Computer Aided Decision Systems Industrial Practices using Big Analytics
Professor Deepu Philip
Department of Industrial and Management Engineering
Indian Institute of Technology Kanpur
Professor Amandeep Singh
Imagineering Laboratory
Indian Institute of Technology Kanpur
Lecture 41
Usability Problems & Usability Design Process

Welcome back again and we were discussing what are the major issues, typical issues when Decision Support System user faces, when you have a Web-based Decision Support System. So, let us without wasting much time let us look into it.

(Refer Slide Time: 00:28)

So, Typical Web-site Usability Problems and we can say that this is the Web-based DSS, it is also applicable to the Web-based DSS.

1) The first major problem is what we call the Navigation Problem. And this has two aspects to it.
a) The first one is knowing where you are.
b) The second aspect is finding what you want.

So, knowing where you are is like at what stage of decision making the DSS user is? Are you in data collection? Are you in hypothesis testing? You want to know at what stage you are as part of this.

Finding, what do you want is, are you able to find the answers for the complex problem or complex decision problem, that is the second aspect of it? So, this is more about the navigation thing. Then the second Usability Problem comes. So, these two basically challenge the decision maker.

2) The second major thing is the structure that challenges the decision makers is the structure of the website that runs the DSS. So, how is the website structured? So, sometimes some people will like the structure, some people may not like the structure, so the structure should suit the user styles and other aspects of the decision maker.

3) Then, comes up the third one, the third major aspect is what we call as it comes out of the Layout. So, the Layout, it is again, two major problems we can think about.

a) The number one is the need for sufficient white space. So, if I take one slide and keep writing everything from one end to another, without even giving you any white space, you will pretty much soon be fed up, you will not be interested in looking into that slide. So, that is the other aspect.

b) Then use of large graphics. Sometimes, the graphics become so huge that you will end up moving one page to another. Sometimes you can see people using a touch screen to move stuff where they are around to make sure that you are the entire thing if you understand the entire thing and go from there, that kind of thing.

c) Then, the fourth major problem that I usually tell people this happens is what I call the Google problem. And, this is an interesting problem, because I think all of what Google web page is all about. So, you have a page here and something to type and search, and research something like this, another one. So, people really would want a system where you can type how to make more money in the business of doing something, say that press a button, and magically the answer should appear. So, that is they want this one click solution sometimes, which may not be very feasible for complicated open ended business decision problems.

So, they would really like to compare the existing Decision Support System with Google and that is why we call the Google problem, these clicks stuff. So, this Google problem is something that is a notion which is with the user because that person is the CEO, CFO, CXO or somebody like that. So, this may not be this may be something that the designer of the DSS will allow to face very frequently.

(Refer Slide Time: 04:49)
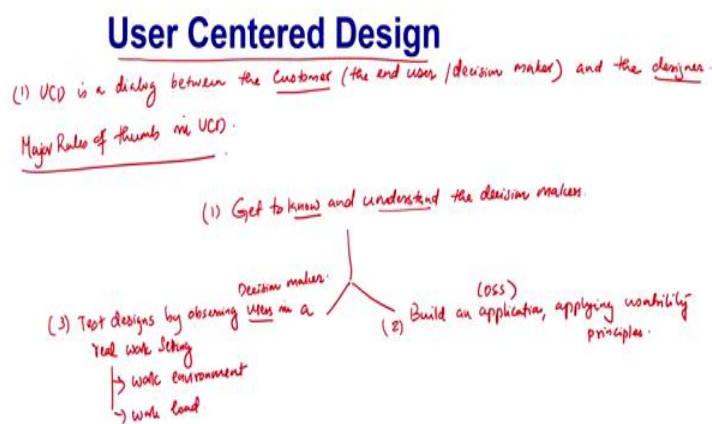
So, then we talk about UCD (User Centered Design or User Centric Design). We have discussed a little bit before this in the previous section, but let us just look into this.

1) So, the major aspect is that UCD is a dialog between the customer (the end user we can think about it or the decision maker) in this in the dialog between the customer or the end user or decision maker and that designer. The dialog is between the customer and the designer, or the decision maker and the designer, or the end user and the designer.

So, we have studied already what is the dialog and all aspects previously, please refer the previous material to get that, but let us talk about major rules of thumb in UCD. And in this case, I would give you three major rules of thumbs, three major things,

1) Get to know and understand the decision makers. This is very critical, who are they, you should know and understand, not just going and knowing by name, you should go, you should know them, you should know them as personnel, you should know their personality, you should understand their decision-making styles and you should also understand how do they do their work, are they more a data driven decision makers, are they more like a committee-oriented decision makers, Delphi method, expert opinion. So, depending on the style of the decision maker, you should be able to create a system that will support the decision maker style, that is the first aspect.

2) Then comes, the second aspect which is to build an application, applying Usability Principles.

3) Then comes, the third aspect test designs by observing users in a real work setting. So, the user here is the decision maker. You test your design, test your DSS application, build an application in this case it is a DSS, a Web-based DSS and then test your system or test your design by observing the decision maker in a real work setting. So, this means two parts:

a) work environment,

b) workload.

So, these three aspects allow you to build a better Decision Support System in which the decision maker, the top-level decision maker, is the central aspect of the decision making.

(Refer Slide Time: 08:39)
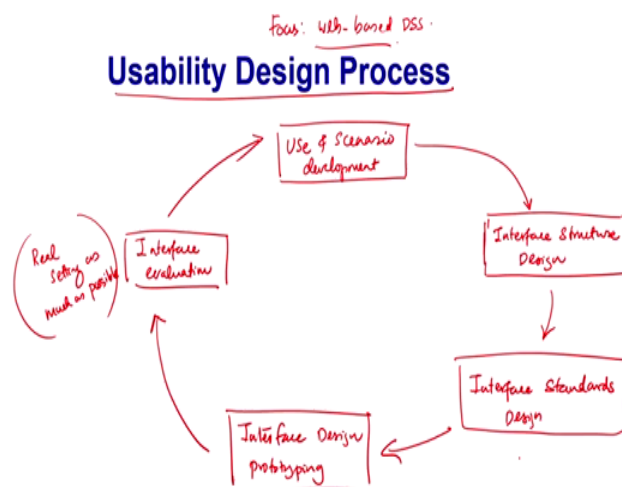
So, with that now, let us look into what he called the Usability Design Process. What is the typical design process of how do you build the Usability into the system? So, this is focus on Web-based DSS. This is applicable to everything but it is more designed towards what you call us the Web-based DSS.

- So, we will start from here as Use and Scenario Development, that is one part. So, we want to find out what is the use of the system and what are the scenarios in which the system will be used and how will the decision maker use the system. So, look at all major decision scenarios, then work on it.

- From there you go to the next step, what we call the Interface Structure Design. So, now you design the interface structure out of this. So, once you develop the scenarios and the usage of it. From there you create a structure that will support the usage and will support the decision-making scenarios.

- So, once this interface structure is designed, then what you do next is the Interface Standards Design. So, what happens here is you apply standards to a design now, apply the interface design standards, say, what do you are going to do and all those aspects, especially, what should be the size of the button, what should be the color of the submit button, what should be the icons that are used, all those aspects should be part of this one.

- Then comes, the Interface Design Prototyping, this is the next aspect. How do you prototype whatever the design standards you have done? From there you make a prototype.

- Then after that interface prototype, Interface Evaluation. You evaluate what that interface is. You basically find in the real setting as much as possible, that is the second aspect.

So, then you again filter your usage scenario development, then redesign the interface and do until you think you are satisfied and you have taken all aspects of the decision making into consideration.
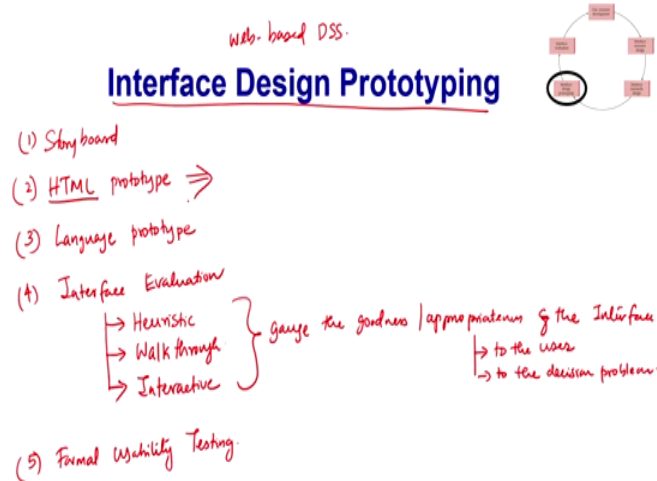
So, with this, one of the aspects that we want to talk about, the focus from here onwards in this class will be the Interface Design Prototyping. Other aspects we have already discussed in the previous lectures and hence, we will be more looking towards Interface Design Prototyping.

1) So, the first step as part of this is what we call the Storyboard. The Storyboard is more like the Storyboard of the movie and etcetera, but it will actually tell you what are the usages of the Decision Support System and what are the scenarios in which the decision maker is going to use a system. So, all those aspects, if this decision making comes into picture how will the person use it, if this scenario comes in how will the person use it, if two people are to be collaborating then how will the system be used, all those scenarios are done as part of that, but that is all integrated in part of the Storyboard. So, your previous one, the use and scenario development gets integrated as part of the Storyboard.

2) Then comes the second aspect of it which is the HTML Prototype. Remember, we are talking about the Web-based DSS. So, the User Interface Prototype for us is the HTML (Hypertext Markup Language) that is what we will be using. So, for us the prototype is literally done with the help of HTML as this.

3) Then the third one is the Language Prototype. It is not the programming language but the language, the User Interface language. How will the language in which the system will

interact with the decision maker, is part of this prototype? So, that Language Prototype happens on the top of the HTML prototype.

4) Then comes the fourth step and the fourth step is the Interface Evaluation. How do you evaluate the interface and there are three major aspects to this? The first major aspect is,

a) Heuristic evaluation- Heuristic means you apply a different rule of thumbs. So, like you get five decision makers and you give them the prototype and you tell them you are going to use this and make this particular decision and let me find out what is the time. And, ideally in a person who is well versed with this decision making, let us say the person takes 15 minutes to make a decision using a Decision Support System, that decision should be made at least within 15 minutes, at most within 15 minutes. So, that kind of evaluation is the time taken to do the decision, shortest decision time etcetera. There are so many heuristics available. some aspects will be through the heuristic.

b) walk through- So, you make the decision maker or the top person who is suppose user, the decision support the system user to make you walk through the system, and so that you can understand how much the person understood the interface and if the understanding is correct, if there are misconceptions, then you can clean it up better.

c) Interactive- There are many ways people do this. One classic example of it is hand holding. You have a computer screen; they have a computer screen and whatever you do they mimic what you do and that typically comes in the form of interactive aspects.

So, these three things actually will gauge the goodness or appropriateness of the interface. So, what is appropriateness, it is in two angles, to the user and to the decision problem. Both aspects the user or the decision maker and which also should facilitate the decision problem.

5) Then, comes the last part, the fifth part, that is how do you do this. That is the formal usability testing. You conduct a formal testing, in which you basically get experts and the people who are known for this kind of thing, they come and they look into how people use the interface. They evaluate the interface on different matrices, and from there you come up with a composite score and other things and then say this is the designing score, this is the usability score, this is the ease-of-use score, this is the effectiveness score etcetera, etcetera etcetera and at the end of the day, your interface is like, this is 80 percent fit for what this one is, 40 percent fit for whatever it is.

So, that kind of aspect can also be done as part of the User Interface. So, from today onwards, from this point onwards, we will be focusing more on the HTML aspect of this one. So, we would be using it to design how this aspect is done.

(Refer Slide Time: 17:09)

So, how do you Create a UI prototype, and especially for a Web-based Decision Support System. How do we do this?

❖ So, the main rule is, low fidelity prototypes are good, never underestimate this, you should always remember that if you can create a low fidelity prototype, they are really good because it actually helps you to focus on the main elements. So, some of the few examples'

1) Paper prototype- People would laugh at this, but I will say it is a very powerful tool. Paper prototype is a very good way to do this.

2) Visio/HTML/PPT- These will allow you to focus on the main elements or take the Storyboard from there identify the main elements, and then around the main elements, you make a design, you do not doubt, you are not worried about too many other minor aspects. That can happen in the second, third, fourth iterations of the design, but the meat of the matter can be fixed as part of this.

So, here is an example. So, if you look into this, you can see this is the low fidelity, this is what you call a low fidelity mockup prototype. This is how the initial design, the first design of Facebook was created, if you look into this. So, they took some pictures from the internet, they cut it down and that made it into this and then you can see this is using pen, sketch pens, colors, etcetera. So, some of the major aspects.

The meet of the User Interface, which you can see many of the elements, the person's DP, whatever it is, you talk about the friends and all those kinds of aspects are very clearly visible as part of the low fidelity prototype that is created. So, this is a very, very good example of what I low fidelity paper prototype, this is a paper prototype.

(Refer Slide Time: 19:32)

Symmetry: Law of Proximity
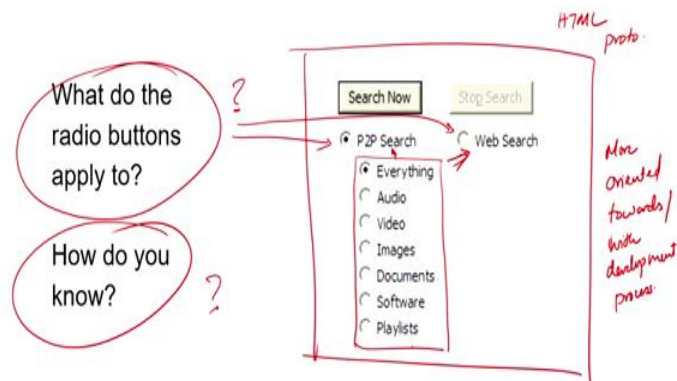
Now, if you want to create another prototype, like this is an HTML prototype, HTML proto. The two things when you do a prototype like this, I also just used to, what is this set of buttons, just think about this. This set of buttons, is it applicable to here or is it applicable to here? From the design of it, it looks like it is applicable to P2P search. It could be applicable to web search also, so this question what do these radio buttons apply to, is it to this or this. And, how do you know that is critical? What tells you that is applicable to here can be in two different colors and this and the third different color etcetera, so that nobody knows.

So, these kinds of issues can be easily identified when you make a prototype but this is more oriented towards or within the development process. Whenever you are developing the system as part of this, these kinds of prototypes will actually help.

Usability Principles: Layout & Content Awareness

So, from this one there are five major Usability Principles which I would like to quickly mention, but with this we will complete this portion and then we will now move towards HTML as such. So, we will take a short break and then we will go through these five major aspects. We have already briefly touched them in the previous lectures, but this is a little bit more elaborate discussion as part of it because this is very critical for you when you start building the HTML prototype. Thank you very much.