

Systems Analysis and Design
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Lecture - 04

Last time, we left at the Strategic Requirements of Information for Finance and also the Tactical Requirements for Information in Finance. We will now, look at the operational requirements. The way I have been telling you, about strategic and tactical and expanding fair amount of that. I am not saying too much about operational information, should not lead you to wrong conclusion. That operational information is not all that important.

In fact, the operational information is the most important part of any information system. Because, unless you have the operational information collected on a day to day basis, regularly and properly and without mistakes. It is just not possible to analyze that, to get the tactical information. And also, further analyze and get strategic information. The primary point that I am trying to make, is that operational information is essential to do anything, further in a system.

The reason I have been harping or emphasizing the need for tactical and strategic information is, many organizations are satisfied with collecting the operational information. And do not make much use of that. The point is that unless they make use of all the information they have collected, day in and day out. And analyze it properly. It will not help in making the organization better. And make it more profitable.

Profitability of any organization comes out of the tactical decision, they take and the strategic decisions they take. But, in order to do that, they have to definitely have the operational information, which you collect from day to day. In fact, a lot of the emphasis in this course later is going to be on designing operational systems. The sense is that, the operational system as I said is the raw material, from which you start to do anything.

So, this importance is to make sure that the raw material is properly collected. And you collect the raw, collect the correct type of material. In other words, you have to collect the operational information, which is essential as I said. But also collect all the essential ones, which are the basic requirements to create the tactical and strategic information. In

other words, if you leave out some of the operational information collection, you may not be able to take certain types of tactical and strategic decisions.

So, it is extremely important to be able to in some sense work backwards. That is you ask the question, what is the ultimate objective of meeting the strategy and tactics of my organization? In order to meet, those strategic goals and tactical goals, what is the basic data required which I should collect. And so, unless you work backwards, you may end up in a situation. Where you collect all types of irrelevant data and forget the important relevant data.

And this is being happening in many many situations. And it is somewhat difficult rectifying situation, because it takes a fair amount of effort and money to collect this operational information day to day. And put in a data base, in a properly organized way. And if things are missing, when you really require it, then it is too late. You just, time is past. And you may have to do with whatever you have.

So, that is very important to collect thing, a little bit here. In terms of the, what is the necessary and sufficient data to be collected at the operational level. In order to be able to use it for other purposes. So, this must be clear in your mind. Now, coming back to financial management, the operational information, which is normally essential to be collected to feed to the tactical and strategic part of the information system. You must have a periodic financial report.

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INFORMATION FOR MANAGEMENT

Finance Management

Operational Information

- Periodic financial report.
- Budget status to all functional managers.
- Tax returns.

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In other words, you have to have clarity in terms of how much money has come in as revenue? And how much is being spend, how much is being spend in various budget status? They call it as different areas, that is one of the. In other words, I have spent in salaries. How much I have spent in buying materials? How much I have spent in buying certain finished product? And elsewhere, how much have I spend in my marketing efforts?

All these parts, in terms of the different areas of spending has to be collected. And periodically report has to be also generated. The period may vary. It may vary like month after month or every week after week depending upon the requirement, of the management. But, legally at the end of 3 months or what is called the quarter? Every company is supposed to create a financial report, to be submitted to the share holders of the company.

And also made public in the news papers, for the information or the public at large. So, that the share holders know, what is the actual state of a company? This of course, will not have everything about, everyday what I expect. But a quarterly report, in terms of end of the quarter. Consolidated account of what, I have spend under various account. So, that the share holders kind of understand what has been spend in for what areas?

And is the company doing well, in terms of revenue they are earning. Compared to the expenses, they have made. And is there a profitability just coming. What is the earning which they are getting for a sure they have bought many things like that. That is called financial report, which is as I said periodicity varies. But for top management information, the periodicity may be anywhere varying between a week and a month.

It is not at the end of the quarter. You do not give the entire information to the top management. You have to give it much more frequently to the top management to be able to take some corrective actions, before it is too late. So, operational information of having this financial report and selling it up the chain, in terms of higher levels of management in the hierarchy is the job of the people, who do data processing at the operational level.

Similarly, budget you know at the beginning of the year, a budget value for each of different areas in the company, the functional areas. We talked about the functional areas, which is production, marketing. And now we talk about finance, R and D, human

resource. There are many primarily 6 areas of functions. For each of these areas, I have to create a budget at the beginning of the year. So, that the main idea of a budget is that, an overview of what I expect to earn this year.

How much do I decide to spend? And what is going to be taxes which are going to be. And what will be the net income, which will come to the company. And hopefully, there would not be a loss. I mean, when you make a budget. You do not make a budget for a loss. You always make a budget, which is somewhat little bit closely in terms of your revenue picture. That is your earning picture.

And on the other hand, as I said corrective actions need to be taken, if it is updated regularly. So, budget status periodically a gain. A period may be say every two weeks or every month. Normally a month is not bad. But, it depends on the nature of the company. And what is meant by budget status? Is that you effectively say, this much of money is allocated to your functional area. You have spend this much money.

And this much money is left over, by spending. So, that if you over spend of your target, for that particular period in your mind that. Then, you take corrective action. Either you have decide to say, I am not spend enough. I would try to spend it more. And also, if the top management also get this information on how much the, what is the budget status of the all the different areas?

If they find that, one particular functional area like say the R and D manager, has not spend any money at all or much much less. Then, what you have allocated? Then, there is likelihood, that he may loose that money. Because, the guys in human resource may have over spend. And so, their budget may be in the negative side. So, you might reallocate your budget. Saying that, because you have not spend the money. You do not probably need it.

So, I will give it to somebody else. So, there is always a it is not does not mean you should spend the money unnecessarily. But, you should make sure that what you budgeted, you properly planned. So, that in order to do that you have to inform. And that information, comes from the operational information. And of course, for the finance manager he has to produce, so called tax return. That is every month, there is something called taxation directorate source.

If for a employees salary, tax is due. And that is detected from the salary and directly paid to income tax department. And wherever you are distributing money, to different persons depending upon the law, I am telling you in a given time. You detect the appropriate amount of tax and deposit in the government account. And you make that periodic report of a, so called TDS. And nowadays, of course a new tax called service tax, which has come.

And for various services, which the company receives the service tax is got to be also ((Refer Slide Time: 13:38)) And is got to be deposited in the account. So, it is a question of a if you are a service organization, you have to collect you have to show, how much of services, what services you have done? How much money you have collected? And what is the percentage, which you have to deposit?

For an example, what I mean by service tax is suppose you are running a travel agency. If you are running a travel agency then, you are taking commissions from the airlines to kind of a depending upon the amount of sale, which you have made of tickets. On this commission, which you have made which is your earning? There the service tax is due. Because for the services, you have provided to the customer. Normally most of it is passed on to the customer. But the responsibility is on you. Who actually put the money back into the government's account.

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INFORMATION FOR MANAGEMENT

Finance Management

Operational Information

- Share transfers.
- Profit and loss account.
- Payments and receipts.
- Payroll, provident fund accounts.

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Another operational information which is required is share transfers. Every public limited company which is shared in the market. In share market, everybody every everyday you will hear the rumors, about the sensex. And the nifty and things like that. These are all the reports of the performance of the share market. What is the average or the share percent is going up or going down and things like that.

So, share transfers means the people who have own shares in the company, can buy and sell. Whenever somebody buys and sells, you have to transfer the shares or in other words the owner sells it. And another person buys it. The owner who has sold it, you have to remove his holding from your account of his share holdings. And credited to the person, who has bought.

In other words, the share holder account which every company is suppose to maintain because, the share holder is ultimately the person who is making your company work. That is his money you are using, to run the company. So, that is important even though. So, called people who start the company called promoters, have certain amount of money, buying large, most company is turned out to the promoters share, is less than about 10 percent of total profit of the company.

Almost 90 percent of the capital comes. Not only from public, but also from the financial situations like banks, may be insurance company. From primarily, many of the what there is called financial organization, which invest in shares. So, of course now a days in India, mutual funds are very very prevalent. So, mutual funds also own fair amount of shares of a company. And they in turn, get it from their clients who go to that much of fund.

But the primary share transfers have got to be kept. Apart from share transfers, the operational information which has got to be given is also that, what is the price fluctuation in the share over daily? And at the end of a quarter, you have to tell the share holders as well as the management that, the highest price at which the share was sold, the lowest price at which the share was sold.

What is the average price of the share being the quarter? And also how many transactions took place during that quarter? That is how many shares are traded. Because, higher the volume of trading of shares. That means the more interest in the company in

the public. If their trade in volumes are very low, that means people consider the company to be almost dead. Because, they are not much interest in buying and selling.

People buy and sell shares of companies, which are doing well. So, that is also another piece of information to the share holders. And of course, profit and loss account. That is what is the, how much profit I have made? Of course, profit and loss account is not a daily thing. Daily you collect the information. Collect all the data about sales about receipts and so on. But profit and loss is consolidation at the end of say a month or two weeks, so whatever.

And that means, how much profit is? Very simply speaking. You subtract the money, you have spent. From the money, you have collected and the difference is the profit. If it is the difference is positive, then it is profit. If the difference is negative, then it is loss. So, at least you really know if you are making a loss, how much loss I am making? How can I make up for that loss? So, that at least by the end of a year I come up with a profit.

Normally people say, a company is in the red, if it is making a loss. Because they normally view, red ink to show a negative value and a black ink to show a positive value. So, if you say a company sample is black that means, the company is doing very well. It is got a good profit. And it is red means, it is down. It is not making any profit. So, this payments and receipts, you owe money to your suppliers. You have got to pay as well as I said.

I said if you buying a store from some companies, some items. You got to pay as soon as you check this quality, and taking this to stock. So, unless you pay regularly and timely payment, your supplier will also delay his supplies. So, to get timely supplies you got to pay in a timely fashion. And so, those kinds of a payments and regular payments, generation of bills, generations of cheques and things like that, have to be automated on a computer.

Nowadays, cheques are all printed on the machine. And cheques are all mailed out to people. And also, there is a trend where the cheques may not even be mailed. If you give that account number and which bank you are holding an account. The money can directly go, so called the electronic claiming service. That is from near bank account, it can directly go to the bank account of the person who billed you without going through the intermediate area of courier or post and so on.

So, there is no possibility of loss of the cheques. And also the advantage of, so called electronic clearance is that the clearing or depositing from one account to other account, is almost instantaneous. In other words, if you debit your account it gets immediately credited to another account. So, this is the way something which has come out of networking and computerization.

The automatic electronic clearing service, which clears your cheques and lastly of course, you have provident fund, you have to payroll. And these are two important things. Payroll is month after month. You got to be able to create your pay roll for the employees. What is mean by payroll for the employees? Is that the gross paid, which is given to the employee. The reductions which you make for the various purposes, like you make reduction for provident fund may make reduction for taxation.

So, there are number of deductions. And after you reduce all these things, you have a net payable. And that net payable is, what is normally deposited directly to the account of the employee. So, there is a this is called payroll. Payroll is periodic. Every month, normally in India every month a payroll is created. And the payroll, at the end of a payroll automatically all the debits and credits to various accounts take place.

And this is a essential operational account, operational information. And based on payroll itself, you derive the taxation. And this taxation is a direct source, because you are not paying employee the tax. Once you redact, that directly go to the government's account right away. You cannot delay it. If you delay it, then you are supposed to be acting against law. Because what you have done is, you have already taken money from somebody but you are not giving it to the person, to whom it is due.

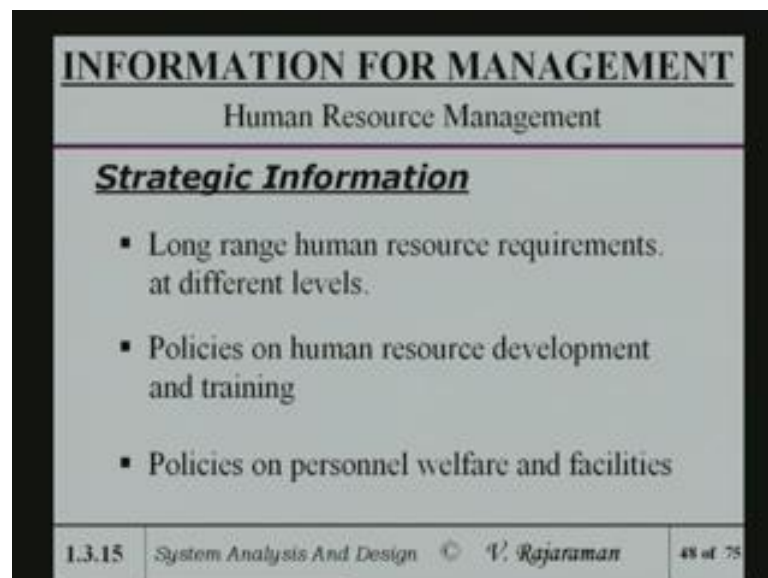
So, naturally the person whom it is due, will complaint. So, you have to essentially be able to deposit it. So, called tax deduction source immediately, as soon as you reduct it. Similarly, provident fund is something which is new for the employee, for the retirement of the employee. And there is certain amount of prime fund which is contributed by the employee, the same contribution by the company.

So, theses two together would go into provident fund account, which may be with a third agency. It may not be kept in your company. So, this provident fund reduction also has. By law has to be deposited within a certain period to the provident fund authority, whoever is running that authority. So, both provident fund and TDS are statutory got to

be deducted and credited. And these are things which are which comes as a after ((Refer Slide Time: 24:16). This is operational.

It is month after month after month. And of course, in some foreign countries payroll may be even week after week after week or even two weeks after two. You know the America for instance is two weeks, you get paid. And in some other counties like Australia, it is every week you get paid. So, this is depends upon the way which a particular country who has. In our country, it turns out to be normally monthly, you get paid. You do not get in a more frequent interval.

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Now, the next area which is extremely important nowadays in any organization is human resource, because the economy of the country of the entire world is changing. The Economy is changing and going towards. What is known now as Service Economy? And service economy depends very much on people. What I mean by service economy? If you take our country for instance, the number of jobs which has grown very rapidly is in the area of software services.

That is software companies, which are actually doing software work for companies abroad. So, these are Software Services Company. They are creating programs and software for many clients. And those clients are very often not in a country. They are outside the country. Now, the call centers, which are all there which essentially depend

upon people. The people are the ones who are manning all that computer terminals and telephones and so on.

And answering all kinds of question, which comes from all over the world and sometimes, even subject to abuse. But, by in large call centers are very large operation in terms of great in employment, particularly for the younger generation. And they work 24 hours a day, 7 days a week and all types of shift early morning shifts and so on. And that, by in large the point I am trying to make, is that human resource is there. It is important to be able to keep your human resource happy.

And have the right human resource to be able to do these kinds of businesses effectively and make a profit. If it turns out, that your human resource is not all that happy with you. Then of course, they will leave you quickly. Because there are competing companies, which are willing to offer them better terms may be. Once they get experience and so on. So, it is very important for companies to pay attention to the human resource, because there is a asset of the company.

Now, the strategic information which comes to human resource management is long way requirements at different levels. How many people do I require for the coming year or so? So that, that estimate required to be able to recruit. And also recruit it to the right levels. Or all the all of them may not be freshers from colleges. Some of them may be, substantial number of them may be freshers in colleges.

But they also require people with experience. Say if 3 years experience 4 years experience 10 years experience and so on. And they also require people with expertise in different areas or functional areas, like somebody who has experience working in a finance company. May be required for a creating a software for mutual fund or if you are working with a hospital management system and so on.

If you are going to create a information system for a hospital, then you have that knowledge about how the hospital functions? What kind of information do they require and all. That will be useful for a person for this company. Because according to the trying to sell their services. So, experience is essential in such a case. So, the top management has to decide, how many you have to employ?

Because once in a while, you see newspapers saying Infosys has announced this year, they are going to recruit 4000 people or 5000. This company also makes a note that they are going to recruit, so many people. Because as I said, human resource is an essential part of all these companies. And when they say I am going to recruit 4000 people, what it really means? It is in general public is, that the company is doing well.

So, they are going to recruit more people because, they have lot more jobs. And that is essentially, what the top management has to decide. How much they recruit? They can also publicize it or just keep it is within themselves. But by in large the companies have, they do publicize it. And how to train and develop them? And this is also very very important. Because when a student comes out of a college, no company expects the student to become productive from day one.

They all train that student, and they only want trainable students who come. And put them to some training and the training is reasonably vigorous. And the training time is something which is well spends. Because the student really comes to know about, what the company does, the culture of the company, the prospects of the company and communication skills.

Many other things, which are important for running a software business for instance is taught in the training centre. 3 days ago, I saw big article in a magazine called Fortune, which says the Taj Mahal of trading facilities is again setup in Mysore by Infosys. It is you have pictures. And in other words, huge trading centre which is been setup. Because, they are going to direct train 4 to 5000 people every year.

So, they had hostels, they had teachers to train them. They had computers and so on. So, these expenses have got to be decided. And you also have to look at the policies and what payment do I give. And, how long is it? 2 months 3 months 4 months goes those ideas. And also policies, on the welfare and facilities. That is, what kind of policies do you have on for the welfare?

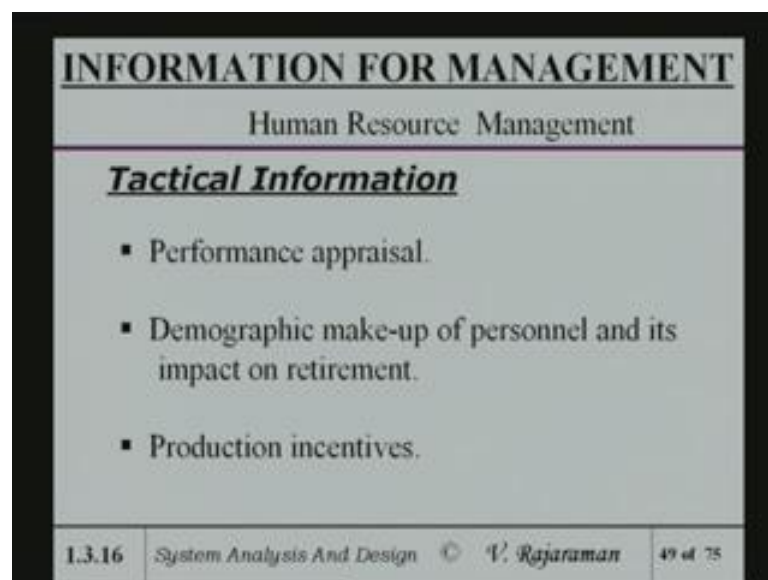
One of the important policies, which many companies follow now is known as ESOP, that is Employees Stock Option Plan. What do you mean by Employees Stock Option Plan? Is that, when a employee joins a company they tell them, that I will become, I will make you a share holder of the company. So, you have an equal state in the profitability

of the company. But these shares will not be given to you, unless you work for the company for 3 years.

And then, after 3 years I will give you the share. Of course, not at zero cost, but I will give you the share at reasonable cost, determined by the current share price in the market. May be I will give you some condition whatever. That kind of decision is called Employees Stock Option Plan. And that is a very strategic decision, whether to do it or not to do it. It is the top management's requirements.

And it is, it has there are both prose and cons for this. Some companies give you ESOM. Some companies do not provide you ESOM. But these are things, which are strategic requirements of any top management.

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And tactical thing, tactical information consists of a performance appraisal. You know, you have to highly appraise the performance, because performance appraisal in the sense important to be able to promote a person to higher positions.

And not only that, in many other companies today, the yearly increase in salary is not automatic, in terms of a certain increment which is normally what is being done in government. Government has an increment year after year after year. And there is no change in increment. Whereas, companies prefer to make a variable increment. If you

perform very well, they will give you higher, what is called? Raise in your salary or increase in your salary.

If you have not done too well, then they give a average amount. Of course, they will not reduce your salary, but they will not increase it too much. But there is a policy has to be done, in terms of how do I appraise? And how do I use this appraisal to be able to improve this or increase the salary of a person, or do appropriate incentives for the employee. So, there are many use of performance appraisal.

Very often, many companies ask for a employee to give self appraisal. See at the end of the year, they ask what is the thing you have done during the year? And give a certain form for him to fill up. And then, the manager finds whether what the person is told to? What extend that is right to, what extend it is not right and so on. The point is that some extend they try to make, the employee also feel that, this is part of the appraisal process.

So, these are kind of psychological things which a tactical manager has to look at. And, democratic make up. What is meant by Democratic Make Up of personal is that, or there you know it turns out, that in some companies not in InfoTech. Because in InfoTech companies, almost everybody is young. You know, they are all their average age will be around 30 or 35. Person who is 50 years 55 years old is concerned as a old man in a IT company.

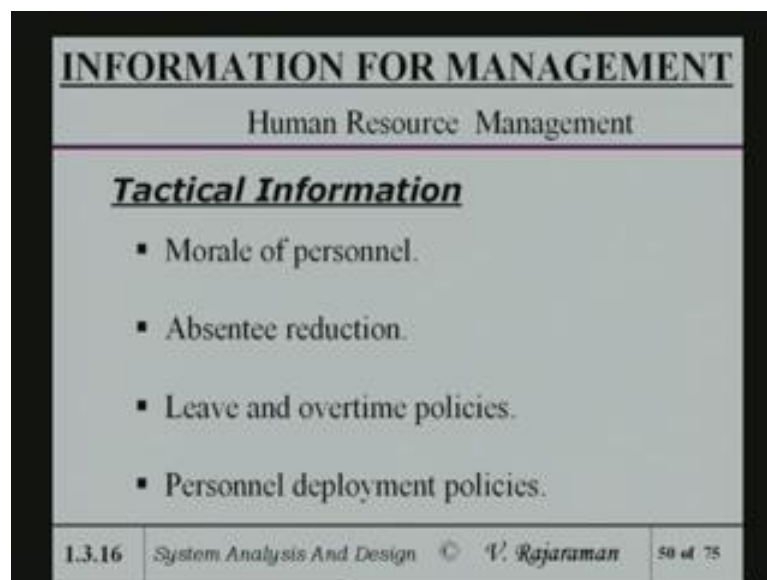
But if you look at normal companies, what I mean by normal companies are the older like automobile manufacturing, companies like Tata engineering or the company which is heavy electrical, Maruti heavy electricals or Hindustan aeronautics. Many of the older companies have employees in all age groups, from the top from the ages aging from 60 to 20 25. So, it turns out that there is a lot of people nearing retirement. Then, they have to make sure that, because the people who are experienced are going to retire.

So, you really have to plan ahead of time. You would not bunch everybody, who is retiring at that time. In other words, you try to make sure that, the same kind of demographic makeup and planning. So, that you enter fresh blood as well as people at appropriate experience at different levels. So, that your demographic makeup does not make system fragile, in terms of saying that.

Suddenly, who are the people going to leave in a very critical area of a company? And in a production company like a car company, they have to decide is there any production bonus. In other words, if you come up with higher productivity, you have to have some measure productivity and you come up with better higher productivity. Then they will give better incentive.

Somewhat like you know, software company may be apart from productivity type. Productivity might be error free code, which comes out. And other words, good quality code comes out and you have met the minimum requirement and exceeded it, in terms of your quality as well as your quantity. Then, you may be given a production in certain. And the other tactical information is in terms of morale of people.

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Keeping the morale high is very very important. So, you have to kind of access periodically, what is the morale? Or are that too many people leaving. See if there is a person who is leaving, normally most companies try to talk to them. Why is he leaving? He is called, employee when he leaves is called debrief insertion. Manager kind of sides or that of the human resource sufficient, sits with the person to find out what is dumping him?

You know there is something which is, he is unhappy about which can be rectified. So, that other people also do not start leaving. So, the morale and wipe there is too much turn over in a company. So, the turn over always turn over is expected to around 15 percent in

a company, which is normal in many other InfoTech companies. Suddenly it goes to 30 percent then, there is something wrong you know.

And higher turn over means that you have to recruit more people. And you have to train them. So, it is a cost. So, unnecessarily your cost is going to increase. So, you have to make sure the turn over is reduced. And, how to kind to reduce the turn over. Of course, you know many companies give all kinds of facilities, to make you happy. So, that you do not leave the company. EPSOM is on such thing.

Absentee reduction, if there are too many absentees may be they have to start a crèche. Creche for the ladies who have children, who are absent too often, and so on. So, these kind of absentee reduction. Leave and overtime policies how much is it? 15 days leave in a year, it is 1 month leave or do you compelled them to take the leave, or do you give money instead. Many companies have policy, but you have to take the leave.

And you cannot enhance that leave, because they feel that leave is required for you to refresh yourself and come back. Another important thing in many of the companies, is in terms of the training of the existing people. See there is a training of the inductives or it to be freshers, it is essential for 4 month or 5 month, whatever is fairly a long period. But training of people who are already there, is also very essential because particularly in our field, the technology is changing very rapidly.

If I say something about InfoTech because I know more about it, but then technology in all areas is progressing very fast. Even in motor car production now, 5 years ago many motor cars did not have any microprocessors, for control of the various functions of the motor car. Today almost every motor car has got one or two micro processors. It is inside them to be able to get better performance, out of the motor car.

So, technology there has changed. The old technology has gone. And similarly the calculator and other things are all changing. So, this need for updating the knowledge of older employees. Because, they have studied much earlier and there must be regularly upgraded. So, many companies have policy. Saying that every year, just like giving 15 days leaves there will be 15 days allocated to training.

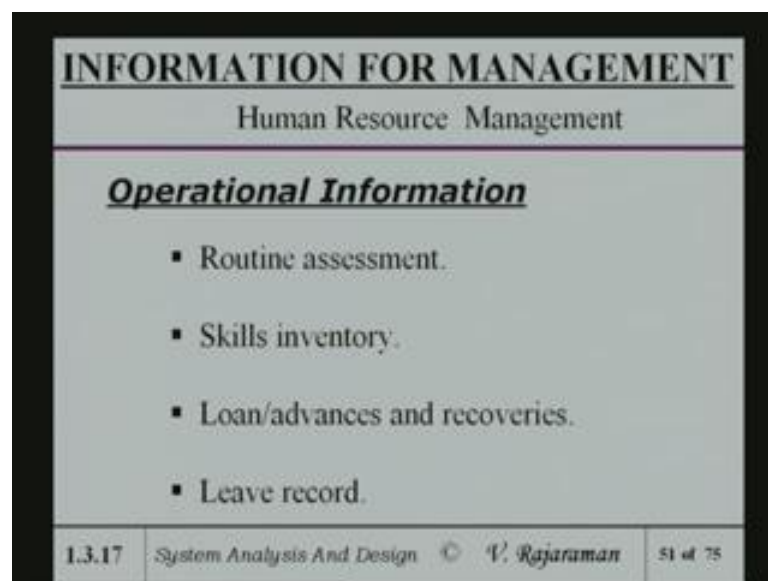
And some companies, even go up to a extend of 1 month in every 12 month, 1 month the person is got to be trained in terms of upgrading the skills. Upgrading the knowledge,

because they are all knowledge based companies. All these are knowledge based. And more and more company here becoming knowledge based, as I said in 21st century is suppose to be century of knowledge based industries.

And that is one of the reasons, why we feel that we have an edge because, we have a lot of very very young intelligent people. And they can be, they can compete very well in that knowledge area with the seen world. So, upgrading and training is also very important. And deployment policies in other words, you know if a person is working in one section for too long, the person may get bored.

So, you may transfer the person to some other areas. And give a certain width or breadth of experience in different areas in the company. So, that he gets matured over time. See if you are doing the thing, again and again and again you feel somewhat bored with that job. So, it is better to kind of train you and shift you to something else. These are the deployment policies, which the company has to consider.

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The all these to be able to get all these things, you require operational information. As I said, you have to collect it in a regular basis. The tactical information I talked about, a fair length because as I said, this is quite important. Now, the operational information which is required to be able to get this is the various types of data which you collect, like you know you have high in asset person, routine assessment.

You have to kind of keep a record of, what is the kind of you may decide on certain grades, which you give to certain employee. And that has got to be recorded in the employees record. So, that is the record which is kept for each employee. And routine assessment records and what incentive has given has to be noted down in this record, for the employee. And you have to add for the whole company, the skills inventory.

In other words, we keep a complete picture of all the employees in the company. What I mean by complete picture is that, you have the name of a person, number of years in the company, the areas in which the person has worked and general performance which is worked inner the areas. And what is the kind of specific space, he has. In other words, if he is a java expert that is he is expert in particular language or he is a visual basic expert. Or he is a person who is done a lot of work in data bases or it can be somebody who is expert in finance management.

So, there may be functional areas like suppose a finance company is coming to you, then there is a person who could be deployed for that. So, once you have skills inventory that is knowledge based. In terms of what knowledge they have and their experience levels and so on and performance level. When a new project comes to your company, before you accept the project you say whether you have able to source available, for the project to be successfully completed.

And also reallocate people from this. What I would say, the database of skills and take out people. And form a group and make that group responsible for this new project. Just come to the company. So, skills inventory, loans advances recoveries and so on. That is these are the things which every employee is given a loan and recover it and things like that. Leave record, how much leave the person has taken.

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INFORMATION FOR MANAGEMENT

Research Design & development Management

Strategic Information

- Which products are to be developed?
- What types of improvements are required?
- What long range research is more promising?
- What technical collaboration would be appropriate?

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And these are all the things, which deals with the human resource. Last functional area which I am going to talk about is R and D, Research and Development. In that mean, I would call it Research Design and Development, because many companies have also design requirements. What I mean by Design Requirements? Research and Design is, if you take say Product Company which makes products like a motor car company, which makes motor cars.

And you really need to have a new type of model coming out. Then, this you have to do some kind of redesign of some existing car. And that redesign is something which is a part what R and D does. That is design part is there. Similarly, if it is a electronic product. We have a design part, which is done for that further product that looks like the product and things like that. So, this is primarily what really I mean by Research Design and Development.

R and D Research and Development is extremely important now a days in many many new companies. Is crucial in pharmaceutical companies, so called biotechnology or pharmaceutical companies, actually invent new drugs. They invent new drugs for curing certain ailments. And these drugs had to be produced fairly fast. Even though, one would like to have the production very fast in terms of the production way of the medicine or the molecule which is used for say, fighting certain types of viruses and so on.

It requires a fair amount of research in looking at a lot of compounds. I might find out, which are the effective compounds and which are not the effective compounds. Which computer simulations are used and human trials are used. So, there is a lot of work which goes on in the research, and before any medicine comes in the market. And even, when there is a medicine which is available in the market, if you want to reproduce it you have a new design in a plant.

So, this plant design also requires a fair amount of work to be done. As I am talking about R and D part of many functional area and importance of R and D. So, we look at the strategic requirement of information, the company has to decide what products are to be developed? If it is a pharmacy based company, they have to decide what products they have developed?

If it is an electronics company, they also go to decide what products? Even if it is a motor car company, if they are producing a certain model what new model you have to come up with and so on. What improvements are required in the existing products. What long range research is more promising? Look at the long range and what is up and coming. And do I look ahead a little bit and do something about it.

And with technical collaboration with another company, which will be helpful from my company to make my product better. So, these are issues which the top management has to look at. And this is crucial in terms of long range, what direction the company product will take? What direction I will have to? Like simple example I will give is that of Apple computers.

The Apple computers was one of the earliest computer makers, who is making this desktop machines. And they are the first one to come up with the ideas of window. And it is later on borrowed by Microsoft and made more popular. But Apple computers, even though their machine and there, general user interface was much better. One mistake they made was to make their hardware, is strategic mistake effectively.

Is that, the hardware was, details are not made to known anybody. So, nobody else could really make any kind of software for it. And in the operating system which they make, to make up application system for their operating system, that is not easy. Whereas Microsoft has strategic advantage of working with an open architecture of IBM and so, they have a much larger market.

That is not a proprietary market unlike apple. So, the apple sales were going down. They went down considerably and out of the say 100 machines sold in the world. About 90 machines or 90 to 95 machines will be IBM machines. IBM architecture machines and about 5 percent will be apple architecture machines. Even though, the apple machines are superior, in terms of the quality and so on.

Now, when we thought about this, they said they have to probably come out with a new product which is going to capture the market. So, they came up with. So, called i pod which is a music download device, where you can download music from internet. And for track, you pay some 99 cents in America and so you kind of come up with latest hits and so on. You can download at your ((Refer Slide Time: 52:20)).

So, somewhat like your earlier Sony's machine, with the tape and so on. Now, it becomes lot more interesting for young people, because there is a portable small music player which is very good quality and also good looks. In fact, apple spend a lot of time steve jobs. Spend a lot of time in designing on looks of that, looks and feel and user inter phase. So, it is easy to use. An ill person can use it, that is quite rapid and so on.

Of course, technology has right things like flash memory scheme, internet scheme all those things made it possible. But then the question is, he suddenly decide it that computers are not really making much money, why not I go for a new product, which is quite different from what he is doing but, somewhat related. It is also based on micro processor and so on. So, this is what is meant by new product development and get into the new products.

So, as I said improvement is of course, a gain always important to like for instance, if you take operating systems. You know there is a version. If there is a windows 2000 is there, then suddenly they decided they come up with windows x p. Then, they said windows x p home version. So, whole idea of whatever went on with all these product changes, are quite upgrade as they called it. It is to kind of have a market continuously updated and getting to sale new products, as you go along.

If they do not change the model and make the product somewhat better, at least in the perception of general public. Then, there sales will becomes a kind of stagnant. So, they cannot have the new revenue, which is coming in. So, these are the kind of things which the top level has to take up. Like now, Bill Gates is looking at the next generation,

operating system for the beyond windows. And they always has in the market and put things in the internet and so on.

But buy in large it is a, it is going to be some change which you come out of the strategic decision of in this case of top management namely, bill gates and company. And the way you looking at long time research, what techniques these are the ideas of strategy.

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INFORMATION FOR MANAGEMENT

Research Design & development Management

Tactical Information

- Setting intermediate goals.
- Checking availability of equipment & appropriate selection
- Determining proportions of resources to be allocated to different projects.

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Tactical information for tactical recruitment under R and D, is you have certain goal to meet in a certain time for research. But you cannot ahead of time. Decide what exactly, what path I have taken in research. Because you do not get the expected results as you go along. Because you are doing something new, which is not something old. So, you have to set up inter intermediate goals.

What progress I have made, what I thought I would come, how do I change my part and think that type. And also, I have to check the equipment availability and select the appropriate equipment for the type of work I have to do. And proportions of resources allocated to different projects, I do not have many project going on simultaneously. And for each project I allocate certain resources.

And have a kind of monitor to determine the proportion. And I determine what proportion to report on what? If something is promising, I put more money on that.

Something which is little too long doing and not too promising, I put less money. It is the tactical decision taken by the R and D manager.

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INFORMATION FOR MANAGEMENT

Research Design & development Management

Tactical Information

- Deployment of personnel to projects.
- Information on similar and related research projects undertaken by other companies

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People, which who are the right people to protect the right job. For the research particularly and design, it is extremely important to put the right people in the right job. Otherwise it becomes, you know as I said in a square whole or in a round whole and things like that, wrong choice of people. And information are somewhere related to the research projects undertaking the competitive companies.

In other words, is there competition which is going on. As there competitive companies which are also doing something similar. And what should I do about it. Should I change my direction?

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INFORMATION FOR MANAGEMENT

Research Design & development Management

Operational Information

- Progress against goals.
- Budgeted expenses versus actual expenses.
- Status of outstanding orders for equipment and components.

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And as soon as the operation are concerned and look at the, what is the goals you have set? What is the progress I have made against the goals? How much money I have allocated? What is budget that is how much is allocated and how much is the actual expense over spending or under spending?

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QUALITIES OF INFORMATION

<u>Quality</u>	<u>How to ensure quality</u>
▪ Accurate	Ensure correct input and processing rules.
▪ Complete	Include all data.
▪ Timely	Give at right time

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What is the order equipment? Are they are outstanding?

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INFORMATION FOR MANAGEMENT

Research Design & development Management

Operational Information

- Progress against goals.
- Budgeted expenses versus actual expenses.
- Status of outstanding orders for equipment and components.

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And is there any outstanding kind of product, which is there? These are the things, which you have to kind of look at. Operational information you have to look at the progress against the goals. And that is day to day and day to day you have to see that. Budgeted expenses, what is the actual expenses and status of outstanding orders?

So, these are issues which are in R and D. And there are also lot of other things which are to consider in terms of R and D, which I have not given in great detail. Things like as I said the, particularly the critical part in terms of deployment of people and so on. So far, we have essentially talked about all functional areas. The areas the requirements in the strategic requirement, the operational requirement, the strategic, tactical and operational requirements of all these areas and explain all these if reasonable length.

And I have some clear idea of the distinction between these. And also the fact, the operational information is essential to get the other information. Now, having done that next question you have to really ask is, what is the, what is really, what information I provide have to ensure, that the information is right quality. The question really is, what is meant by quality of information?

When I talk about quality of information, the number of parameters which I have to consider? So, it is a very, quality is sometimes in the mind of people. But not always true. So, you can also quantify, quality in a specific way. So, the idea is to be able to look at the different components of the quality. And make sure that each component, that quality requirement is made, in whatever information system I design or developed.

So, the qualities are something which are really important, which you have to keep back of your mind while you develop a system. So, this is what I talk about at a greater length in the next lecture.