Systems Analysis and Design
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Lecture -13
Systems Analysis and Design

Last time, we started looking at feasibility analysis. So, I will do a very quick review of the points I made last time. So, that the case study I am going to discuss, there is some continuity. And you do not get last in terms of what I am talking about in the rest of this lecture.

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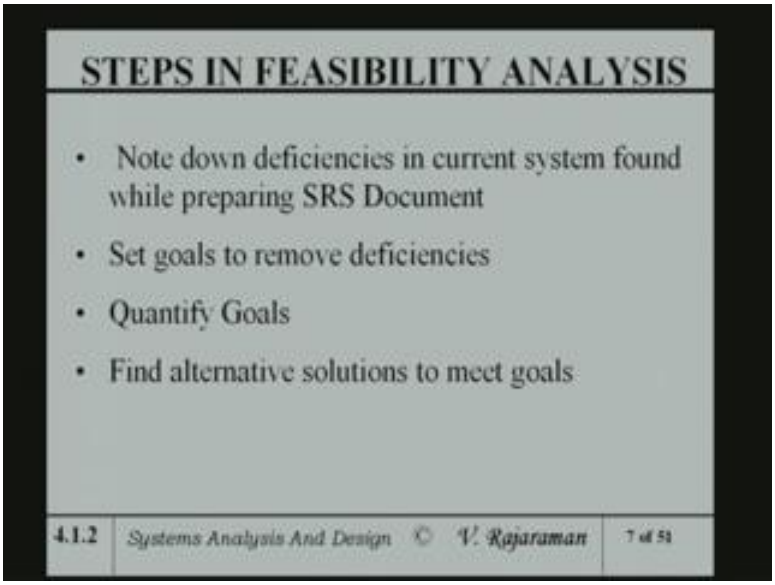

So, let us go back and look at learning of slide. We said that the steps in the feasibility analysis are to note down the deficiencies in the current system, found while finding out the SRS document. That is, while preparing the SRS document, we will find out deficiencies in the existing system.

And you have to set goals to remove these deficiencies. And these goals had to be quantify. As I pointed out, quantification means some numbers have to be there. You cannot be just saying do a better job or something like say decrease a cost. And I have to say decrease the cost by how much. And then, the goals can be met by many alternative methods.

And so we have to find out the alternative methods, in the goals. And ultimately find out the best alternate method. Best alternate method will be one, which will need all the goals at the minimal cost. And that essentially that what the alternative should be, we were in the feasibility analysis, we also have to see whether the goals which you set it is possible to meet these goals.

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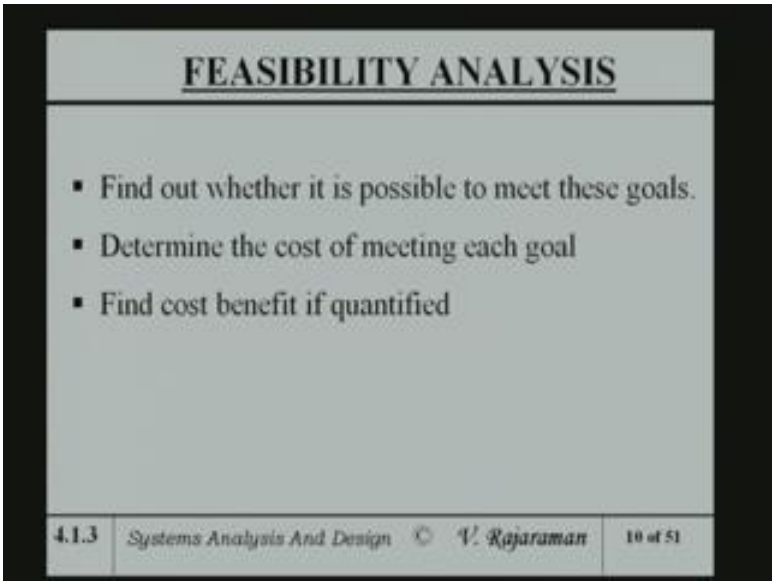

Sometimes, goals may be set which may not be able to fulfill. And you have to find out the cost of the each of these goals and cost benefit analysis. Because, one of the major purposes of the feasibility study is to come up with the cost benefit analysis, given to the management. So, that they can decide, where to go ahead with implementation the system or not.

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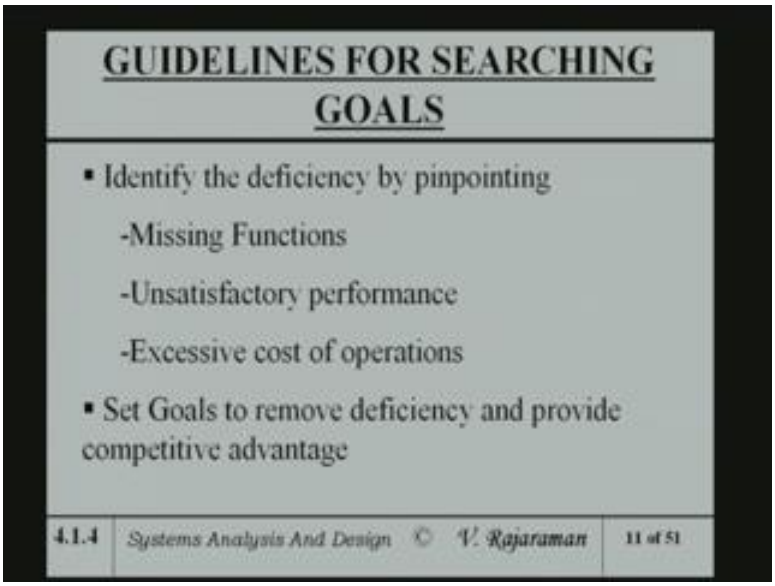

So, in terms of finding out the goals, you have to first get efficiencies in the current system, by pinpointing missing functions, unsatisfactory performance, excessive cost of operations. And we give some examples which I will give come back to later in this lecture. And goals have to be set to remove these deficiencies and provide a competitive advantage.

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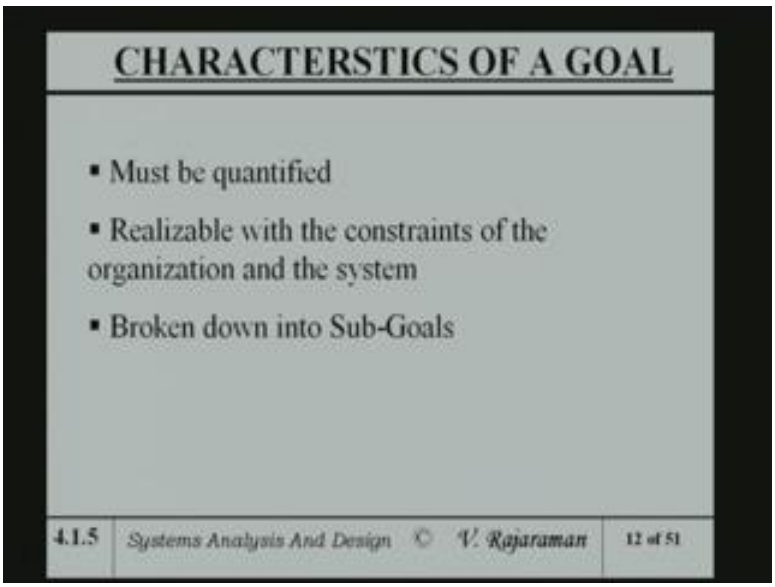

Goals as must be quantified must be realizable within the constraints of the organization and the system. And broken down to sub goals. Because, unless you break a large

problem to smaller problems, it will be difficult to tackle the problem in a systematic way.

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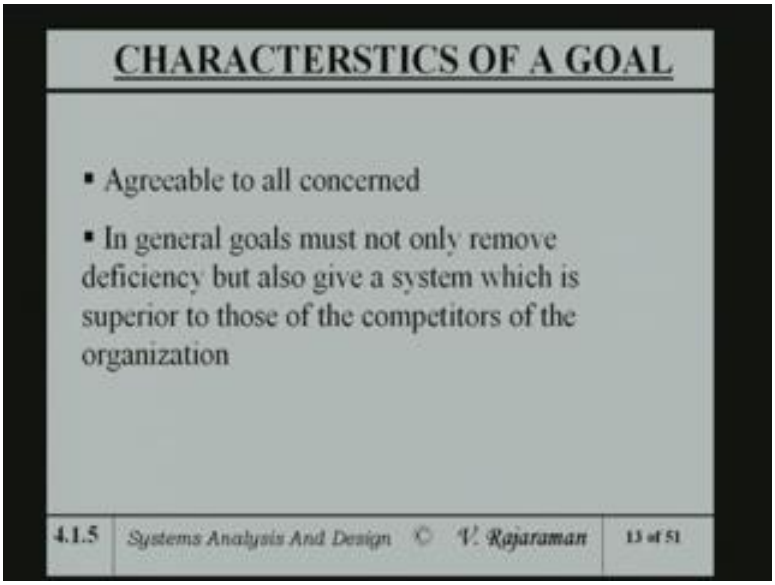

And whatever goals you set should be agreeable to all concern. That means, everybody who is involve in using the system, as well as implementing the system. And in general goals must not only remove deficiencies. But, also give a system to which superior to those of competitors of this organization.

In other words a good system would be one, which gives the competitive advantage for the company for which you have done this job. And we discussed a case study of improving the operations of a hostel mess last time.

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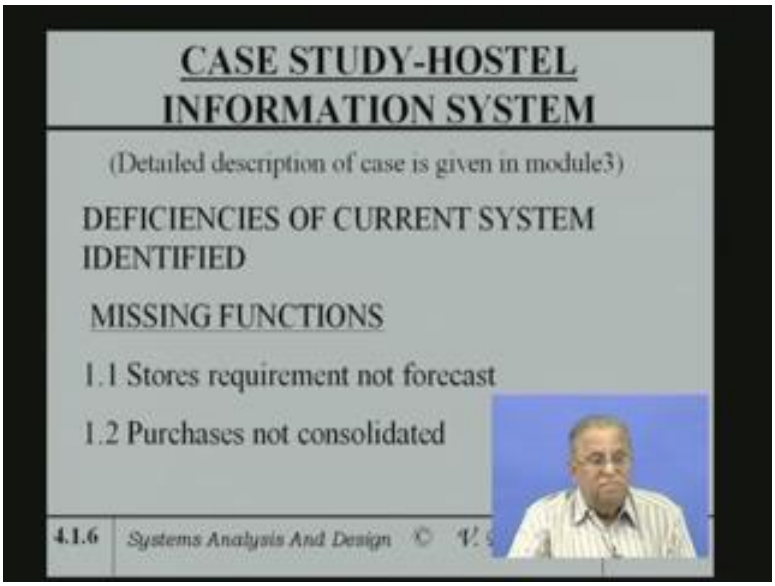

And we found out the number of deficiencies in the current system of the mess. We said the missing functions were stores requirement not forecast, purchases were not consolidated.

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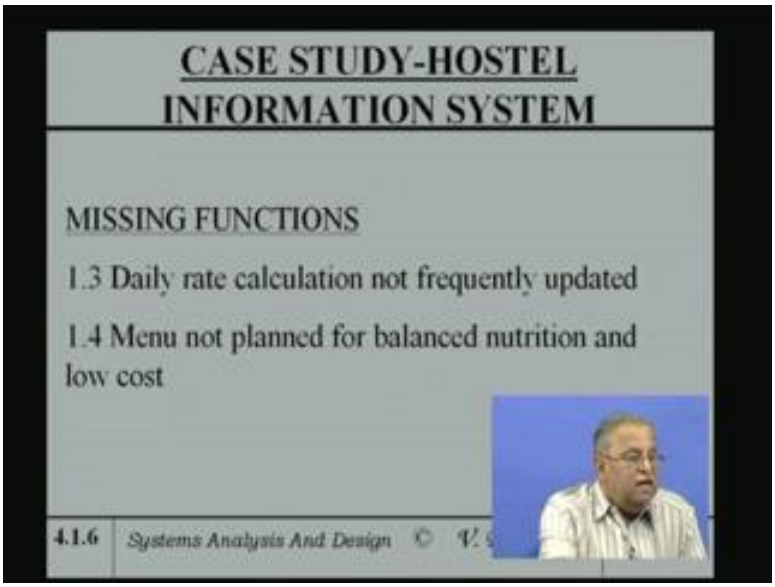

Daily rate calculation is not frequently updated, menu was not planned for balanced nutrition and cost.

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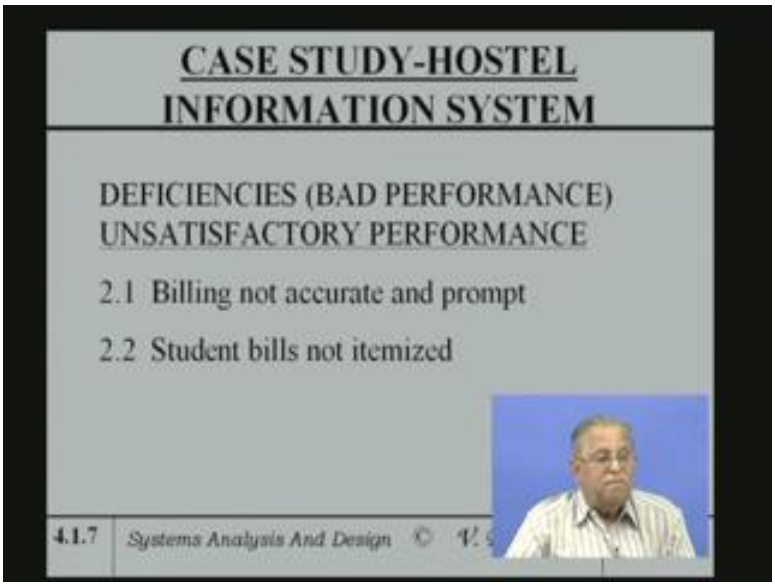

And billing was not accurate and prompt, student bills are not itemized. These are all bad performance and unsatisfactory performance.

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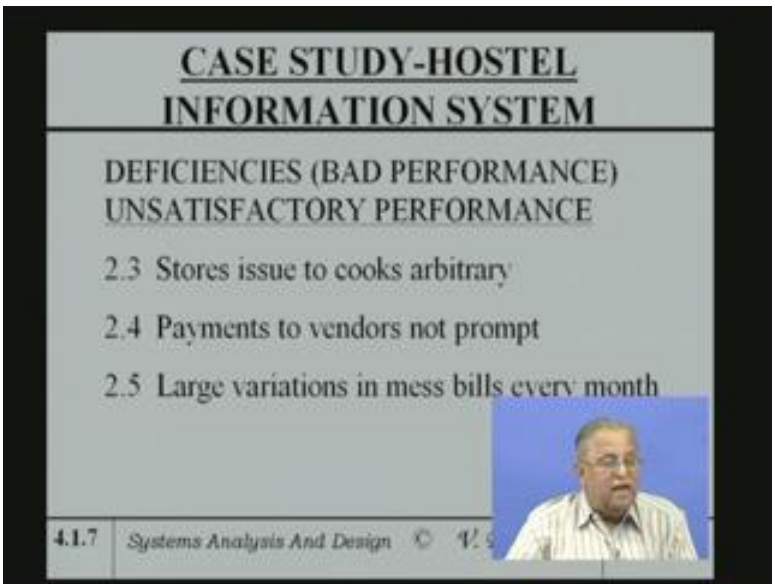

And stores issue to cooks arbitrary payments vendors is not prompt. And large variations in mess bill every month, which students do not like.

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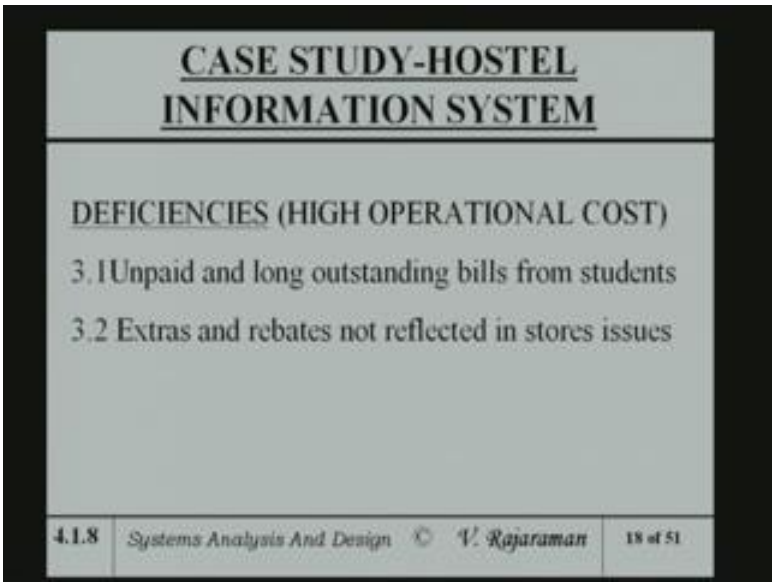

And unpaid bills from students from long which are long outstanding. If the bills are not paid in time the students. That means, there is going to be a ultimate cost or the increase in the bills of other students. Because, effectively we have to pay interest on that outstanding amount.

Extras and rebates are not reflected in the stores issues. In other word whenever a student has extras or he brings a new guest and so on. You should reflect that in terms of issue. And similarly, the students go away on leave and they are not going to use the mess, we should able to reduce the amount of stores, which is given to the cooks.

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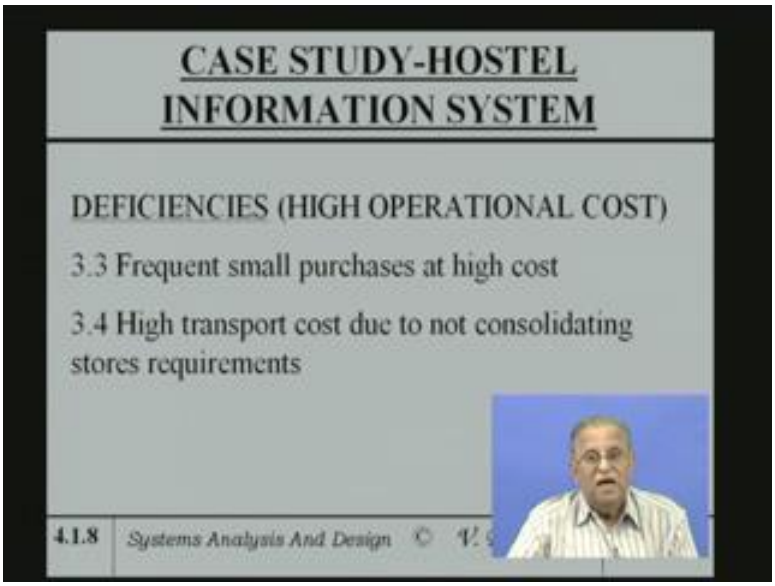

And we found that high operational cost of due to frequent small purchase of items because of not consolidating the requirements. And so the cost became high and because we buy in bulk, there is a discount. If you buy only small amount there is no discount. And high transport due to not consolidating stores requirements, we have to make several trips to the down to buy items.

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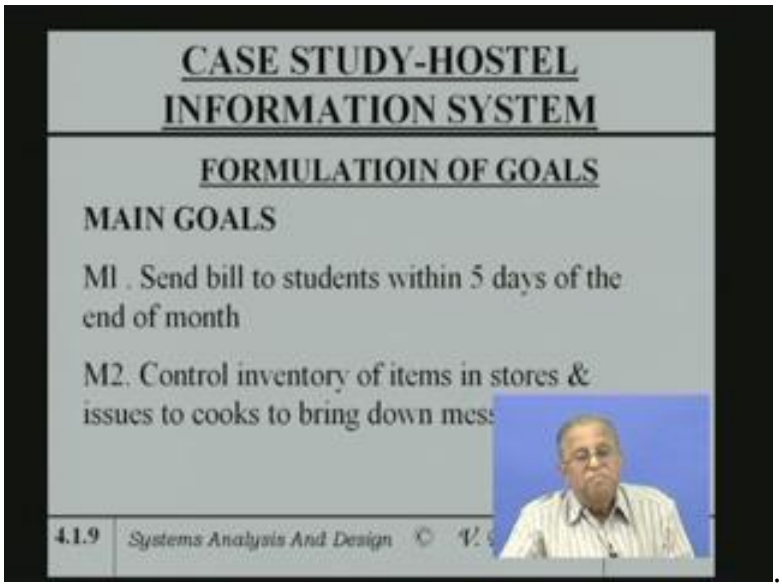

And it may bring up the cost or increase the cost. So, now the goals I have said or formulated to remove these deficiencies. And so the goals also should be quantified. So,

I am formulating the goals now to for this system, namely the system for making the mess accounting and mess issues and so on better.

And so that the overall satisfaction of students is better. By setting certain main goals of whatever system I want to implement. For ultimately, we have to meet these goals by implementing some system. And I will discuss later on, what are the possible systems which can be used to implement these goals.

Now, one of the main goals is to send bills to student, within 5 days of the end of the month. The idea again see the quantifying, it says 5 days of the end of the month. It is important to kind of say that, do not say send bills to student soon after the end of the month. Soon after is a un quantified item 5 days means, it is exactly.

That is another words 5th before the 5th of every month, you have to send the bills. The reason, you have to send the bills within 5 days is to ensure the students are given the certain amount of time to pay. And they have to pay within 10 days of receiving this bill. Something like that, some number can be specified.

And if they delay beyond that date. Then, they are essentially called up and ask for explanation or even the mess facility may be stopped. Control inventory of items in stores and issue the cooks to bring down the cost of mess bill by 10 percent is again I have quantified. That is the goal is to reduce inventory and give the correct amount in the cooks and so on.

So, that there is no wastage and which will ultimately bring down the mess bill. So, I set a goal saying that I like to bring it down by 10 percent.

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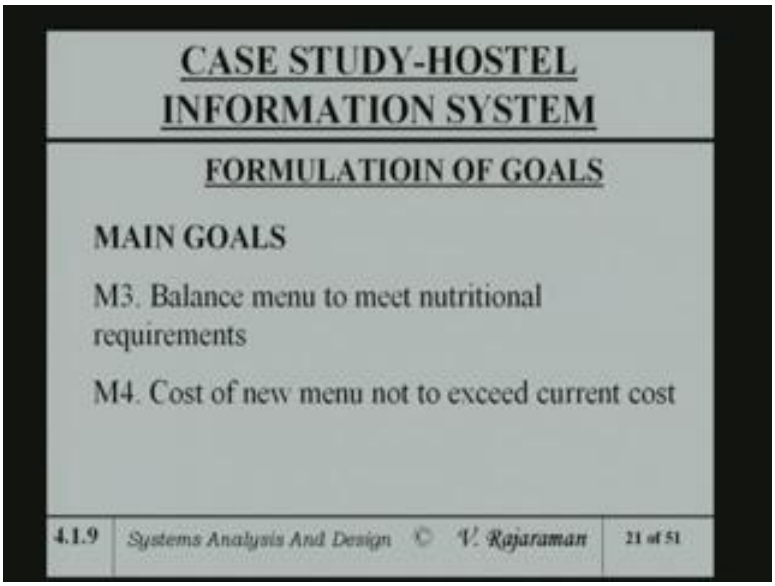

Balance menu to meet nutrition requirements. Because, this is not quantifying normal sense of I do not have number. But, balance menu really means, if you are a nutritionist to say how much of carbohydrates? How much of vitamins? How much of other proteins and so on, have to go in. So, that can in fact, the quantify and many nutritionist particularly in hospitals make a menu for this purpose.

But of course, in hostels you cannot be all that strict, in terms of the nutrition has to looked at by nutritionist. But, by in large you have to have balanced menu in the sense that. There should be certain amount of carbohydrates, certain amount of proteins things like that. And cost of the new menu must not exceed the current cost.

So, that is quantified in some sense, in sense you know the current cost. The current cost you say 50 rupees, the new menu should not cost you more than 50 rupees. In fact, we said, but it should be brought down. And that is a primary goal and itemized the bills showing extras and rebates with bills.

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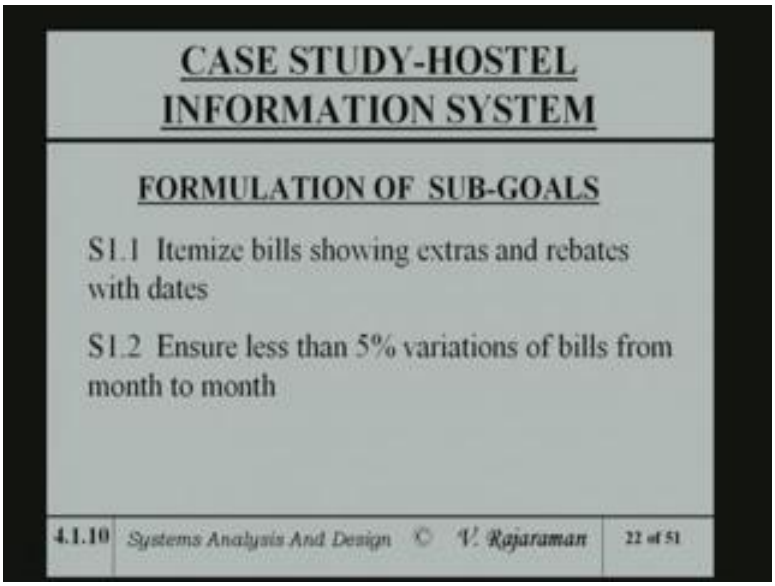

Because, that is gain one of the goals I am going to set. And I will say later on what these are going to kind of meet. In other words, let us just look at the, if you itemize the bills showing extras and rebates and dates. The deficiency in the current system namely non itemized bills and student not knowing, what they are paying for that deficiency will be removed.

And you ensure less than 5 percent variation in bills from month to month. So, that is one of deficiencies we said is that, the wide variation in the bills from month to month. For this way you could have 5 percent limit on the variations. And how you do it is also you have to consider how it is done is to be looked at in some detail.

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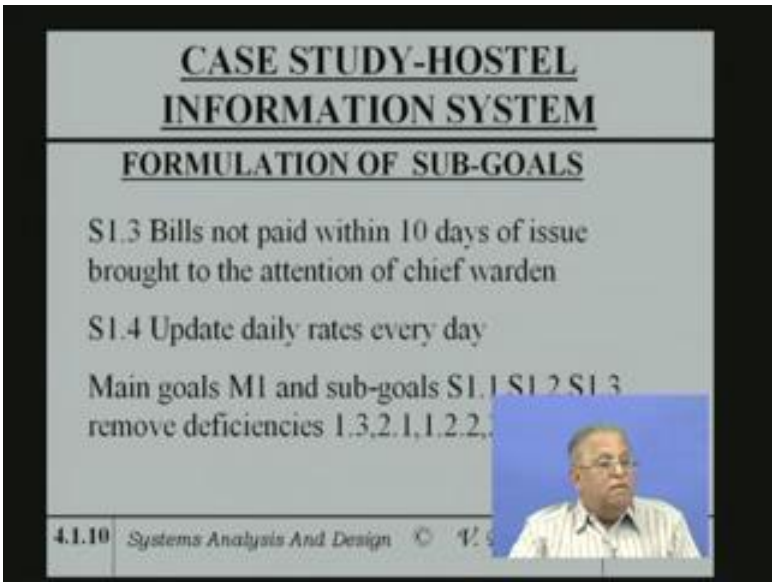

Now, the other sub goals bills not paid in 10 days of issue is brought to the attention of chief warden. As I said within 5 days of the end of the month, the student bills are issued. And if it is not paid within 10 days, you bring it to the attention of chief warden, you update daily rate every day. So, that effectively what it really means is that, the variations in the mess bill will be reduced. If you look at the main goal m 1.

The main goal first source requirement was not frequently updated. And the sub goals were in terms of the removal of ((Refer Time: 14:24)) not itemizing bills. And the variations in the bill and so on. So, I will not go back the transparencies, because the fact that we can actually look back and look at them. But, I will explain what each of them is actually meeting.

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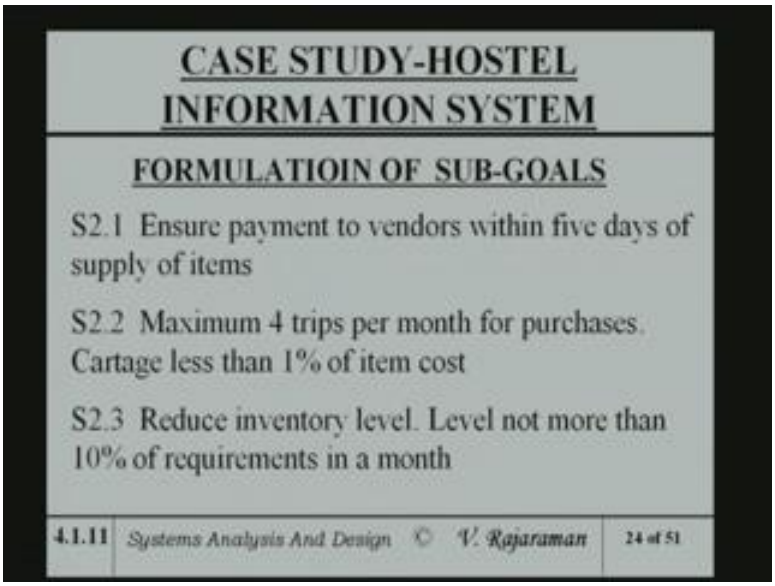

Ensure payment to vendors are within 5 days of supply of items. Now, the whole idea of ensuring payment to vendors within 5 days of the supply of the items is it will meet the goal of bringing down the mess bill from existing value. So, if you are prompt in paying to the vendors. The vendors will also reduce their cost to you. And the reduce the cost of you ultimately it is going to reflect in the mess bill.

So, the idea is to gain you quantified say within 5 days of the supply items. I am going to pay him. And if you sure that within 5 days of this items, we issued is to get the money. Then, he will be quite amendable to give you better rates. And you reduce the trips per month for purchases to for and cartage less than 1 percent of item cost.

So, the whole idea is that if you consolidate all your requirements. And have a very clear inventory control system, then you can reduce the number of trips to the city and that will be bring down the requirement for the what I mean by cartage is the transport requirement, transport cost, transporting items.

And reduce inventory level, level not more than 10 percent of requirement in a month. So, this is a gain is quantified here existing inventory level, reduce it at bring down to not more than 10 percent of the requirements.

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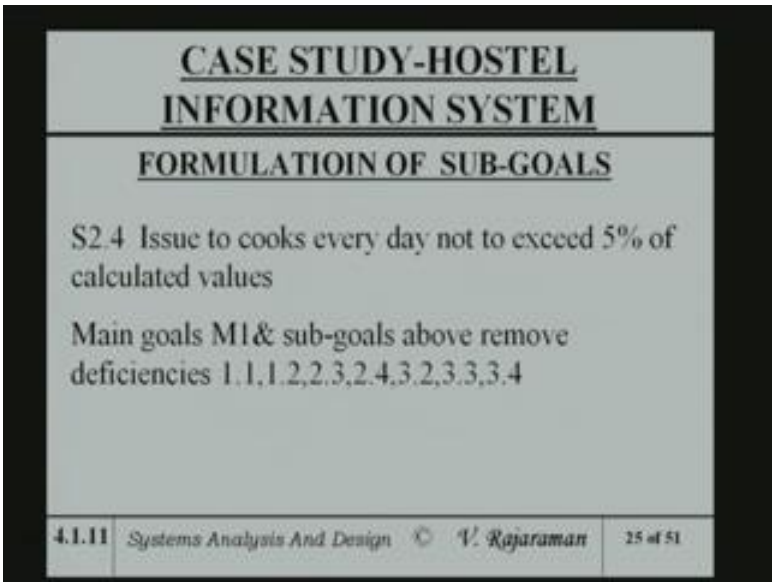

Issue to cook every day, not exceeding 5 percent of the values. So, all these main goals and sub goals or effectively to remove the deficiencies, which have been stated earlier. So, go back and look at all these deficiencies and I stated them here. But, as I exercise and just review, we go back and look at them. And convince yourself, what I have said in terms of the removal of deficiencies. Numbers are given there, you can go back and look at those numbers and see if it is alright.

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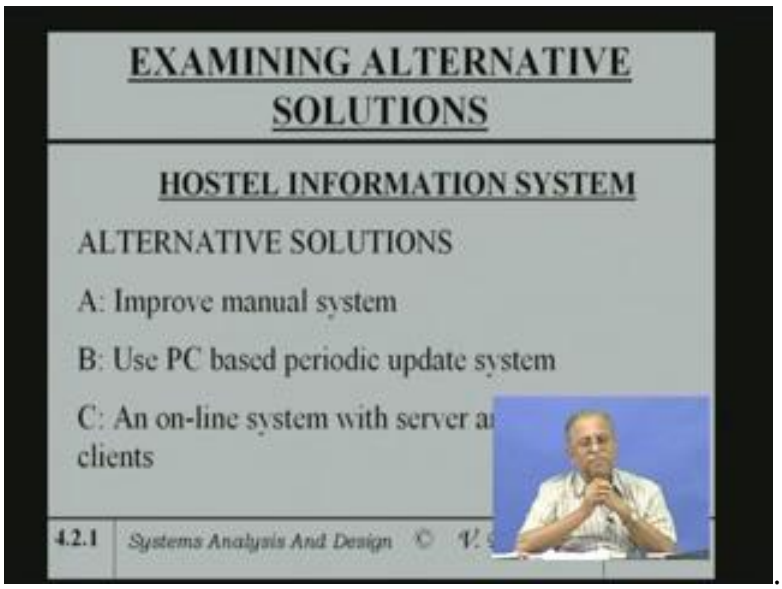

So, now we have come to a stage, where we have set certain main goals, quantified main goals and certain sub goals. And whatever system you want to implement now has to meet all these main goals and sub goals. So, at the end of the implementation time, one would judge the efficacy of your system by comparing, what you promised with what you achieved.

So, it is very important for you at this time, when you formulate the goals. And the sub goals, that whatever goals and sub goals, you are proposing or achievable do not promise the moon. Other words, if you say I am going to bring down the mess bill by 25 percent and still give balanced menu, it may not be feasible at all.

Because, I said one of the things about of feasibility is that the goals should be realistic within the operational constraints. And within the other constrains of operational in system. So, you have to be somewhat conservative in setting your goals. If you say that I will bring down the mess bill by 5 percent and we bring it down by 10 percent everybody is happy.

If you bring it down by 2 percent or there is no change everybody is un happy. So, the whole point is that it is better to be conservative and not be too optimistic. One of the problems with many of the smaller software vendors, who develop software for companies, is to go and promise certain things, which are not achievable.

Within the time constrain, within the kind of capacity or whatever constrains or operational, both physical and time constrain. And that creates certain kind of a what I would say predictability gap on computerization. On this predictability gap has to go. So, one should be able as I said to meet whatever on promises, this is very important.

Now, once you come up with all these goals and sub goals, which are achievable within the constraints. Now, the next tab is to see how you can implement it. One always assumes particularly in course like this, where we really talking about computer bill systems, that one has to use a computer always.

It is not always true, sometimes for smaller situations. The feasibility analysis and goals, which you set at the end of the feasibility analysis, can be met by improving the existing manual system or implementing some new manual systems. So, do not assume that the system is going to always based on the computer.

And then, large it terms out that many systems which are implemented have computerized, other important component of the system. And even then no system is entirely automatic. In the sense that, it uses it requires people to operate them also people to use them effectively. So, all system ultimately will be combination of certain type, certain number of manual operation, which you do, combined with the certain number of computer based operations or what operations computer does.

Let me give an example of what I mean by this, we looked at the system, where number of items coming in to a supply by vendor to a company. And then, the items are inspected and take it into store. In this case obliviously, the inspection process inspecting the items is a manual process. But, at the end of the manual process, the inspector or inspectors who did this job is that winding out in a document, may actually enter in to an a keyboard, which is again a manual process.

So, the inspection process is manual, the data entry is manual. So, it is not as so the whole system is automated. And so one has to keep in mind, that all real life systems will have humans, as an integral parts. And certain procedures, which humans have to follow will become important parts of any system which you implement. So, there is need for also procedures, which are easy for people to follow.

So, that is one thing we have to always keep in mind when desiring a system. And people as you know have their own drawbacks. In other words of their own the probability of person making error, in key in some data is not zero. There is a definitely a finite probability, that some wrong number will be entered. Because, the manual process one also of course, tries to see some of the manual things, which are routine, clerical can be automated. But, not everything can be automated.

Ultimately, people are important. And also keep in mind, the people have certain characteristics and people are not automated on it, they will become tired, they will make errors and thing is like that. So, all that is got to be kept in mind, while desiring a system. So, in this case for the hostel or mess management system, not the hostel management system. As I pointed out at the very beginning, we are only going to look at the improvement of the mess.

Because, the wardens said that give other aspects of hostel namely room allotment and things like that, are not all that critical at this time. And whatever they are currently

doing is going on smoothly. And only thing were there finding at somewhat unsatisfactory is the area of billing for the mess.

That is, where the daily rate variations are wide and generally stores for un happy. So, at the end of the fact gathering stage with the wardens, we found out the mess management system is the one which got to be improve. So, there are three alternative solution, which you look at. One is to improve the manual system, the existing manual system and can you improve the manual system.

And or use a PC based periodic update system, in other words use a PC which will do the calculation and data entry and so on, which is done there. And it will be along with the people there, it is not be automated obliviously. And the third possible solution, it is a on line system with server, with several slides. What I mean by this, if it is a use a PC based system means, that in the main mess office, where the mess in charge, who normally will be a clerical person will be given some instructions and forms to enter.

And based on the entry on to that PC. And the program which will run the PC. Whatever, goals I have set in the feasibility analysis will be met? So, in this case there will be only one PC in the main office. And that will effectively be sufficient for doing the type of job, we want to be done. The other possibility, we will look at online system means that there is a network is more than one computer.

Then, the certain terminals or PC is connected to network and a server, which does all the calculation. So, these are three possible solutions. Let us look at one by one; what the advantage and disadvantages are and weather they are feasible in terms of meeting our main goals and sub goals.

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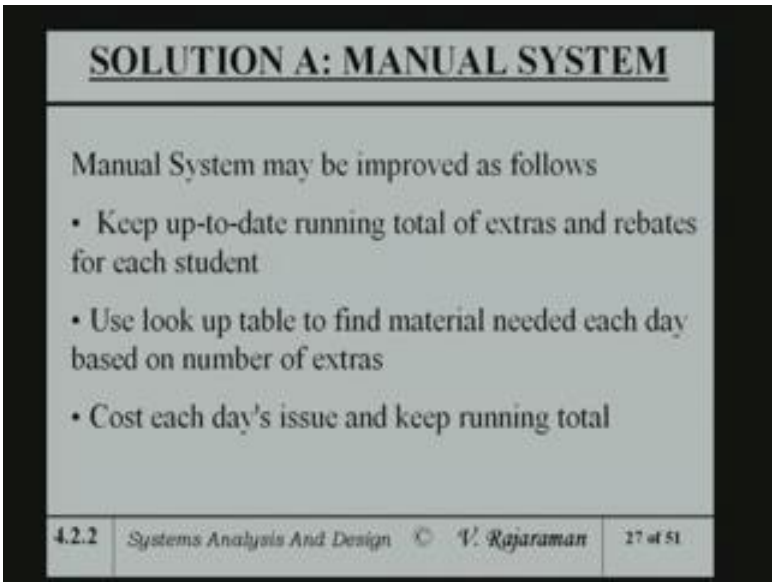

Manual system may be improved as follows keep up to date running total of extras and rebates of an each student. In other words, the you keep a register in the mess, where he eats. And whenever he takes extra rebate, it is entered there by the mess supervisor. And at the end of the day, you have a clear idea. How much extras are there? And what kind of and how many student did not come and so on.

So, in other words you can systemize the manual system by requesting that the requiring. That the students inform you, at least 3, 4 days ahead of time some dates can be set. If they are go into not here in the mess for a few days. And exact number days you are not going to give. So, that if you note down, that will help in controlling the inventory or items being issued to the cooks in the mess. And buying vegetables, milk and stuff like that.

So, there is up to date running total extras and rebates. Use a look up table to find materials needed each day based on the number of extras. In other words, you keep a clear you might it just a table saying that, if these many students are there, these are the menu, these are items we issue. And based on that you issue the items to the cooks.

So, it is kind of that table is decided by consulting with the cooks, what they require. And of course, the mess supervisor is supposed to be in a know of things, in terms of how much is to be issued and so on. Of course, he will have lot of experience of having messes in the past. Cost each days issue and keep running total.

The whole idea of keeping or running total after costing, what is issued is there? Is if from that you can actually find out the daily rate. And the daily rate variation can be controlled. Suppose, you are a certain issue of particular date cost of certain issue is 5000 rupees on a particular day. And next day it become 8000 rupees.

That means, there is strong variation. So; that means, either you had a more expensive items or that you have too many people. But, you can correlate it with the number of people and so on.

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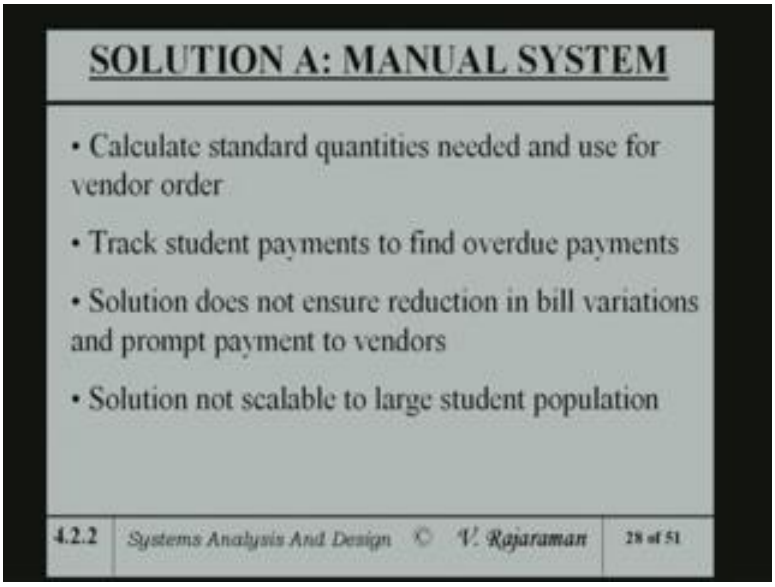

Calculate standard quantities needed and use it for vendor order. And other words for the actual month, you can calculate based on the average number of students who are there. In fact, you can actually do a statistical calculation says that, you look at the past 2, 3 months. And find out the average based on that. And based on the average number of meals cook every day.

And different meals ((Refer Time: 32:49)) breakfast, lunch and so on. You can decide, what items are require? How much quantities required and so on. And that can be used for the vendor order. Track student to find out overdue payments, that is again that is manual. See, solution does not entirely ensure reduction in bill variations and prompt payment to vendors.

Because, it only says what order to give the vendors. Solution is not scalable, that is the whole problem. Otherwise, it may be alright you got a mess of 50 students. Like in a home you got a small number of people and you do not really go through all this business. And if it is a small mess with 50 students. So, manual process will work reasonably effective.

But, if the number of students increase to 500 or 1000 and so on. Then, the manual process will break down in the sense that, the variation will be too much. And it calculation time will be too much. And it will not very easy today computerization properly.

So, point I am trying to make is the advantage of a computer comes out much more clearly, when the volumes increase. When the volumes are low, very often it is found manual method is would not enough. Let me tell an simple example, if you have a class of 30 students and you are giving the test and so on grading yet.

And at then to the term you have to find out the grade for 30 students. And find out which class each student is n, is much easier to kind of sit down and do that manually. But, we have lot of students write an big examination it is humanly not possible like too long at time.

So, one has to look at situation is where, it is worth while writing all this programs. And doing all this work and general rule of term is the process is going to be for high volume. And it is going to repetitive, it is going to repeat again and again month after month, month after month, month. Then the cost of writing a programs, creating a system and so on will be amortized.

That means, it will be average doubt over the lifetime, which you are going to use it. So, the point is that, it is not worth computerizing anything, unless it is going to be repetitive going to use again and again, again and again, again and again, many times. Some more times you use it the less is the average cost. And the more is the volume, you are going to deal with the more essential the machine becomes.

And that is one point you have to always keep in mind at the back view of mind. And it is not necessary to plunge ahead and use a computer to every case. If it is a small kind of

a thing, it may be quite sufficient to do it manually. May be I am little old fashion, because now a days for everything people just go to a PC or laptop do things.

But, I am really talking about real systems, real systems and real life, where it is a important to keep in mind a fact that repetitive use where which is going to pay off in the long run.

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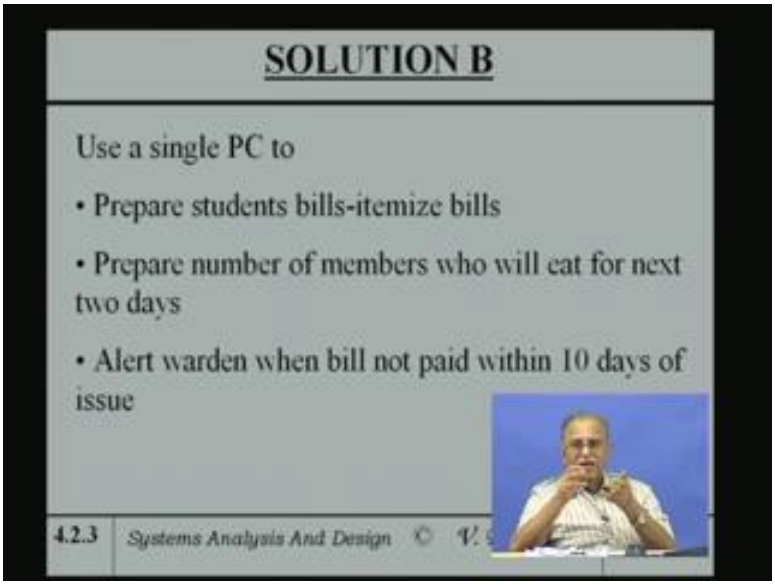

Solution B is single PC prepare student bills and itemize bills. See bill preparation is a automated process, if you write a small program. And you can nicely print out and give a nice printout to the students. And you can itemize the bills, where as in manual process to itemize each bill in terms of extra ((Refer Time: 37:45)) and so on. It will take a long time as a number of students increase, the itemization become impractical.

Whereas, in a machine that is 500 students or 5000 student does not really matter. The machine is going to take slightly longer. Prepare number of members who will eat for the next 2 days. That is based on the information, which is to provide about student about weather is going to use the mess or not use the mess, weather he is going to bring guest or not.

So, these things you are expect to give students certain amount of notice. So, in this case I am assuming that notice given for at least 3 days ahead of time. But, it is going 3 days ahead of time. Then, for next 2 days you can calculate by the number of members. And

based on that, you can find out the inventory requirement. That also can be done by computer program.

Otherwise warden bill is not paid in 10 days of issue. In other words, you when a bill is actually issued 5 days from the end of the month. And as soon s the payment has been made, that is enter in the PC. And date due and the date on which are paid is compared, if 10 days after the date due students are not paid, that exception list that is called can be prepared by the machine. Because, all this stored in the machine and that list can be sent to the warden for action.

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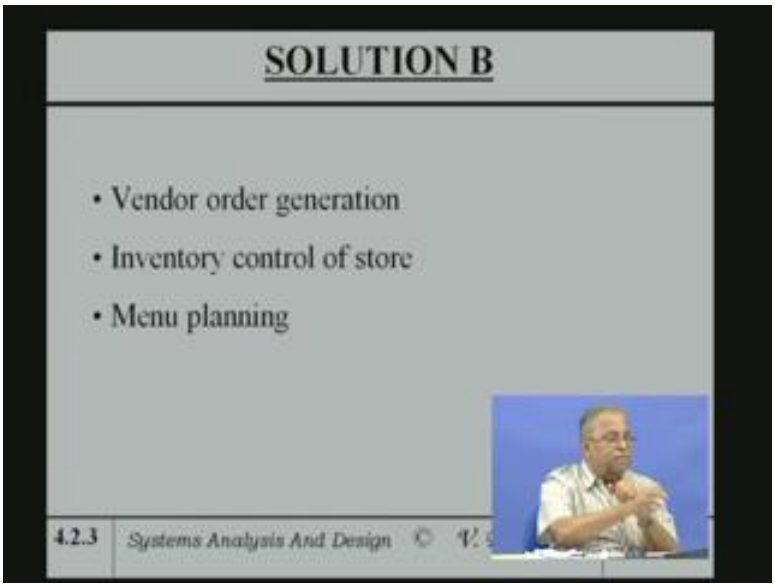

You can create vendor order generation. That is based on the items to be purchased, you can create an order for the vendor. And you can control the inventory of the store and you can also do a menu planning with a computer program. That it is very interesting kind of a problem of menu planning with the computer.

In fact, I knew a particular mess, where they did a menu planning of very effectively. Because, again menu planning as I said, we had to meet certain nutrition requirements. And you also have to keep some variety in mind, you also have to see to it that the same menu is not repeated every day. And you have to kind of randomized the way and which menus are prepared.

So, that one cannot predict every Monday you will get certain things, every Tuesday you will get something else. So, it is some amount of randomization and a good plan of menu system meeting these constraints, they also try to use the vegetables, which are available which are seasonal and which are also not very high cost.

So, you can make some kind of a menu based on available vegetables and so on. And try to reduce the cost at the same time balance the menu. In fact, I do not know if I said case where they actually did it. And use very interesting operating system technique to do this in terms of... Because, operation as techniques as you know are the ones which you use set of requirements is a certain constraints.

In this case requirements will be to meet certain nutritional requirements. And constrain will be the cost of the work, what will you get ultimately. So, this small interesting kind of a application of operation of requirement. Operation search has been made in menu planning. And, if you do a clever job of doing that, you will essentially get. You, will get the respective of students also we are doing it yourself.

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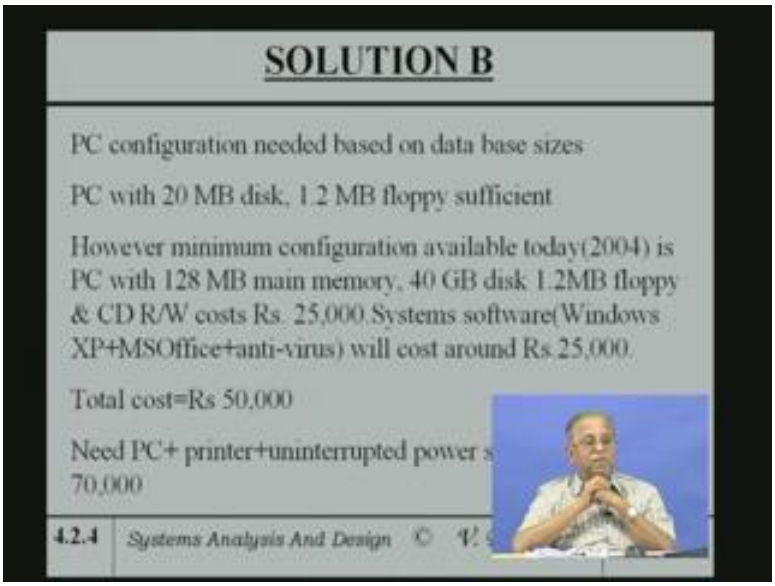

Now, the PC configuration needed is based on data base sizes, in this case we are talking about 500 students. The data base is not going to be very large. And in fact, you may work with 20 MB disk and 1.2 MB floppy would be sufficient. But, now a day's of course, you want to buy a 20 MB disk it just not available. The minimum basic configuration, you can buy will have at least 40GB disk. And 128MB main memory.

And, year after year as you know this numbers also increase from 40 GB, next year it will become 80 GB as a standard and 128 MB may become 256 MB. Because, the cost is coming down, it will increase memory sizes and increase in speeds and so on. And in fact, floppy is going out to more or less fraction. You get all these flash memories, which are replaced in the floppies. And even though, that is the case floppy memories are still available.

And CD rewrites which are standard, which are required to lowered your programs and keep backups ((Refer Time: 44:00)) and so on. So, sometime it turns out, that you are sizing of a computer may be conservative, that sizing will may not be available. In other words, what is available something which is much higher, much bigger that is what you want to really require, but you know choice. You have to buy, whatever is available.

From whatever is available. You can of course, buy the which meets the requirements and which is the cheapest. And, I am estimating the cost of such a system is 25,000 rupees. And as I said, these numbers are not sacred. Today I am 25,000 rupees, if we are doing it 3 years from today, you may say the same thing cost 15,000 rupees, all the time price are reducing. But, is not always true in some sense.

Because, configuration increase to make the cost same. So, the cost remain same, but your configuration, you get more, more and more powerful machines for the same cost. And you need a map reading system, I am assuming windows XP and MSOffice plus anti-virus these are all essential software. One might say, why not use the an open source like Linux and open office. And some open source antivirus it is also feasible. But, buy in large turns out that people are comfortable with the Microsoft type systems.

And, you can find many more people, who know how to operate it with that system. Weather it is good or bad I am not giving any value, value judgment on this. And this, extra software will cost you approximately 25,000. And, I am assuming that you buy it for the market. And even though, some vendors see they will preload, it preloading may not be legal copy. If you are buying it for a hostel or a company, it is always a good idea to buy legal version.

Because, legal version gives you the assurance of updates assurance of support and so on. And, so it is important to have official or versions, which you buy from the market. And it is not a good idea to say pirating. Pirating is similar to stealing. And, the stringing

loss against stealing software. So, it is very important to keep in mind, that whatever software you use any implementation for any company and so on, so all will legal. So, I am assuming the total cost about 50,000 rupees.

For this PC and software and so on give it a printer to print out the bills and so on. And, you may decide on a dot matrix printer. Because ,you do not really require graphics and stuff like that, dot matrix printer the advantage of buying dot matrix printer is that the cost of supplies is there. You know the printer like an inkjet printer, gives you nice outputs and so on. But, the refill for the ink is too expensive, very expensive. In fact, they make more money on the refills.

Not on the inkjet printer whereas, in the case of a dot matrix lot more rugged. it will run for years. The original cost will be slightly higher, but we are running cost much lower, in terms of the fact that you have a only ribbon has to be replaced. So, in any situation, you have to create a lot of bills and so on. And, give it to students or in any situation, where you have to create a inventory list and vendor indene and so on. It is good idea to use a dot matrix printer rather than the inkjet printer.

And you of course, use an uninterrupted power supply. Because, power as you know is endemically is a problem in terms of failure of power. And you cannot afford to have failed power, particularly in a system which you are going to be dependent on.

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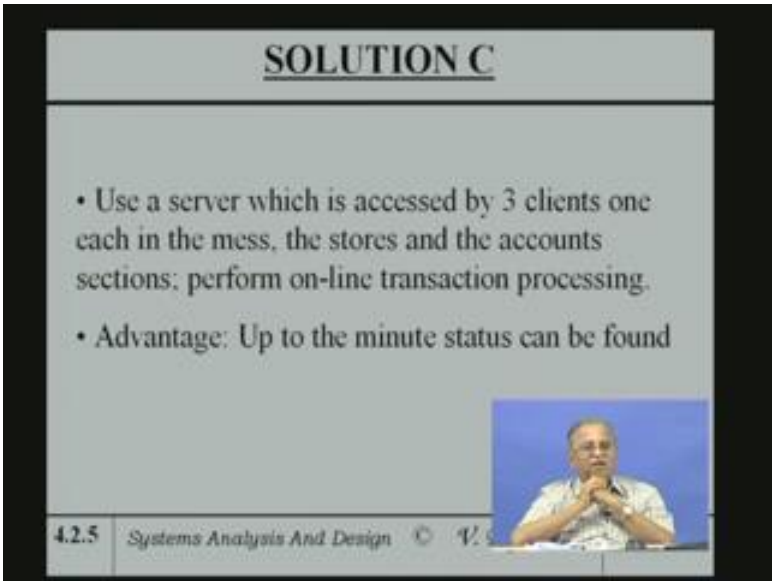

Solution C is a server, which is accessed by three clients. One each in the mess and the stores and the account section. The advantage of this is that, in the mess the mess supervisor enter as soon as students take some extras and so on. And at the end of the day, you have a up to date value of the number of students, who ate in the mess that day. And what extras are given and so on. And the stores also, as soon as the stores issue you can note down and it updates the stores online.

The accounts will continuously update the bills to pay it. And bills to be paid and so on. And so there will be a, you might say up to date pictures of what is happening everywhere. So, up to the minutes status can be found. But, it is not essential in this case. Because, you are going to prepare the mess bill only at the end of the month once. And so having everything up to date is not essential. Once a day, at the end of the day I am able to find out.

How much items have to be issued to the store in the next day. And 2, 3 days I know how much, how many students will be eating and so on, that is sufficient. So, up to minute is not required ever the time constant in this case. In the interval you need to take decision is something order of a day. So, you really do not require a an online system, which does the immediate update and stuff like that.

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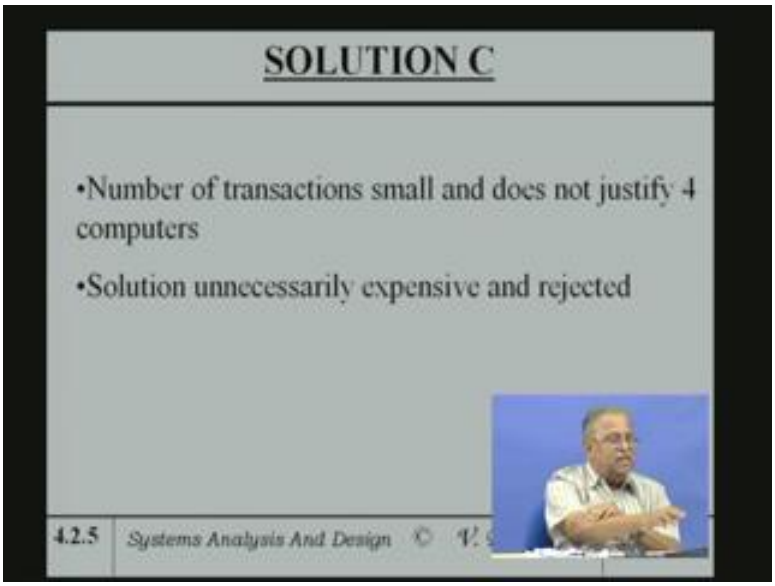

Further the solution C as I said number of transactions small. and does not justify 4 computers. And solution unnecessarily expensive and not necessary and so we reject it.

So, solution a has rejected, because of the fact that the manual system is not feasible, when the number of students increase. And this case this 500 students, next year it may be 800 students.

And so there is no point having a system, which cannot be upgraded with the passage of time. So, solution C is rejected because it is expensive. So, it takes solution B, which is sufficient for the particular purpose and it will meet our goals and sub goals. And meeting of sub goals and goals is based on the programs you are going to write, which are going to ultimately meet the goals and sub goals.

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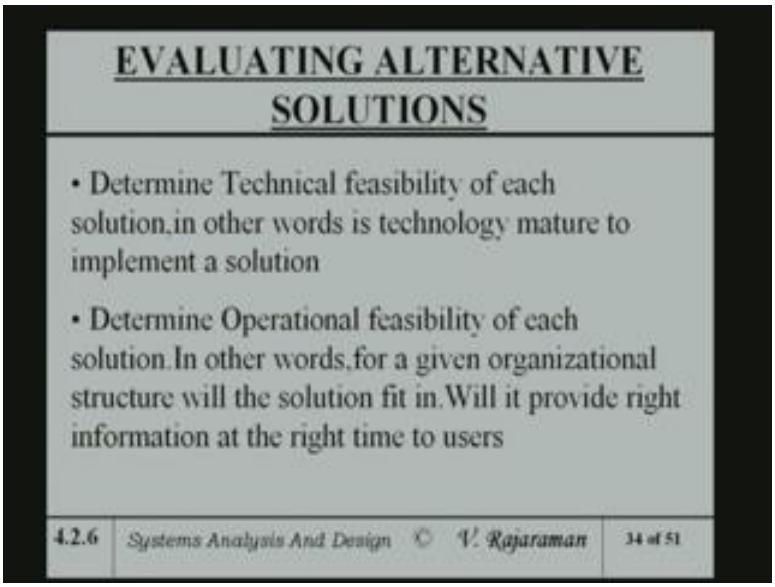

Now, if you evaluate the ultimate solution, determining the technical solution of each solution. Other words is technology is mature to implement a solution. And determine operational feasibility. Now, in other words for a given organizational structure will the solution be possible can you will it fit in, will it provide right information at the right time to users. This is the operational feasibility and economic feasibility.

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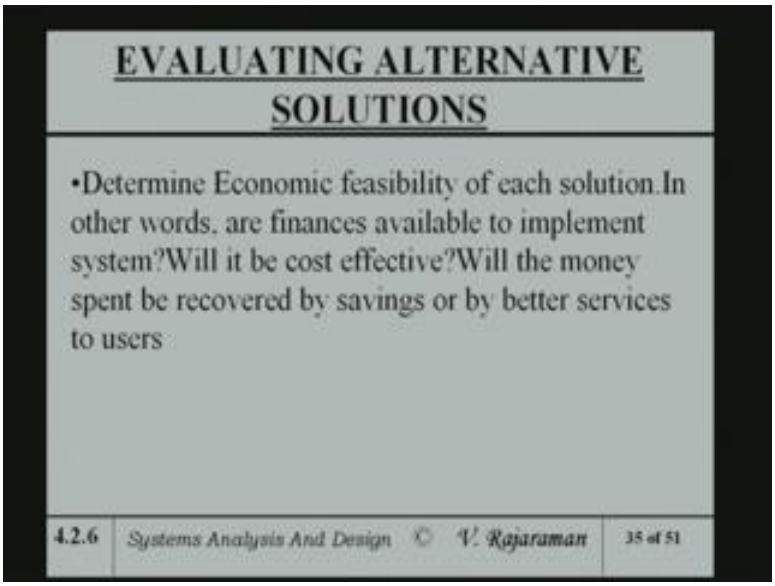

There is a weather will it be cost effective, will the money spent by recovered by savings or by better services to users. So, the three kind of things I said, one is technical feasibility, operational feasibility and economic feasibility.

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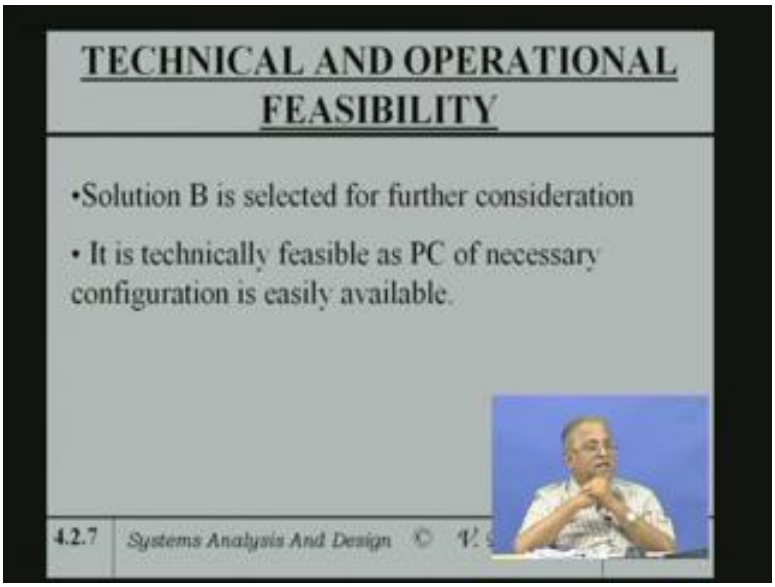

Solution B is a vector selected for further consideration. Because, technically it is feasible PC can be bought. But, the point is that, ultimately the PC has to enter items has to enter there and so on is to be done by a clerk. So, question which may arise is it

operationally feasible, it will operationally feasible provided the clerk is given enough training in terms of how to enter? How to correctly enter and so on.

So, you do not the clerk does not have to enter no programming and stuff like that. He only has to have a clear understanding and education on proper data entry, without making any errors. But, as I pointed out you cannot assume the everything will be enter without errors, there will be errors.

So, you got your program has to take care of that fact, that there will be errors. And the errors will be detected by the program. Data entry at the time of there will be checked by a program. And the program will throw out in correct entries and so on. Later on in this course you are going to talk about methods of ensuring, that enter data is reasonable and it is not incorrect.

And those are important which we will discuss later on. So, the operational feasible if says that I can train the clerk to do it, to enter the data and so on. And it is technically feasible, because PC are easily available.

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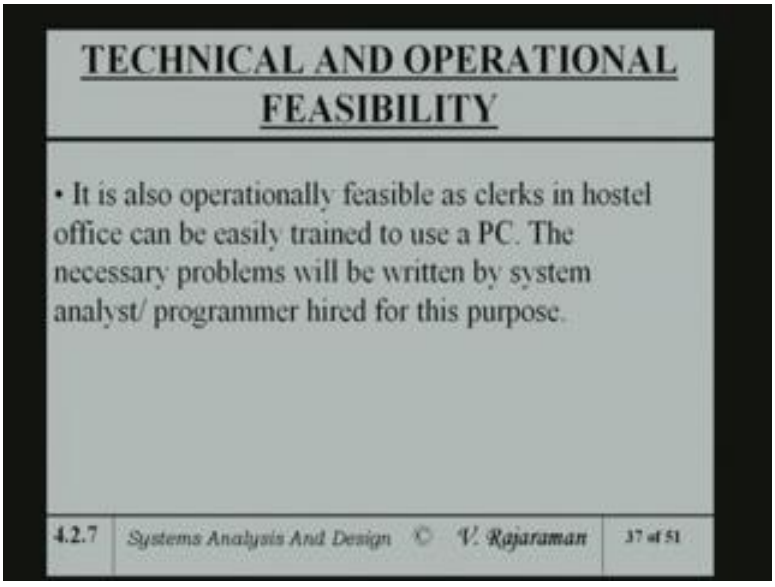

So, economic feasibility has to be essentially found out. So, it says operational feasible, because clerks in hostel office can be easily trained to use a PC. And necessary problem will be written by system analyst programmer, hired for this purpose. In other words, the clerk only enter the data, the programs are you written to meet the goals and so on.

And the programs are written by programmers and analyst he may hire for the purpose. Some places they try to use students themselves to do that. And there are good well educated students who know programming fairly well it may be done. But, by in large turns out that students are of floating population.

They will be here for in the college for a few years by the time they divert this program, then may be in the third year or fourth year. And they are going to leave. And because, that is their part time hobby kind of a thing, they may not really documented very effectively or correctly. And there is no responsibility later on to keep it going.

So, it is a good idea to essentially hire a professional help, from may be a company. And that company will be held responsible to maintain or continuously update as a requirement change from here to here to here. So, the point I am going to make is that, you had hired an analyst and the programmer from accompany to kind of get this first of all design the system.

The analyst design the system, as I said it is a architectural system. And the program is going to implement the program for which is there.

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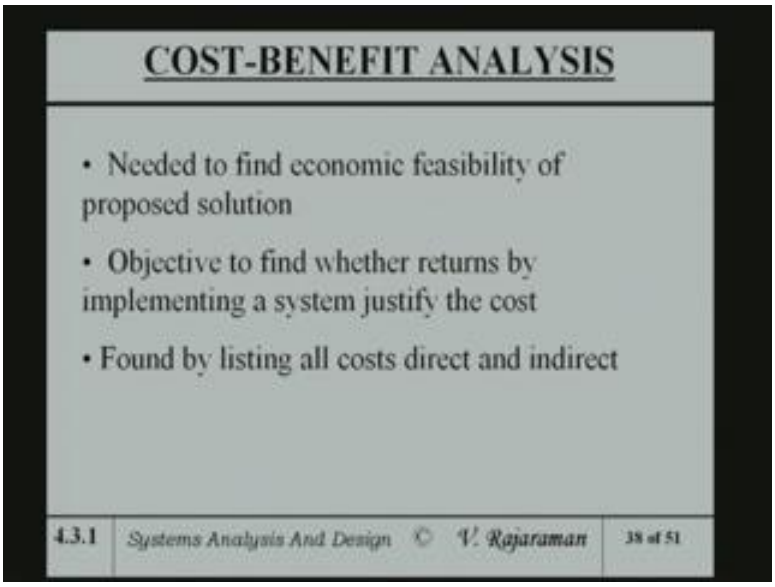

So, needed to find economic feasibility of the proposed solution. What is meant by economic feasibility is find weather returns by implementing a system, justify the cost

benefit analysis. And found a listing all cost direct or indirect and then, computing the benefits also.

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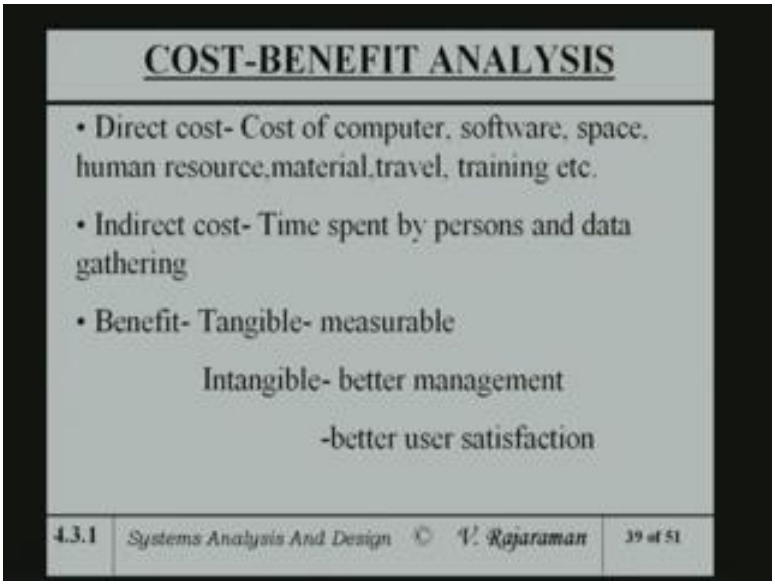

In this case, direct cost is the cost of computer, software, space, human resource, material, travel, training etcetera. Because, in our particular case example, there is no question about space cost of space. Because, it is hostel office where already there is a clerk and may be the type writer is removed and PC has put.

But, space become important in many companies which are situated in right in the middle of place like Mumbai, where the cost of 100 square feet of area, may be even more than the cost of person, salary the person. So, space cost because is important in such situation.

And human resource cost of course, in this case is important whatever you are going to pay. Materials ((Refer Time: 58:51)) consumable going to consume. And travel in this case no travel, training is the training of the clerk, in this case it may not be very high. So, point out direct cost involve the these things, indirect cost time spend by persons data gathering and so on.

And the benefits are both tangible and intangible. Tangible is measurable, so I am rupees I am saved. Intangible means, I have better management, but you have to use a

satisfaction and so on. So, in this example here taken, we will look at both the tangible benefits and intangible benefits.

And we also will find out a total cost, we only found out the computer cost, there is the capital expense. We also have to find out the running expense, month after month, how much are going to spend. So, next time we will look at the cost benefit analysis by adding up all the cost. And finding out the benefits and find out methods of quantifying the cost benefit analysis.

Thank you.