are already available here. Then you can plan that some of the senior people from here, would get a chance, some junior people would be needed from here to form a nucleus, which can start the operation of the new factory, till more are inducted.

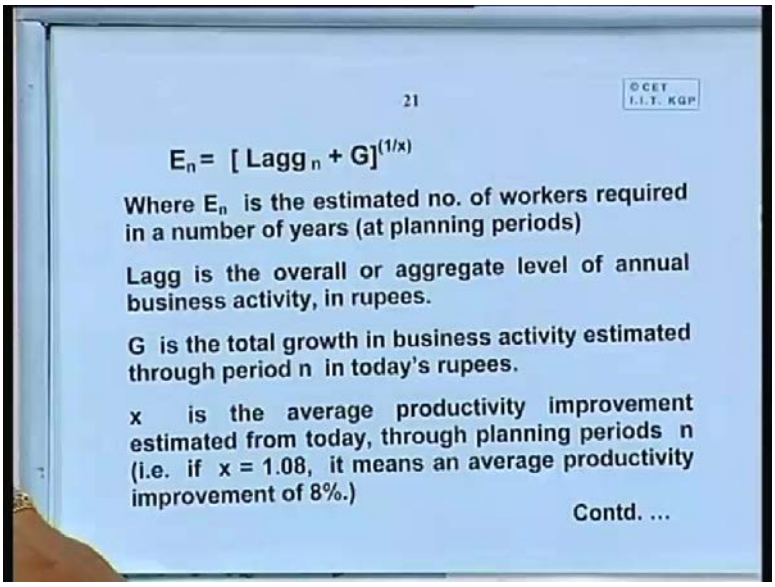
So, unless you have this that you have to factor that in otherwise you rely more or less on past data, any questions? All right.

(Refer Slide Time: 38:47)



Then last is we have mathematical models method, so mathematical models express relationship between independent variable and dependent variable. So, independent variable is production, for instance sales all right. And dependent variable is number of workers required, for example, the following model is widely used for forecasting employee needs.

(Refer Slide Time: 39:17)



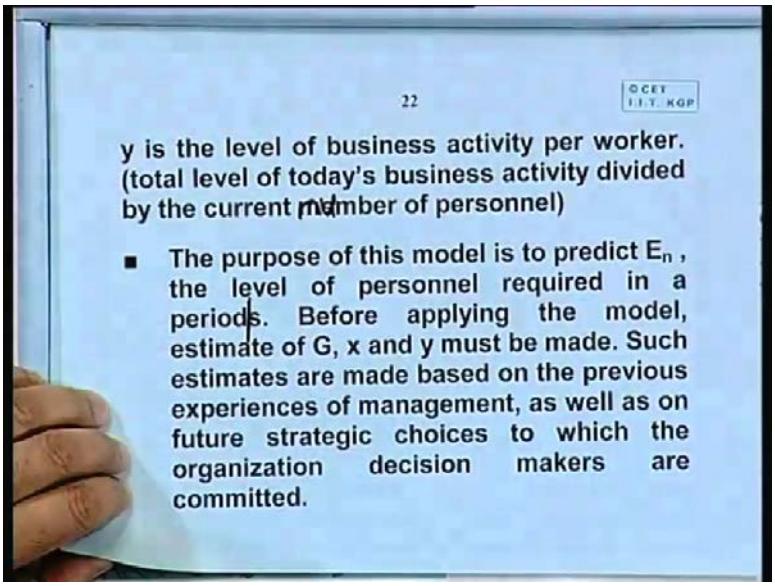
And that model is expressed as, E n (E lagg n plus G) to the power 1 upon x. Where E n is the estimated number of workers required in a number of years, that is at the planning periods, may be 1 year, 3 year, 5 year, 3 periods, you are taking, well aggregate is the overall or aggregate level of annual business activity, in rupees for the time period.

G is the total growth in business activity, estimated through period n in today's rupees. So, one estimate is put into this, remember how do you estimate this, you have the other methods available is it not. You may do it by management judgment method, what is the estimate of future business, you may do it by train analysis method but, this will be one of the inputs to this equation.

X is the average productivity improvement estimated from today, how do you estimate productivity improvement, you may have signed a union agreement in that agreement, they have agreed, to increase productivity by 10 percent. Now whether it happens or not, is uncertain, is it not it depends on so many factors, whether it is possible in the first place or union agreed to it, so that they could close the agreement, and get the salary increase. Whether, even if it is possible, whether the management has got the will to implement it, because when you sign the agreement, the money has been given.

The productivity improvement, the management has to see that by supervision and other means, they have to get the increase productivity but, this is an estimate which you put in productivity estimate. So, is the average productivity improvement estimated from today through planning periods n, that is x is equal to 1.08, it means an average productivity increase of 8 percent. And with this so you are factoring in the productivity increase.

(Refer Slide Time: 42:07)

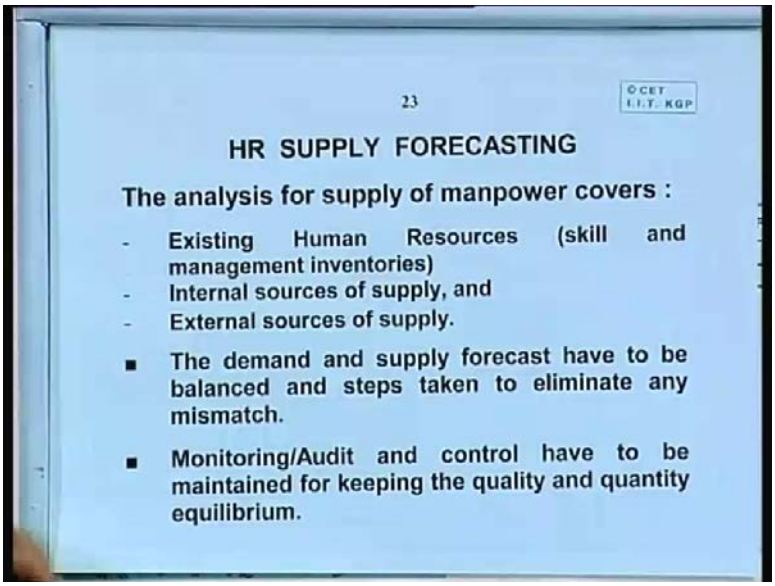


Y is the level of business activity per worker, today total level business activity divided by current member it is number of personnel. So, why is the level of business activity per worker, total level of today's business divided by the current. So business activity means rupees, for instance, so total level of today's rupees divided by current number of personnel. So again rupees per person, so that is why, it does not appear.

This is an adjustment then, in this model it is not appearing, y is the level of business activity per worker, total level of today's business activity divided by the current number of personnel; we will give a clarification on this. The purpose of this model is to predict E n, that is the level of personnel required in a period or periods, before applying the model estimate of G, x and y must be made.

Such estimates are based on the previous experiences of the management, as well as on the future strategic choices to which the organization decision makers are committed. This will clarify, because here it says why, is also an estimate right, it is not actual, whereas this says current number today's level of business. Today's level is known, it is not an estimate, so this clarification we will give.

(Refer Slide Time: 45:03)



Now we come to HR supply forecasting, so one was demand which is the need in the organization, next is the supply from where from are you going to get it. The analysis for supply of manpower covers existing human resources skill and management inventories Internal sources of supply, usually internal sources are by promotion essentially, you train people and then promote them. Normally, you train them on the job, sometime you give them outside training, and after that you promote them and external sources of supply. The demand and supply forecast have to be balanced and steps taken to eliminate any mismatch. Monitoring stroke audit and control have to be maintained for keeping the quality and quantity equilibrium.

So, this is the general process of human resources planning and to sum up you can say, HRP consist of trying to estimate what will be the required need of human resource in the future, maybe 1 year, 3 year, 5 year. And how to implement it, that is how much is required and how much is acquired, how to implement it by recruitment and selection. And also to see that in the process you balance, what is the estimate, with what is the final recruitment and selection. So that, the most economical use is made, all right all the manpower that you deploy in the company.

Another concept which we covered is, that in this HRP there is a nuance difference between MP and HRP, that is HRP is addressing the individual, the human and human

aspects. And M P is looking at the macro level of manpower, what classification, what numbers but, not individually as human being.

So, therefore, looking at individual human being, it concentrates also on such issue as motivating the human being, developing the human being, all right. And getting organization commitment from the human being. So these are the additional nuances, the additional areas which HRP.

So, you can say in that sense that MP is a subset of HRP, HRP is the total planning process and the implementation process. Implementation process I said earlier, recruitment selection, separation, etcetera. There are various departments in the HR department, total various subsections, sub units in the HR department each is concerned with the sub unit activities, any questions? All right. Then we will end today's this session and next time we will take up recruitment and selection, that is how to acquire after making the plan, thank you very much.