User-Centric Computing for Human-Computer Interaction
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Lecture – 08
Case Study (web site design)

Hello and welcome to the 8 th lecture in the course User-Centric Computing for Human-Computer Interaction. So, far what we have discussed are related to the interactive software development lifecycle and few of its stages. So, repeatedly we are saying that this lifecycle is meant for building user centric systems. So, it actually tries to emulate the user centric design approach with the use of the iterations that are part of the lifecycle.

Now, today we will discuss one Case Study to illustrate what happens when we do not follow such lifecycle or when we are not following the general principles and guidelines of user centric design.

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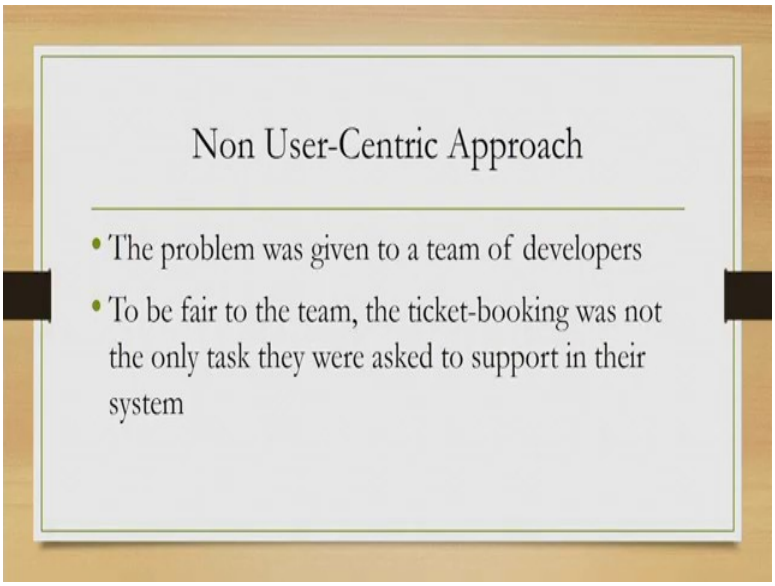

So, the case in question is basically development of a web page for a railway ticket reservation system. A traveler wants to book a railway ticket so, he wants an interface for that. Now, here are two things you should note, first of all the traveler is more likely to be a non technology expert. In fact, that is what we should expect non-technology expert or a novice or intermittent or expert, but not in the technology that propels the system.

So, in that case the usability concerns are of course, very relevant; so, we have to develop a system which is usable to such users. Now, let us hypothetically assume that the problem was given to a team of developers and they were asked to build the system. They were also told that ticket booking task is the main thing, but along with that they were told that there are other things that they have to support.

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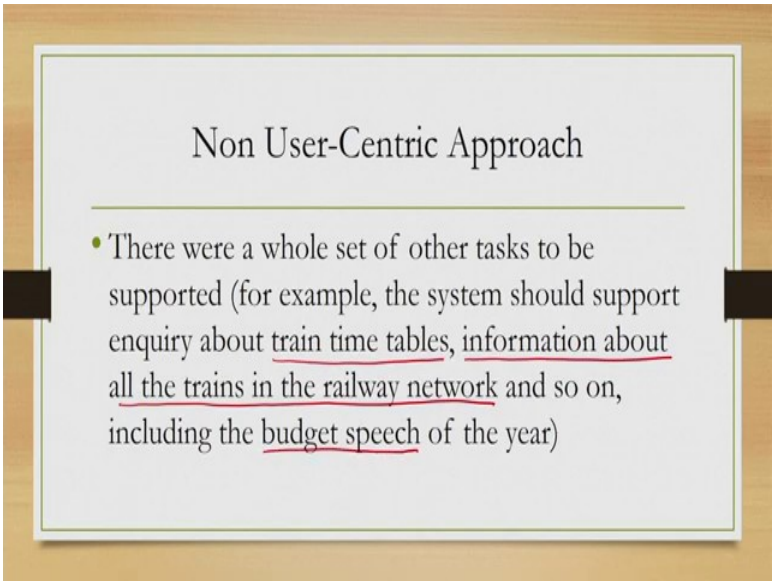

There are in fact, a whole set of other things which they were asked to support that includes maybe timetables train timetables, information about all the trains running between any pair of stations in the network, it may also include a budget speech by the concerned ministry of the year.

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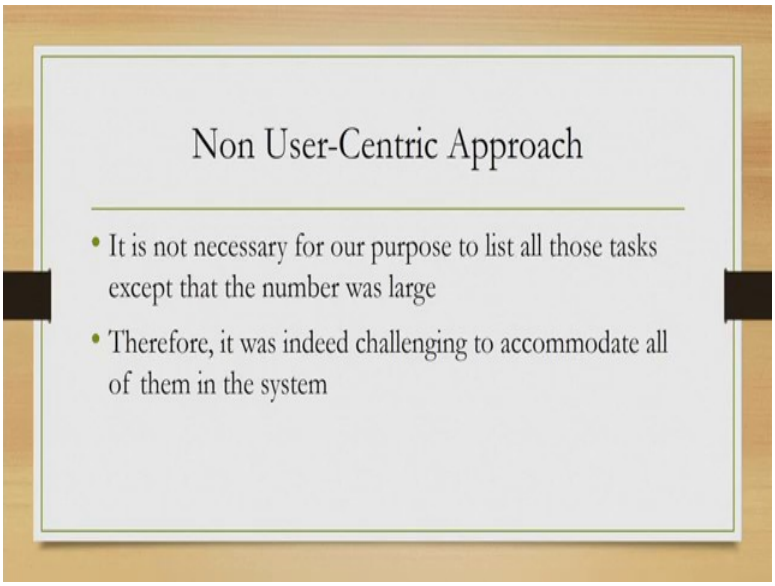

Now, for our purpose in this case study it may not be necessary to consider all these activities that needs to be supported, let us stick to our purpose that is an interface for railway ticket booking.

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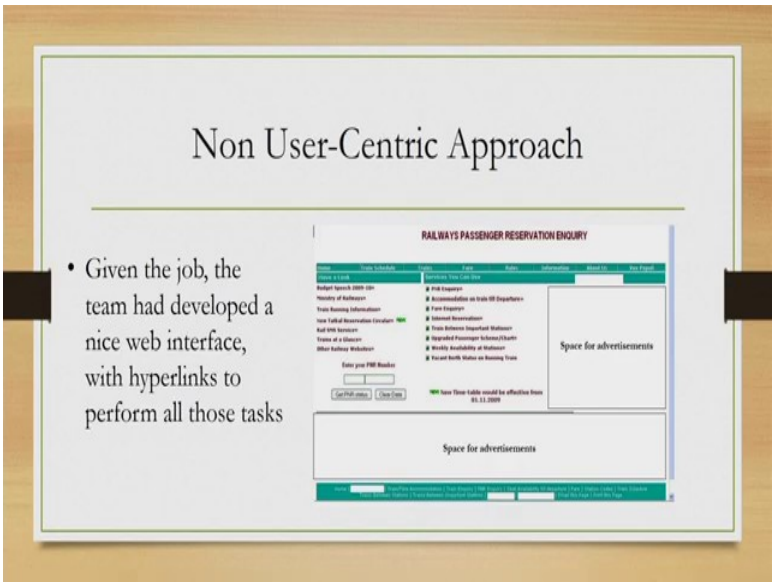

But of course, to the developer they have to accommodate all these requests of keeping other things on the interface. So, they came up with one interface, the interface looks something like this where as you can see there are lots of hyperlinks in the top part, in the middle part, in the bottom part. So, everywhere there are hyperlinks and all these

hyperlinks each of these hyperlink is meant to support a particular activity and there are some space for advertisement these are essentially unused screen area of the interface.

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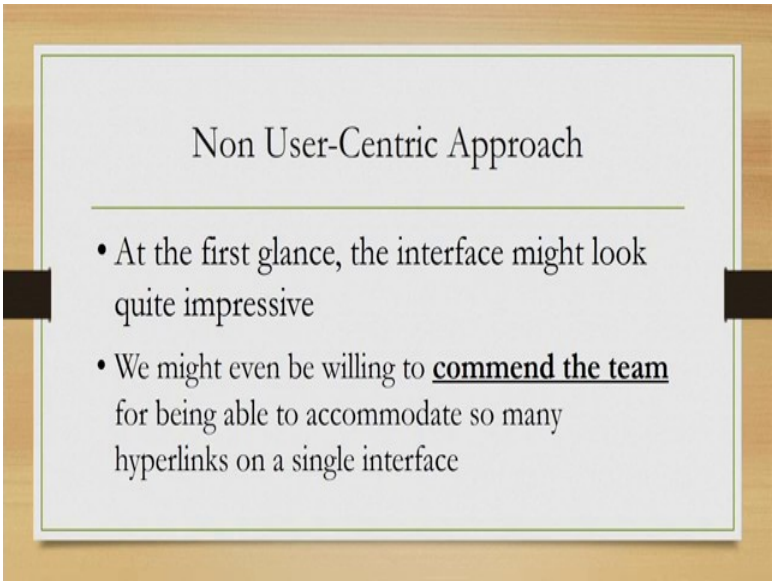

So, what is your impression if you take a look at it, it may look like a nice interface, it may look like a useful interface which serves its purpose of taking the information to the users whatever information the developers were asked to convey taking that information to the users in the form of hyperlinks.

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However, if you look at it closely you may find certain problems, certain shortcomings with respect to our objective that is to book a ticket, to reserve a ticket. So, let us have a look at the interface again using this interface if you are asked to reserve a ticket what you will do. Let us have a closer look from the users perspective.

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So, when the user is asked to reserve a ticket it is a task which involves a series of sub-tasks, in a sequence the sub tasks have to be performed.

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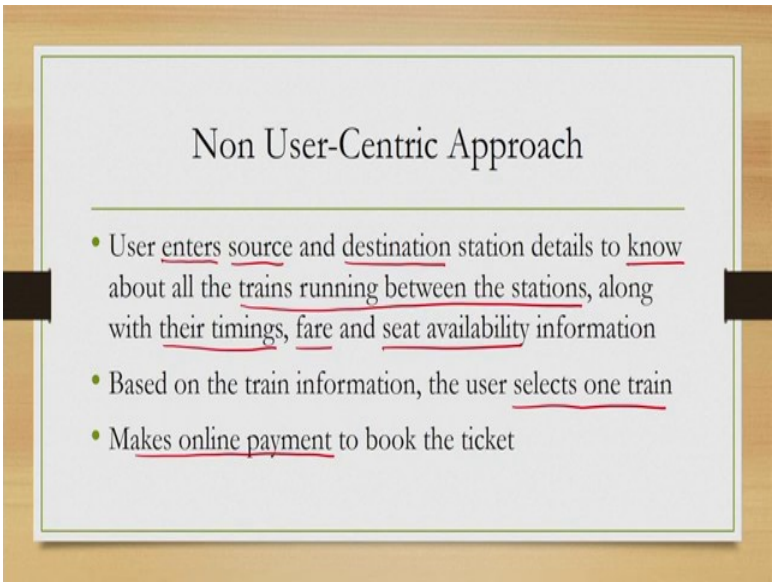

First of all the user enters the source and destination station details. So, user enters the details of source and destination stations to know what are the trains that are running between these stations, along with the timing of the trains, fare and seat availability. So, the user input is the source and destination station names and the information displayed to the users are the list of trains, the timings fare and seat availability.

Based on the information the, user selects one train and then makes a payment to book the ticket. So, these are the things that a user is expected to do and user expects that these things will be supported in the interface.

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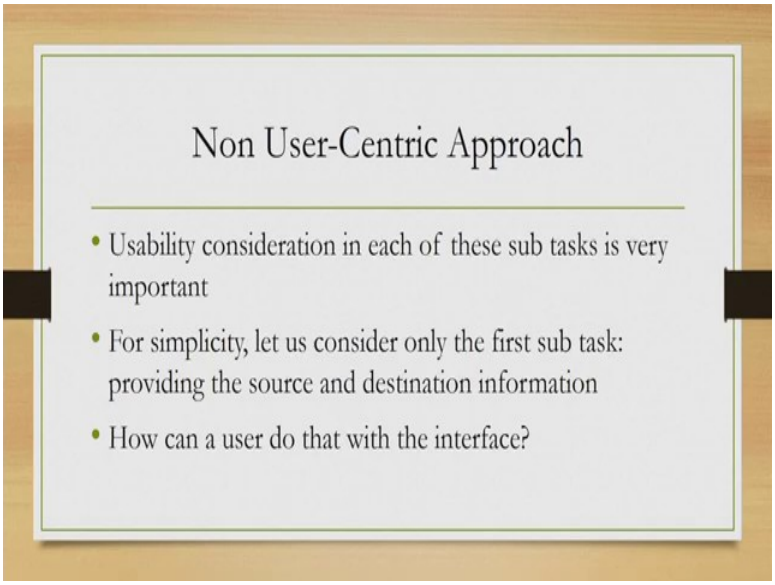

Of course each of these sub tasks should have been designed in a way says that the usability is high and each of these tasks have complex tasks from the point of view of a user as well as the system. But, for the time being for the sake of simplicity let us stick to only one of those sub tasks that is finding out a train by inputting the source and destination station names.

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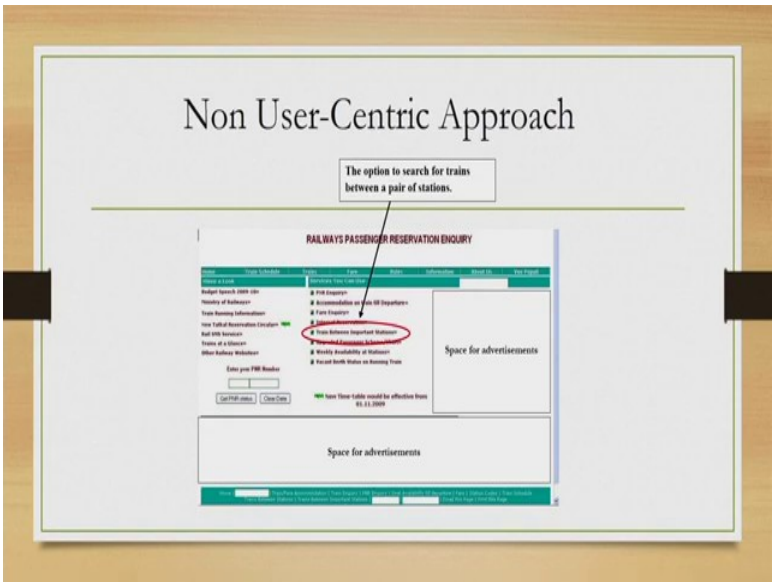

Now, if you can see in the interface if you can recollect the interface, in that interface we can actually input the source and destination station name and find out the trains that are running between stations. So, there is one hyperlink that is trains between important stations which is highlighted in this figure as you can see this is if you click on this hyperlink, you will be able to enter the name of the stations, but this hyperlink only allows you to choose two important stations.

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So, it is not necessary that you are interested in only important stations because many of the travelers may wish to travel between unimportant stations. So, in that case that hyperlink is of no use as you can see from the link.

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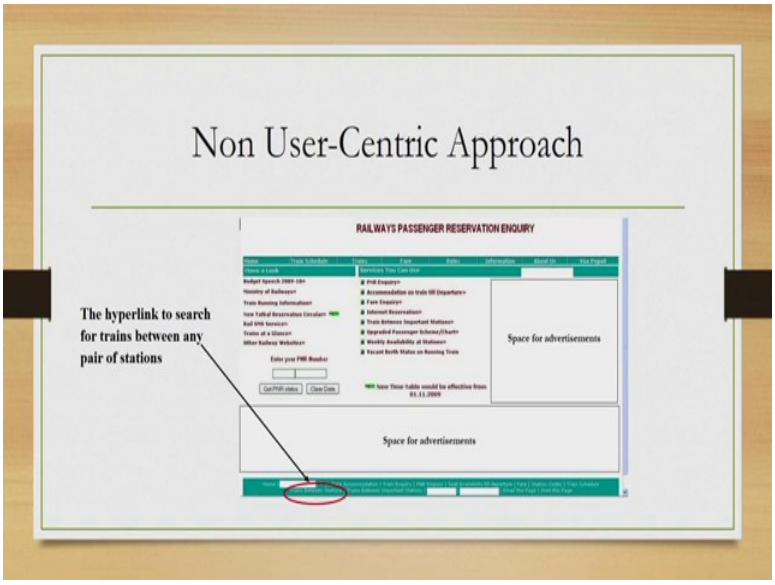

Now, let us see the interface again. In this interface as we have already seen this link is meant for inputting train between important stations. So, inputting station codes so, that you can get to see the trains. But, in the entire interface can you spot another hyperlink which allows you to input station names that are not important have a closer look and try to figure out.

Even if you can spot of course, you may appreciate that link is not readily visible it requires a lot of effort to find it out, in case you are unable to figure it out let me point it out for you it is there at the bottom where train between stations you can actually choose. This is one hyperlink which allows you to input any station name and you can use this hyperlink to search for trains between any pair of stations rather than only between a pair of important stations.

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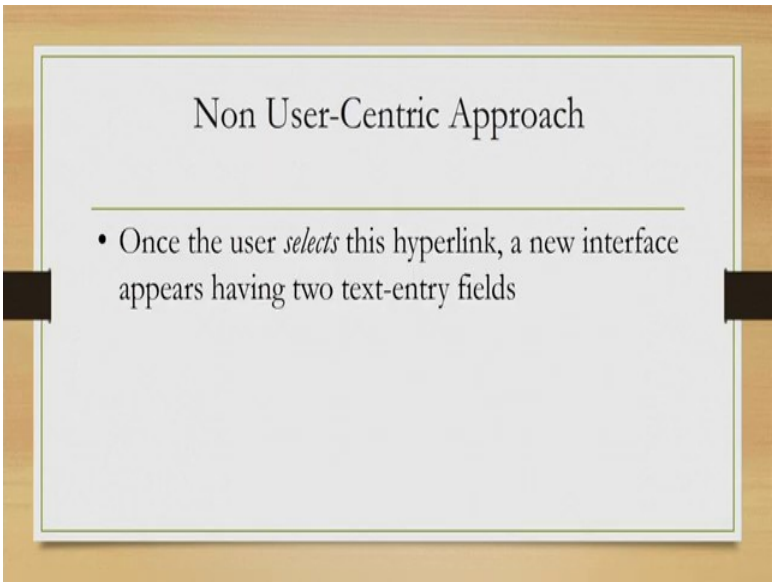

So, once the user selects this link then a new interface appears.

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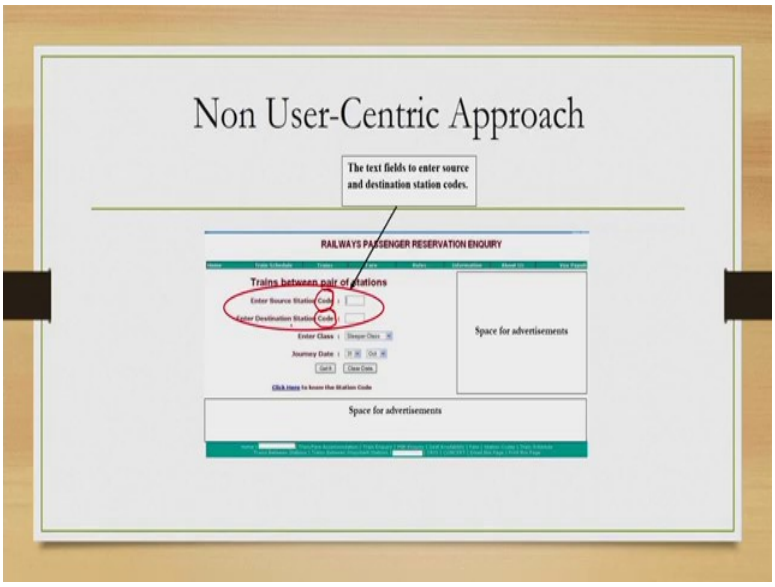

In this interface there are two text entry fields, one each for one station name; however, if you note here that instead of name you are asked to provide a station code in both the cases. Now of course, it is difficult to remember codes always. So, what to do?

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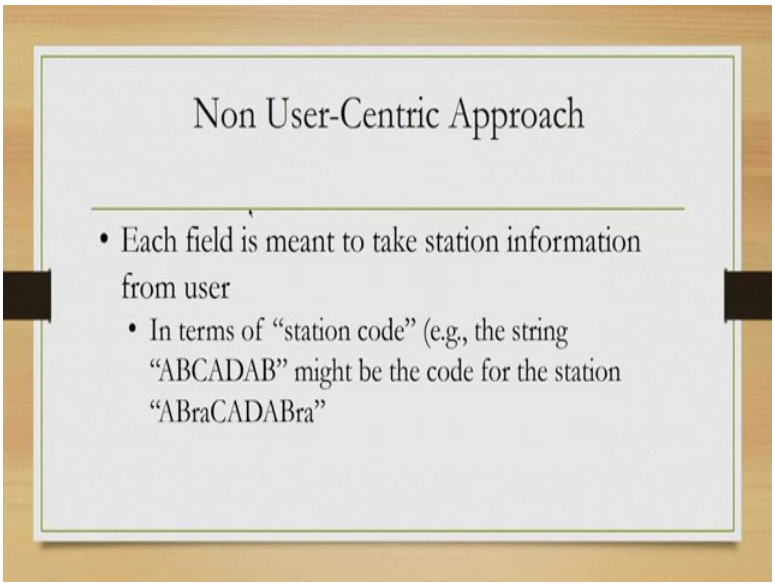

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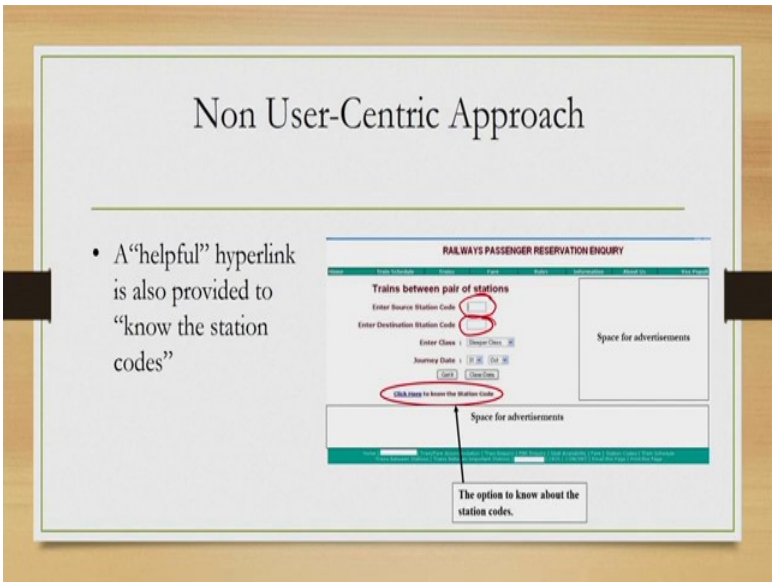

Now, there is one helpful link provided for you to find out the code. So, here is this link if you click here in this link then you will be taken to a page where you can get to know the codes of different station. So, once you know the code you are supposed to input those codes in these fields to get the details about the trains running between these pair of stations, including their fare, seat availability and other information.

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So, if we summarize the activities needed for us to know about the trains and the seat availability between a pair of stations, we can actually see that we are performing a series of activities. First of all if we are not traveling between important stations then we have to locate that link which allows us to input station codes for unimportant stations, then we have to remember the codes otherwise we have to go to another page to know the codes come back to the original page, input the codes get the details.

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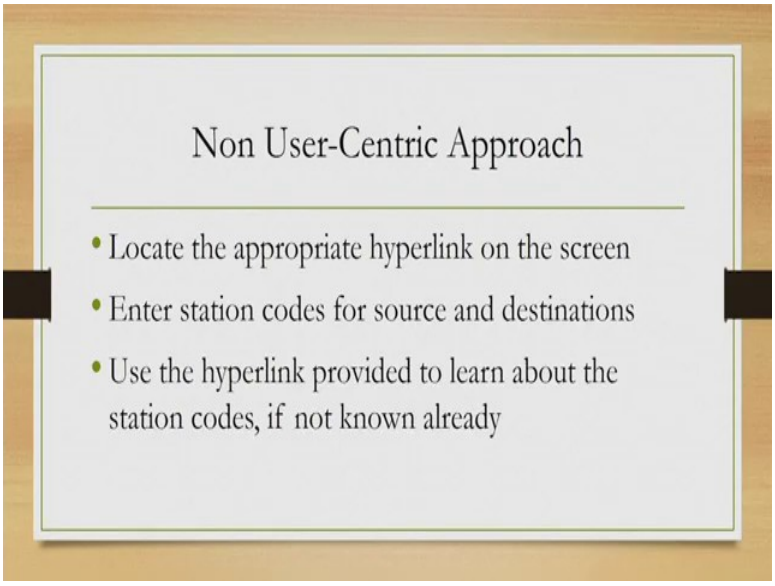

So, this is a series of activities that we need to perform in order to choose a train on which to travel.

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Clearly it may not be very easy for a user to do all these activities. In fact, there are some flaws which could have easily been resolved if a proper user centric approach was followed. Of course, at this stage we do not know what was the approach followed, but apparently there seems to be some problems with usability and a proper user centric approach probably was not followed.

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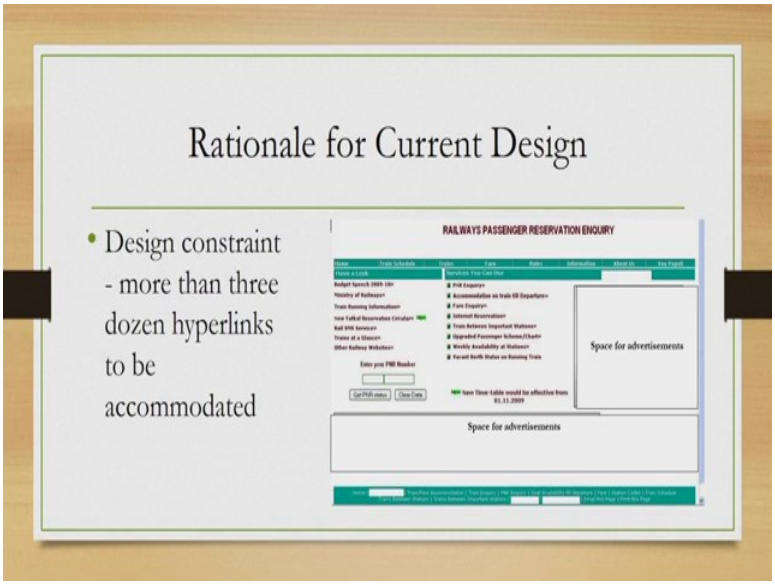

Now, before we actually talk of a user centric approach, let us see what the current design tells us. Now, in the design let us have a relook at the design. So, here you can see that there are lots of hyperlinks in fact, as we have mentioned at the beginning the developers were asked to include lots of information to convey to the users. So, what they did is they came up with lots of hyperlinks each hyperlink points to a piece of information and they organized the hyperlinks on the interface.

Of course, it is not easy to organize so many hyperlinks, it is always challenging and then what the designers did is they came up with a particular organization.

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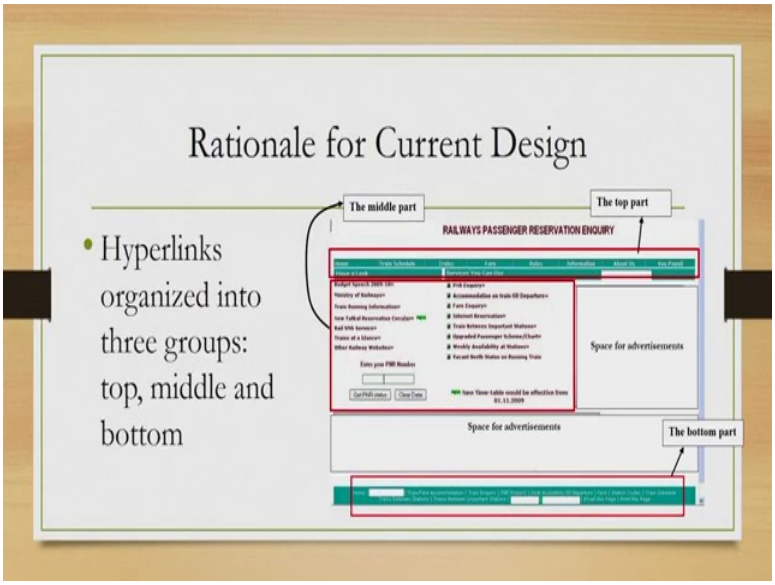

In the organization there are three groups; as you can see in this figure a top part, middle part and a bottom part. Now, in the top part there are few hyperlinks, in the middle part there are few hyperlinks and in the bottom part there the remaining hyperlinks.

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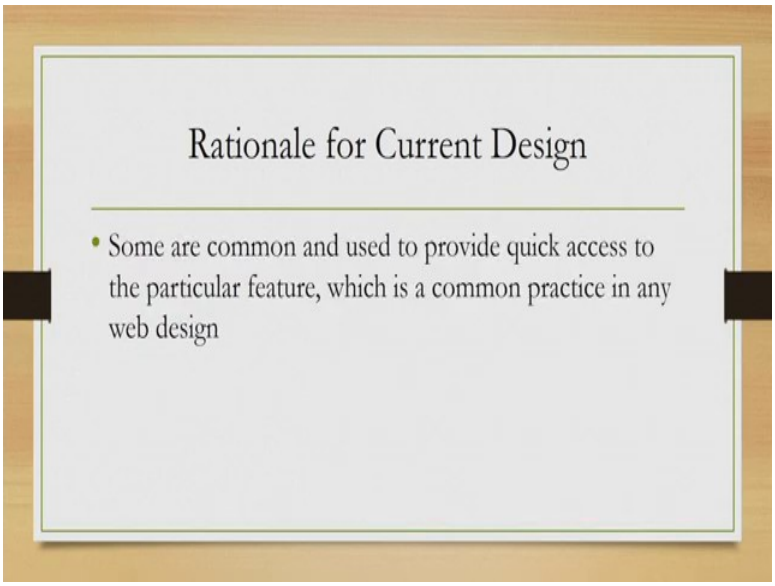

Now, among all these hyperlinks all these pieces of information some are common and maybe required frequently, some may not be common which one are common. Our first task is to find out which are the pieces of information that are likely to be frequently accessed by the users. So, for that we need to do certain experiments, we need to understand certain characteristics of the user for what purpose. So, if you have managed to know which are the features that are likely to be accessed frequently by the end users.

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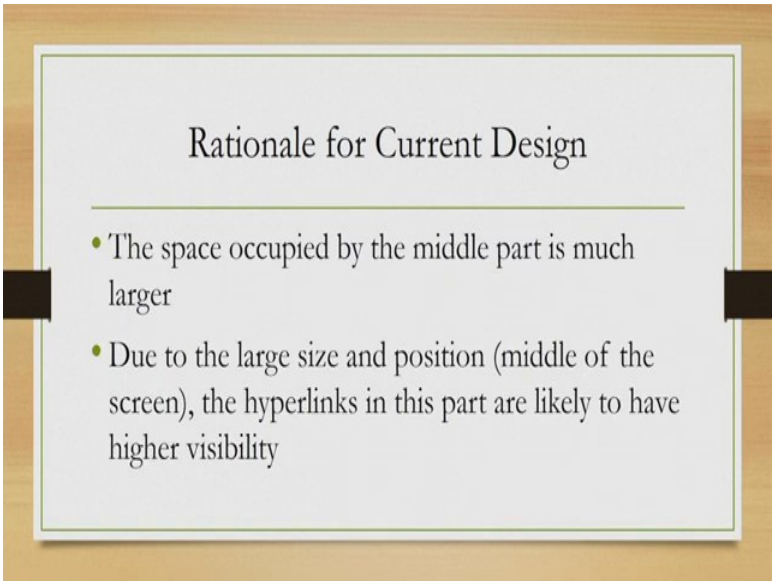

Then a common practice is that it should be most visible and quickly accessible and in these three groups middle, top and bottom in the design as you have just seen, clearly the middle part is the largest among the three groups. So, the purpose of this middle part is to make the information that are contained in this part to be most visible and most quickly accessible rather than these other two parts.

So, if we know that which pieces of information are likely to be accessed most frequently then we can include those in the middle part and other information may be there, but need not be so prominent or be part of the middle part. So, for that we need to know what the user wants whether the info which information to keep in the middle part that the user will find most useful and user is likely to access very frequently.

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It is always challenging to put this large number of links in a website in a way such that everything is quickly accessible. So, that is not the idea and we have to give relative weights to the links to the information and in the current design there is a problem with the relative weights given.

Probably, a better approach would have been to first know the users what are the requirements, what are the expectations of the users based on that you assign relative weights to the links and accordingly you plan where to put which links. So, which links should come in the middle part, which links should go into the top or bottom part.

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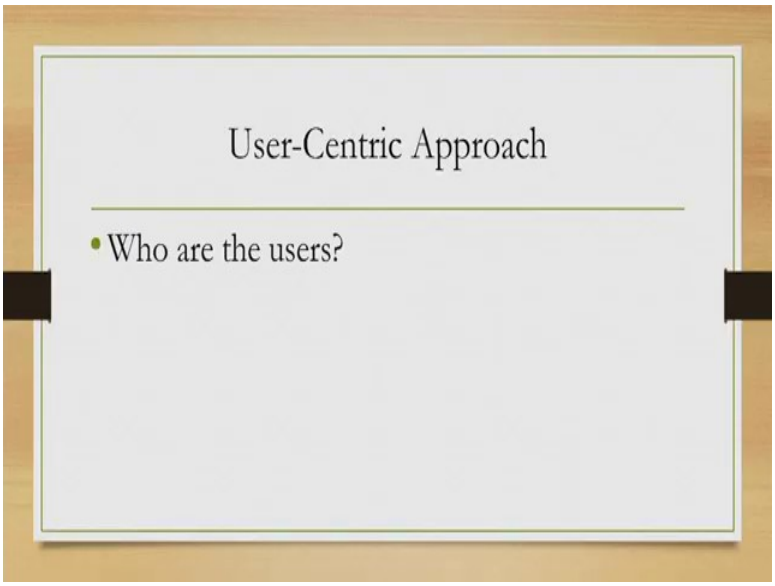

So, our first thing is to know the user who are our users.

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If I ask you this question immediately you will say that probably everyone, you are likely to say that probably everyone will be the users because all of us wants to travel and that is a quite logical answer that all of us want to travel. So, everybody should be the user, but look at the system closely.

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Do you really think that everybody is meant to be the user of the interface or there are certain characteristics that are expected from the user of this particular interface? First of all everything in this interface is in English. So, unless you know English definitely you are not going to be using it. So, you are expected to be conversant with English. Secondly, those who are likely to book tickets using this interface it is expected that they have some familiarity with online transactions since online payment is involved.

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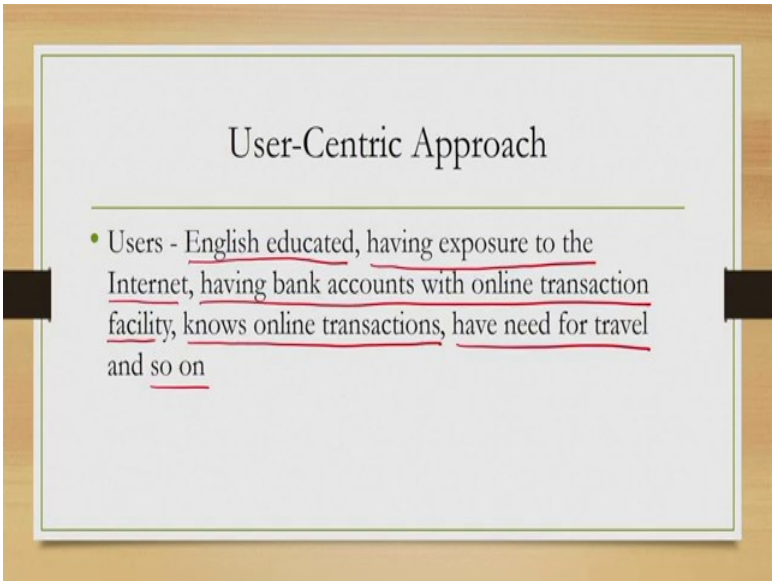

So, if we summarize then our users are not everybody, but English educated having exposure to the internet, having bank accounts with online transaction facility, knows how to perform online transactions have need for rail travel and similar things. So, this if we put these conditions then of course, a large number of potential users will be ruled out, but still that will retain still a large number.

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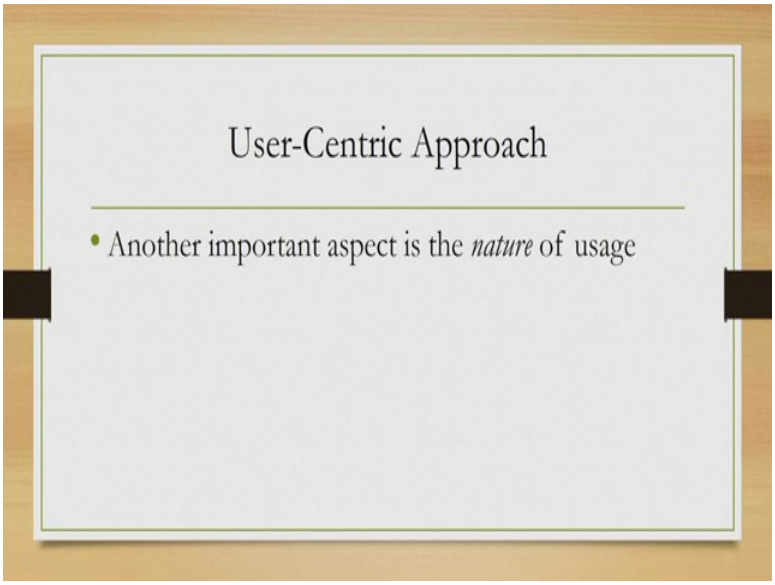

The second consideration is the nature of its, how the users are likely to use it.

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So, it is not likely that people are going to use it every day, every minute it is not very regular because our travel dates are occasional. So, we may need to use it occasionally we have already seen such categorization of users novice intermittent and expert. So, here we may say that the users are likely to be intermittent, occasionally they want to book tickets using the system.

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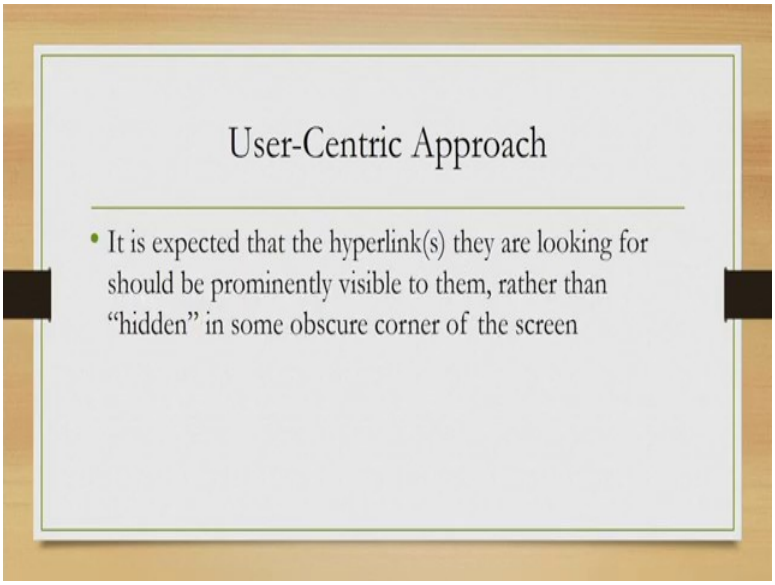

So, if we are trying to design something for intermittent users then ideally what we should do is basically what the user wants this those should be prominently visible, otherwise user will forget where to find them and they will spend a lot of time finding those hidden links. So, essentially we should not keep the links that are required by the users hidden in some obscure corner of the screen as is the case in the current design.

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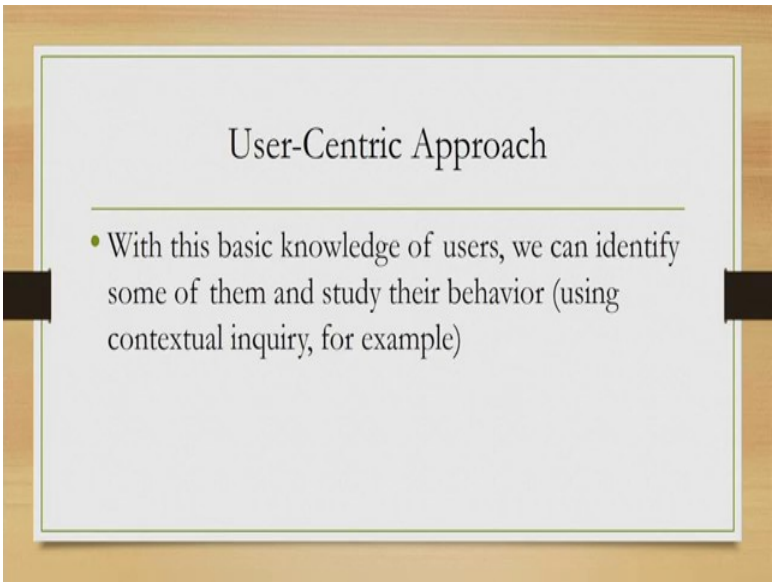

So, how to find out what links or what information are going to be frequently access, what information the user expects from the interface. We can approach this problem with various techniques one of course, that we have seen before is contextual inquiry, we can try to observe and find out these things.

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But, assuming that we have already performed a contextual inquiry such studies are likely to reveal relative importance of different pieces of information.

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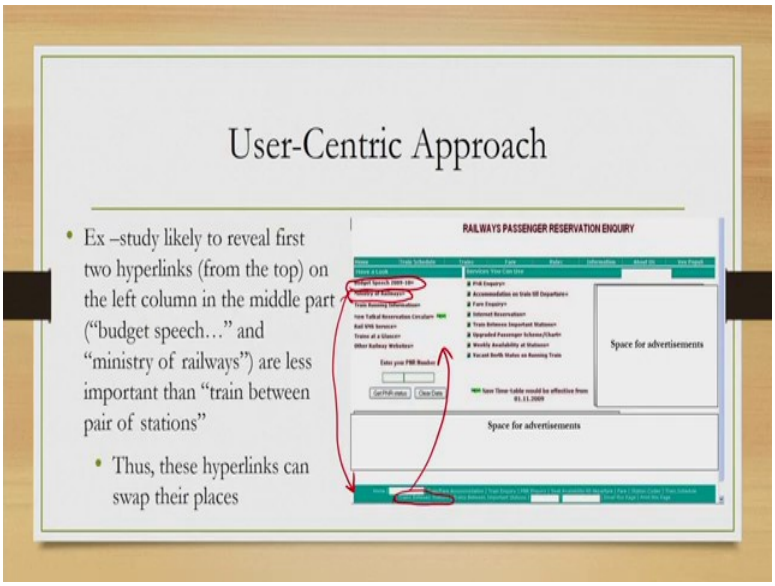

For example if we see this screen again probably, the budget speech may not be of immediate concern to the users or this ministry of railways information related to it may not be of immediate concern to the users. So, these can be kept in here and we can bring more important concern of train between stations here because this middle portion is the most visible portion as we already have seen with bigger fonts and better contrast and if we keep something here then it is, easily visible easily recognizable and easily accessible.

So, with contextual inquiry we can find out that some links that are at present kept in the central region may be pushed towards other regions and some other links which are likely to be of more importance can be brought into the central region. So, that they are easily accessible and easily visible.

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However, as we have already noted before study cannot reveal everything, sometimes the designers have to take decisions with unknown consequences. Now, the best way to do that is to follow some guidelines. So, if you follow guidelines then the consequences are likely to be positive because the guidelines were designed after lots of studies.

So, once you have made some design decisions you can go for prototyping your design and get the feedback from the users whether that was done in the current design or not we do not know, but as the final design reveals there are certain flaws which are very obvious. So, clearly or probably the prototyping and early feedbacks were not taken before the final product was developed.

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It is also questionable what kind of guidelines were followed because as we have noted very basic things are not clearly visible; whereas, something which apparently are not very important or clearly visible and kept in a very central position for quick access which is not very intuitive. So, essentially we are not sure what design guidelines were followed.

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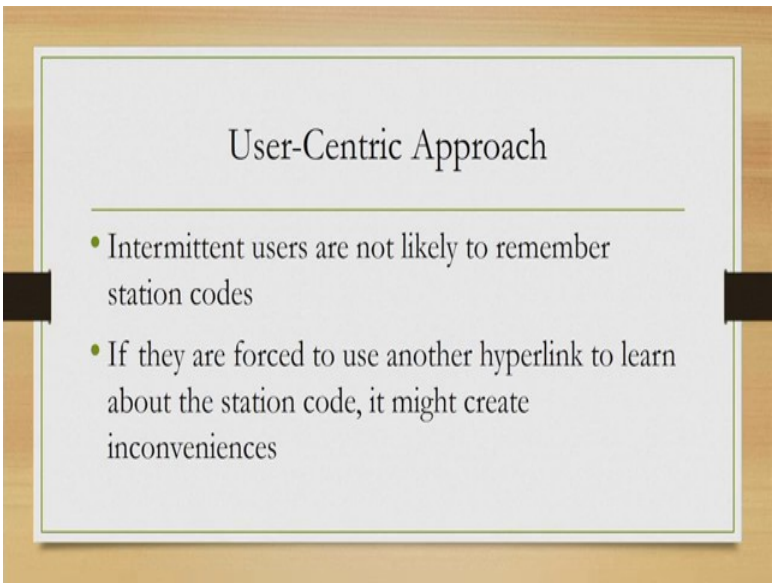

So, another example we can give where we can say that guidelines were not properly followed, consider the case of the entering of station details. So, in the current design

what the users are expected to do if you may recall is that they have to enter station codes and if they do not remember station codes then they have to open another page know the codes and then make the entries. Clearly, this is not a very good solution why because we are talking of intermittent users.

Now, these users are likely to come back to the interface occasionally not very frequently. So, they are not likely to remember the station codes whenever they want to book a ticket. So, most of the times they probably have to use that other web page to know the station code and use it. So, essentially that increases their time to enter the station names with station codes.

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Instead what could have been done is that now that design of course, violates certain generic guidelines. We have already seen the eight golden rules of Shneiderman and if we try to apply those rules, those 8 rules into the to analyze the current design. We may likely to find out that the rule violates the design for universal usability, the 2 nd rule where we are supposed to basically design it for frequent users or experts, intermittent users and novice users, the current design is clearly meant for the experts who frequently uses it, but not for intermittent users.

So, it violates the second rule of universal usability. The 7 th rule on keep user in control because the user does not know how to get the code. So, if you come back occasionally then probably you will forget how to get the code. So, you will search and then note the

link and then open it. So, that requires you to remember a few things occasionally you may feel that you do not know what how to do things.

So, that essentially violates the 7 th rule keep users in control, and also it expects the user to remember too many things in terms of where to find the link first link how to get the second link and so on which may affect the 8th rule that reduce short term memory load.

So, essentially the current design with a very casual app analysis reveals that at least three rules of the design guidelines proposed by Shneiderman are likely to be violated with the current design; namely, the 2 nd rule design for universal usability, the 7 th rule keep users in control and the 8 th rule reduce short term memory load.

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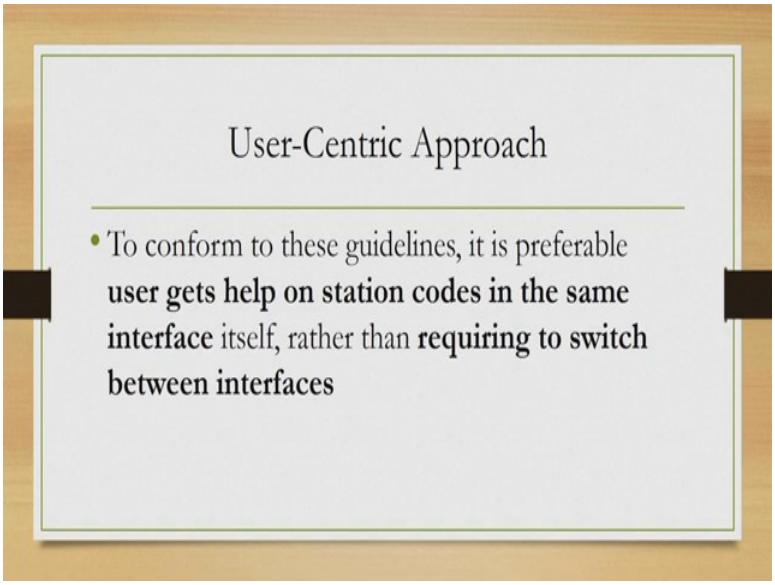

So, to conform to these guidelines what we need to do is we help the user enter the station names without having him or her remember how to find out the codes for the stations. So, essentially what we are trying to achieve is helping the user avoid switching between interfaces to get the code and help him enter station names without putting in too much effort in finding out how to find the code. What we can do is we can use a predictive input.

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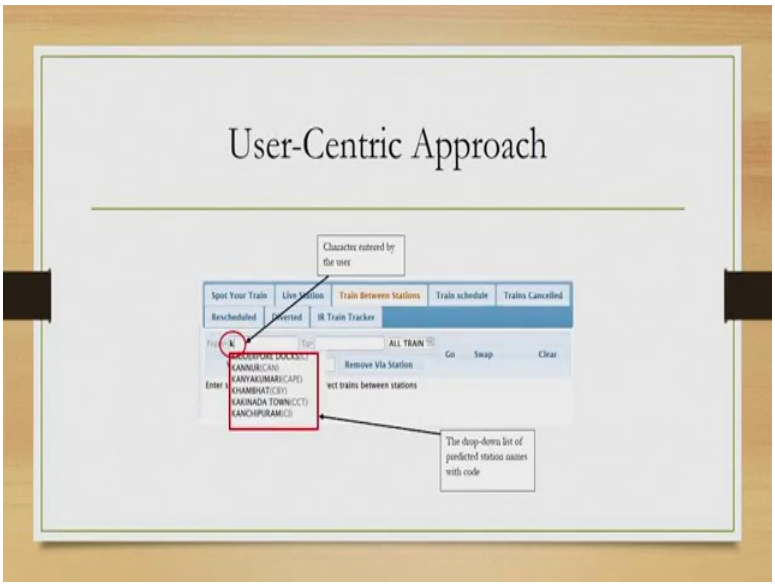

So, in this case what happens is that the user starts entering. So, the station names of the station them it is more likely that the user will remember the name rather than a code, and once the user remembers the name then definitely he or she knows how to spell it. So, he or she will start entering the characters one by one, with each character a list of possible station names will appear and this list will help the user identify the station he or she is looking for.

Instead of remembering the code recognizing the name from a list is much easier task. So, this predictive approach may help the user identify or enter the names without requiring him or her to switch between interfaces to find out the code and then enter it. So, this is one simple solution which tries to address the shortcomings in terms of violation of design guidelines, but implementation of this is of course, not as straightforward it requires a lot of background processing.

But, to the user the interface is much better or likely to be much better more usable compared to the current design where the user needs to remember a lot of things.

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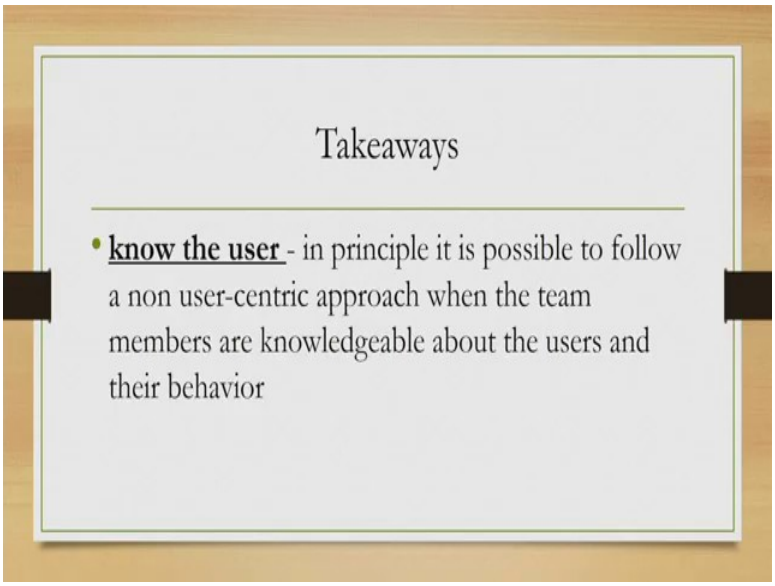

So, essentially what we get what is the message of this case the first thing is that we have to know the user. So, we can develop any system without following a user centric approach which seems to be the case with the current design of the ticket booking system we have discussed. It is possible to design because based on your or the designers experience and intuition you can always come up with such a design.

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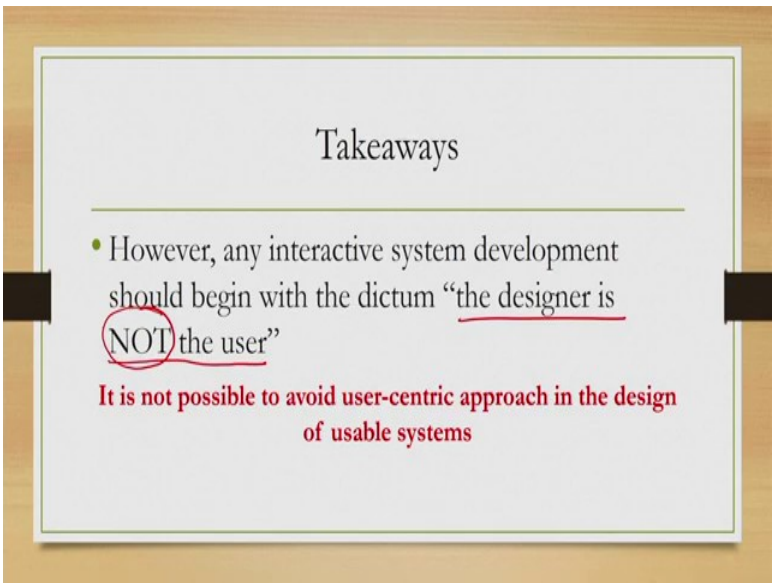

However, you should always keep in mind when designing a user centric system is that the designer is not the user. So, if you are designing something assuming that you are

able to use it. So, probably all the users will be able to use it that is likely to fail. So, you should always keep in mind that the designer is not the user. So, you have to know the user, you cannot assume that you are the user.

So, there is no need for you as a designer to know what the users want because you are already assuming yourself to be the user and you already know what you want. So, that is the first thing that it is not possible to avoid user centric approach in the design of usable systems because you as a designer is not the user. So, you have to know the user and to know the user you have to perform certain studies, you have to take help of certain approaches essentially you need a user centric approach.

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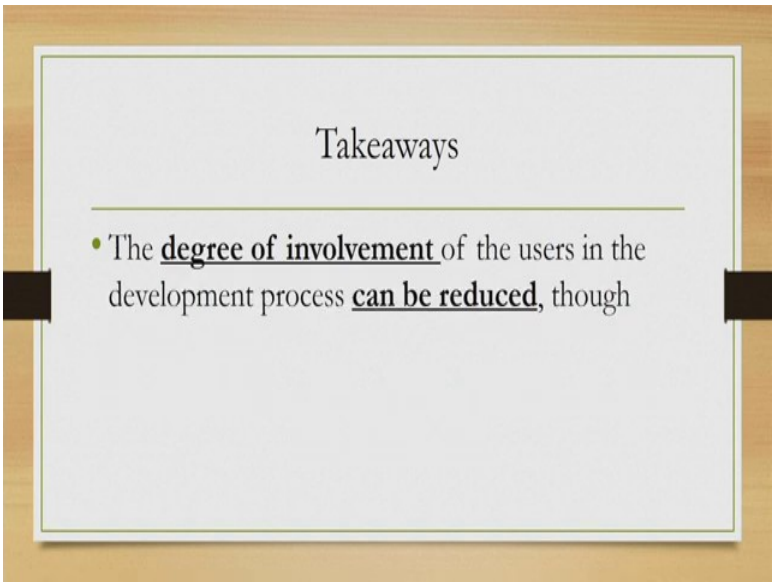

However, you can actually reduce the degree of involvement. So, user centric design refers to involving the users in the design process. So, either in active mode or in passive mode, but there you can actually reduce their involvement in many ways, one is suppose you have already have some experience about designing similar systems for similar group of people.

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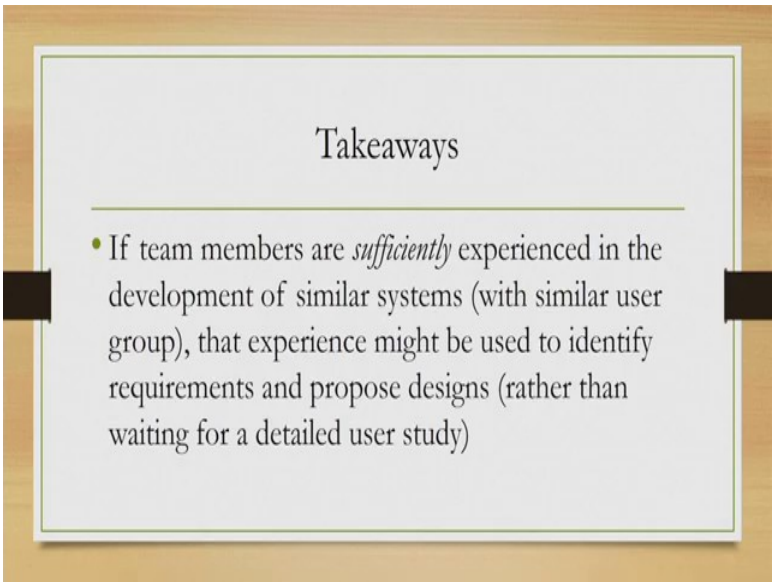

So, you can utilize that experience you already that you can claim as knowledge about the user some idea you already have. So, based on that you can start building your system rather than waiting for a study to know the user and you can also use the guidelines. So, guidelines again are knowledge obtained by studying the users.

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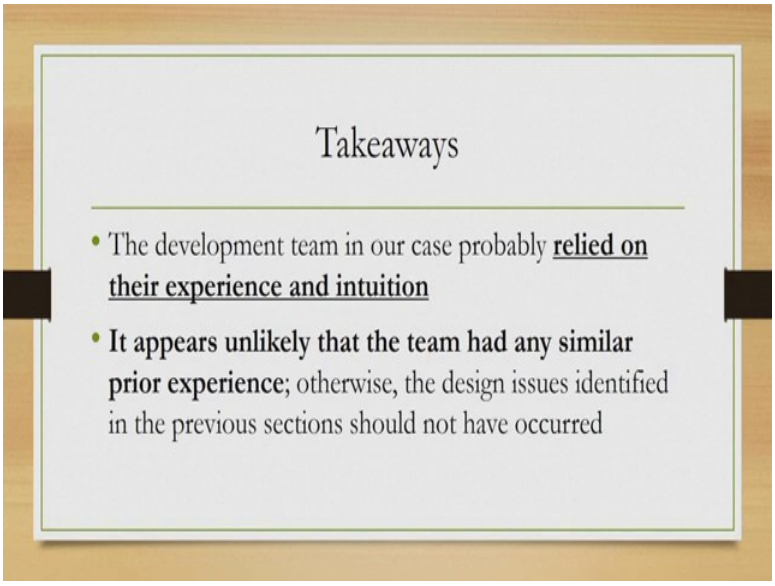

So, if you stick to the guidelines or if you try to compare your design with the guidelines at every stage, then it is likely that you can come up with a better system as compared to following a non user centric approach. In this particular example as we said you can rely

on your experience and intuition of developing similar systems in the past for similar group of users, but in the current system as we have seen it violate certain guidelines. So, probably the team was not experienced enough in design of similar systems.

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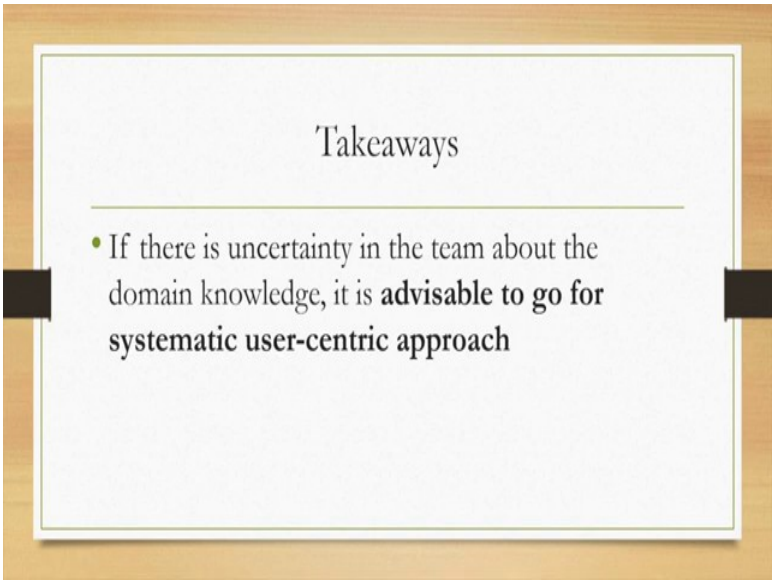

So, there is an element of confusion now as a team development team or design team if you are not sure about your level of experience or corresponding intuition about the particular group of users and their likely expectations, then it is always advisable that you go for studying the users and follow a systematic user centric approach.

So, the takeaways are from this case study is that you can build a system which are likely to be used by layman users without following user centric approach, but most likely the system will have many usability issues. Instead, if you follow user centric approach, you may avoid those issues and make the system more acceptable to the end users.

Now, to follow user centric approach it is advisable that you know the user through studies; however, if you have prior experience if you know or have developed systems for similar group of users before then that experience and corresponding intuition you use to build the system. Along with that it is advisable to stick to design guidelines because those are obtained after much studies together they can lead you to a better design.

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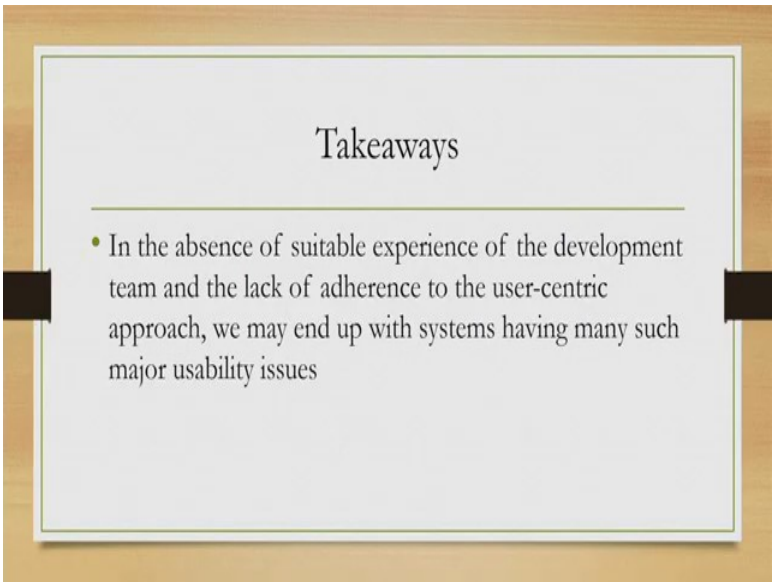

Otherwise, you will end up with systems that are having major usability issues, otherwise you will end up with systems that are having major usability issues.

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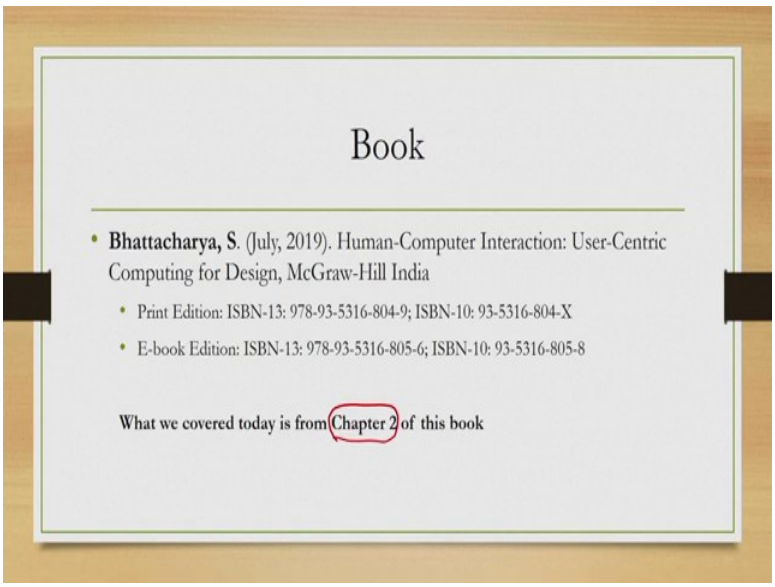

So, the case study we have taken from this book you go to the chapter 2 of this book at the end of the chapter this case study is mentioned with much more details. So, you can refer to this corresponding and in the book to go through the study.

Thank you and goodbye.