Usability Engineering
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Module - 11
Lecture - 35
Usability Heuristics and Testing

Welcome to module 11 lecture number 35. We are at the fag end of this course; this is the module after which there is only one module left before we complete this course. Now in this session or rather in this module we are going to discuss about Usability Heuristics and Testing.

Usability heuristics plays a major role in audit of interfaces by experts. It provides a very fast and accurate way of finding the errors, finding the issues that may frustrate your users and leads to better design of interfaces. We would discuss about this in detail in this session, we are also going to discuss about usability testing, the initial foundational aspects of usability testing, followed by a detailed discussion on usability testing and the experimental protocols in our subsequent module which would be the last module for this course.

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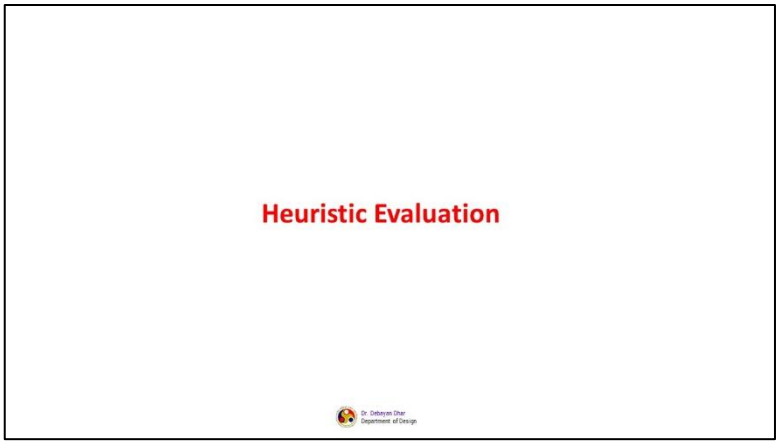

So, let us begin.

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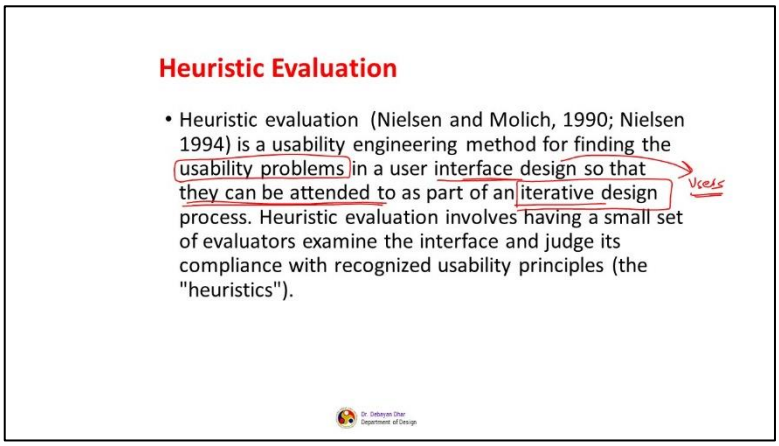

Now what is heuristic evaluation? You know heuristic evaluation was proposed by Jakob Nielsen and Molich in 1990 and further being improved by Nielsen in 1994. Now it is a usability engineering method for finding the usability problems in a user interface design. So, that they can be attended to as a part of an iterative design process.

Now, heuristic evaluation involves having a small set of evaluators examine the interface and judge its compliance, with recognized usability principles which are called as heuristics. Now I would like to draw your attention here on the discussions that we had in during the earlier modules in this course, that we know that the user centered design process is iterative in nature focus on this aspect.

Now, having being said this what is important for us to comprehend here is that the focus is on identification of usability problems. So, that a modified user interface design can be presented to whom to your users. And these activities are carried out are all part of your user centered design approach, when you have you know a concept which has been detailed out evaluated you have the wireframes done, you have the prototyping ready and then you go for identification of the usability issues. At this stage we are referring to conducting a heuristic evaluation.

If you see here the focus is on attending the usability issues that might exist in the interface, due to some erroneous decisions whatever it may be, but the important aspect here is that it needs to be attended. So, that when the beta release phase happens when the product is initially released in the market, these usability errors or issues can be addressed or rather

we can say that the product gets released only when, these issues which might have occurred during the conceptualization have been addressed.

And therefore, we say that it is iterative because what you do is that once you go for a heuristic evaluation, say if you identify issues you again come back to the stage where you start focusing on the concept, redefining your wireframes, focusing on your prototype and therefore, we say that it is a iterative design process.

So, what we do here is we involve a small set of evaluators who examine the interface based on some usability principles. We are going to discuss about these principles in this session in detail.

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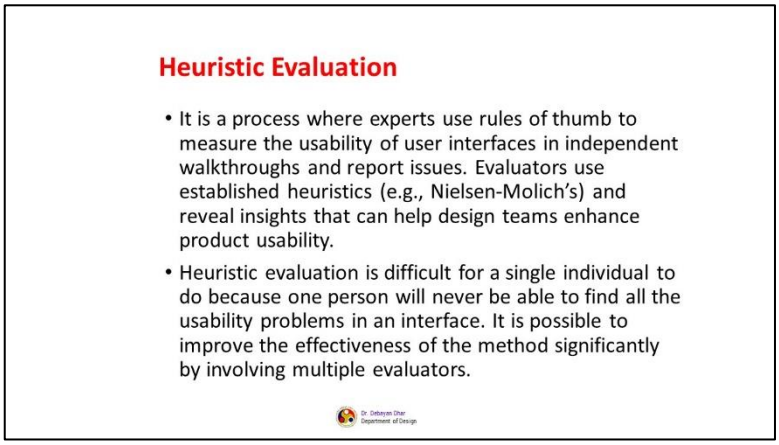

Now, it is a process. So, heuristic evaluation is a process wherein usability experts now I am using the term as expert these are not simple designers of any specialization or even any person doing it no. These are people who are aware of the usability heuristics and therefore, we call them as experts.

So, when experts use rules of thumb to measure the usability of user interfaces, in independent walkthroughs. We have discussed in detail about cognitive walkthroughs, so your experts are supposed to conduct walk throughs. And they use the rules of thumb or the heuristics to evaluate or identify the issues and then report those issues to the team.

So, evaluators while going through the while conducting an walk through uses established heuristics like the Nielsen's and Molich heuristics that we refer to as Nielsen's heuristics. And they reveal insights that can help the design team enhance product usability.

Now, heuristic evaluation is very very difficult if the focus is only on one evaluate. If you ask only one evaluator to or one expert rather to conduct a heuristic evaluation it is going to be difficult because, it is not possible for one person to identify all the problems that might exist in your interface.

And therefore, it is a practice that you at least call four to five experts, different experts, having experiences in working in different domain projects in projects from different domains. And therefore, they have perspectives which does not match with each other, so it its kind of heterogeneous group these experts you call at least four or five experts and then ask them to go for a walk through and use the heuristics to identify the issues with their interface.

Now, if you use this approach then probably it is possible that the effectiveness of this heuristic evaluation method improves a lot, whenever you use this kind of multiple evaluators instead of only doing one evaluator-based evaluation.

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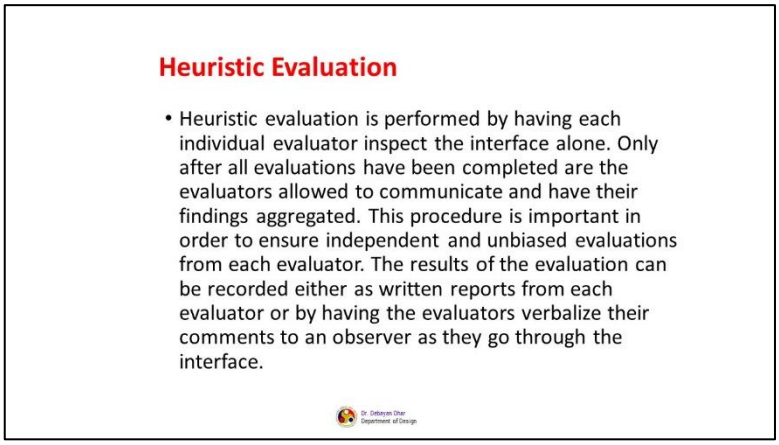

Now, heuristic evaluation is performed by having each individual evaluator inspect the interface alone, only after all evaluations have been completed are the evaluators allowed to communicate and have their findings aggregated.

Now, this procedure is important in order to ensure independent and unbiased evaluations from each evaluator. The results of the evaluation can be recorded either as written reports from each of the evaluator or by having the evaluators, verbalize their comments to an observer as they go through the interface. For you to note here is that if you have evaluators

placed in a common space or work in tandem, while they are doing the walkthrough the verbalizations, the discussions, might influence each other.

So, it is ideal that you have the walkthroughs done individually by each evaluator that you can record their insights if you can ask them to record or you can have one person who is observing to record for them. So, that when they verbalize things get recorded and later when you have all the evaluators at a particular space you can ask them to collaborate discuss and debate on the issues that you have figured out.

In that sense when these kind of discussions and debates are encouraged more or so what you will see is that issues that are probably much trivial, are gradually neglected over issues which are more more important. And all these are done in relation to the heuristics in relation to the way the heuristics are being interpreted by these evaluators.

So, therefore, again I am repeat I am repeating the statement that for you to conduct a heuristic evaluation. It is important that you identify an expert who has extensive experience in conducting heuristic evaluation, at the same time is aware of how to interpret the heuristics based on the context that is being provided to the person.

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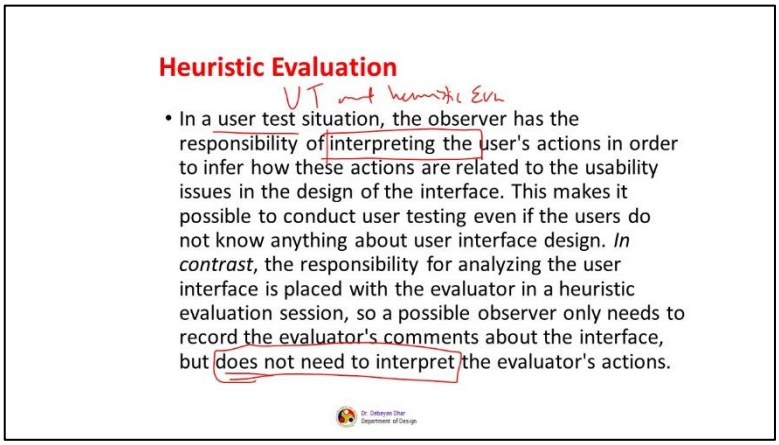

Now, let us understand how heuristic evaluation is different from user testing; many a time people say that ok. I have seen in many projects they ask people they ask their representative users to conduct a to have a walk through the concepts and then they ask for issues and they present that result as the findings of the heuristic evaluation is that correct.

The question is can you allow your users to behave as experts and then whatever issues you identify with them represent those insights as findings for heuristic evaluation, can you do that? For that we need to understand the user test situation or the user testing scenario.

Now, in a user test situation the observer has the responsibility of interpreting the users actions in order to infer how these actions are related to the usability issues in the design of the interface. So, this makes it possible to conduct user testing even if the users do not know anything about user interface design. Now if you look at heuristic evaluation in contrast to user testing the responsibility for analyzing the user interface is placed with the evaluator in a heuristic evaluation session.

So, a possible observer only needs to record the evaluators comments about the interface, but does not need to interpret the evaluators actions. The primary difference across user testing which we often refer to as UTs and heuristics heuristic evaluation is this. The activities of the user needs interpretation, while the activities of the expert does not need interpretation. This is the major difference between a user testing and heuristic evaluation.

See heuristic evaluation is always done by experts and these experts evaluate your interface or will rather I can say will evaluate your interface while they are having a walkthrough of the concept based on and only based on the heuristics that we are going to discuss about.

In contrast the user who is absolutely has no idea about heuristics who has absolutely no idea about user interface design guidelines or process that person your user is going to evaluate or verbalize his experiences based on his or her own expectations that is the difference between user testing and heuristic evaluations.

Now, to interpret why he is experiencing what he is experiencing we need to have the observer who is observing the situation of UT to interpret the observations of the user. And he or she interprets the observation of the participant user from the perspective of a user interface design guidelines. That absolutely is not required when you are working with experts in heuristic evaluation sessions, that is the primary difference between a UT and a heuristic evaluation.

So, you must understand this difference, so that clearly when I when you are working with users you realize what is the essence of working with users. Because you need to interpret

their experiences, their insight from the perspectives of UI design guidelines. While you are not supposed to essentially you are not supposed to do that, while you are working with the evaluators, because they actually are referring to the guidelines which they are pretty much aware of and giving you the violations that your interface design has made.

So, from this we understand that UT user testing and heuristic evaluation are completely different domains. One cannot be compared with the other based on these scenarios.

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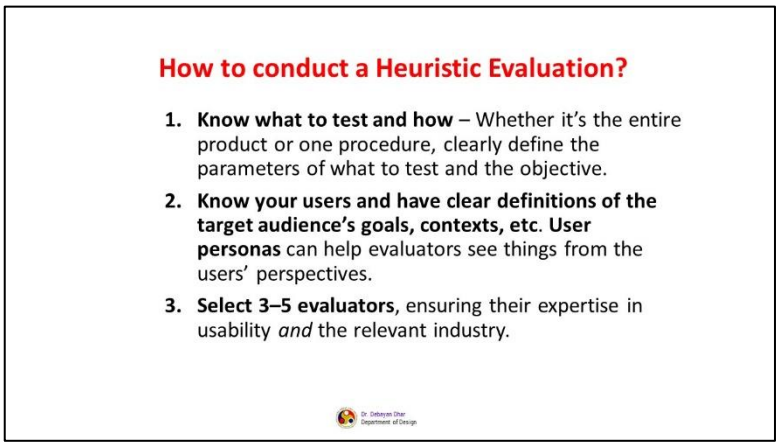

Now let us understand how to conduct a heuristic evaluation, the first and foremost part that you need to understand is you should know what to test and how. Whether it is the entire product; that means, the entire concept that you have thought about or it is just one activity or one task or one procedure that you want to test. You need to clearly define the parameters of what to test and the objective of the test.

Second know your users and have clear definitions of the target audiences' goals context etcetera. Now user personas here can help evaluators see things from the user perspectives. Now you must understand that while we will discuss the heuristics these heuristics is contingent on the persona or the scenario based on which the interpretation is made.

So, your experts must be aware of the persona, must be aware of the scenario. Because it is from that perspective that they are going to use the heuristics and evaluate your UI design. So, it is pretty important for you to inform your experts and evaluators about the persona and the scenario based on which your concept is being delivered.

Third identify around three to five expert evaluators ensuring that their experience and usability and the relevant industry are sufficient for them for you to gather deep insights about your UI design.

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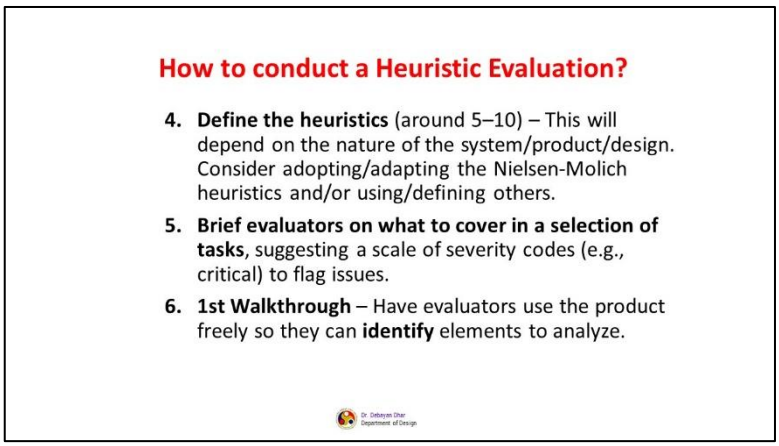

Fourth define the heuristics. Now it might happen that you are focusing on a very highly customized product it can be a b 2 c product it can be a fintech product.

Now, Nielsen's heuristics are generic in nature, a lot of research has been done lately. And then variations of Nielsen's heuristics have been defined for specific fields, you might like to use those specific heuristics that depends on the nature of the system, nature of the product and the nature of the design. Based on this you consider whether you are going to adopt all the heuristics or you adopt very specific set of heuristics based on the nature of the context that has been designed for.

Fifth, brief evaluators on what to cover in the selection of tasks. Now this means that suggesting a scale of severity codes to flag the issues how much severe a particular violation is according to the expert that tells a lot about the issues that the interface guideline is being currently plagued with. Sixth, first walk through have evaluators use the product freely. So, that they can identify elements to analyze.

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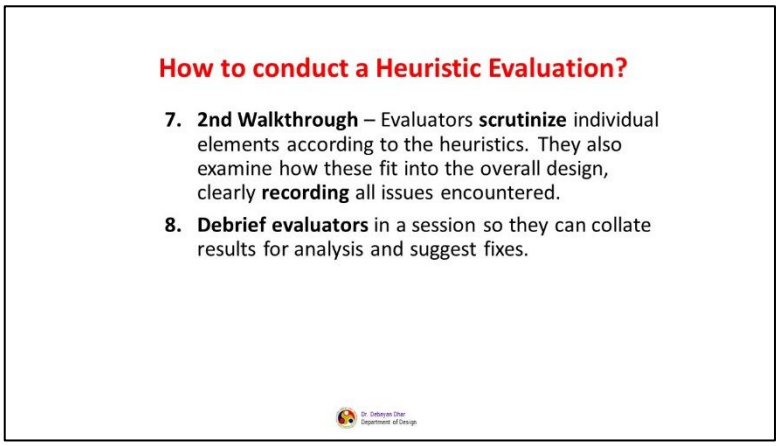

Then consider the second walkthrough evaluators, scrutinize individual element. According to the heuristics they also examine how these fit into the overall design clearly recording all issues encountered, that is part of the second walkthrough.

And finally, you are supposed to debrief your evaluators in a session, so that they can collate results for analysis and suggest fixes. Now at this stage you can also debrief them that there would be an observer who would be there for recording their verbalizations both approaches are acceptable in heuristic evaluation format.

Now, we are going to discuss about the heuristics based on which evaluators evaluate UI design and identify and flag the violators the serious issues in your concept.

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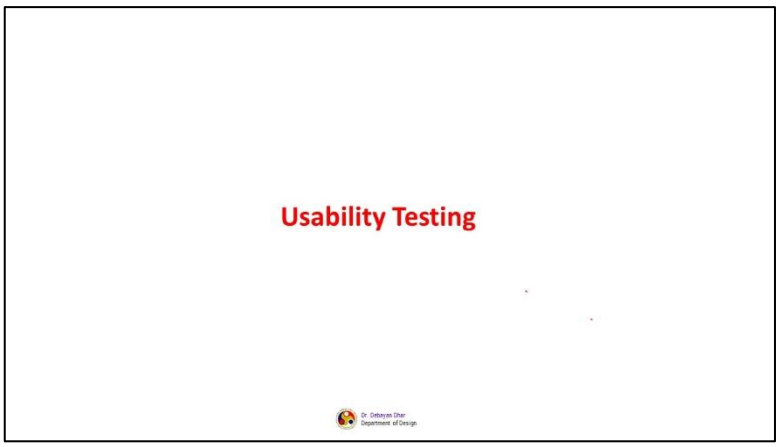

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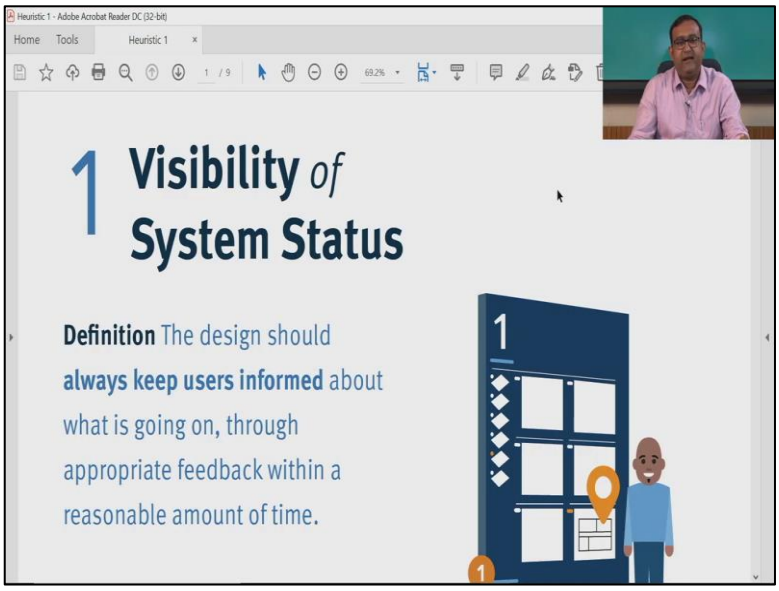

Let us discuss about the heuristics in detail. Now the first heuristic that have been provided to us by Nielsen's and Molich is about visibility of system status. Now what does it mean? It means that the design should always keep users your representative users informed about what is going on through appropriate feedback within a reasonable amount of time.

See first of all consider that if you are in a particular location if you are travelling to a particular location. You always look at the surroundings to at least have an idea about the space and the geography, so that you can create a map inside you for navigation. Now that is how generally people navigate and search for location.

Similarly, in the case of when a person is interacting with a web page or a software he also needs to understand where he is located. Where he is currently unless he understands his local position he would not be able to move from point a to point b because everything depends on him interpreting the current situation.

So, the first heuristics allows us to understand whether the system status where I am currently at what state the system is in, do I have that information as a user from the interface that have been presented to me. So, therefore, as a designer you must focus on designing those micro interaction aspects that we have discussed earlier you must ensure that appropriate feedback is being provided to your user.

So, that these heuristics are not violated the heuristics of understanding the state of the system, keeping the users informed about what is going on where I am currently this is called the state, status of the system what is happening currently. If you understand the current situation you can predict the next aspect, this is the principle based on which this first heuristics focuses on.

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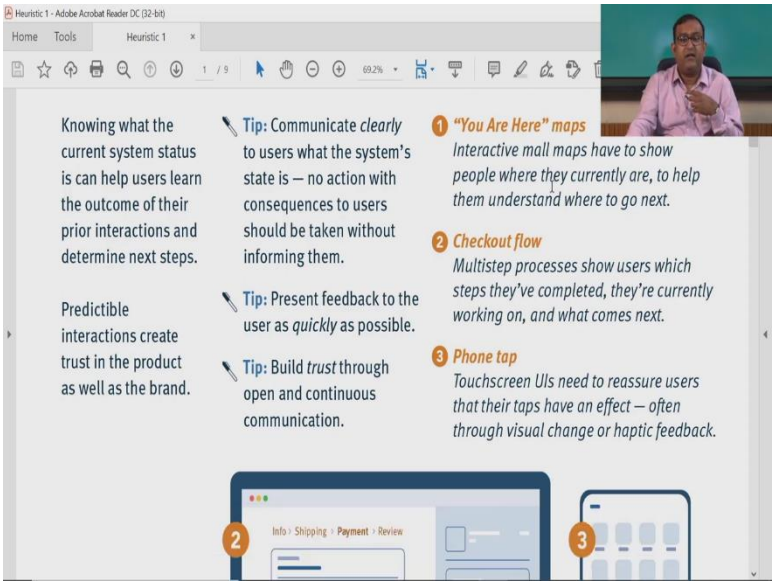

Now, what we understand from this is that knowing what the current system status is can help users learn the outcome of their prior interactions and determine the next steps. This is called planning because your users plan. Now, predictable interactions create trust is a very important factor, for you to have because that would ensure that you can create a loyal customer base. In the product as well as in the brand.

Now some of the useful tips that you can focus on here, is that communicate clearly to users what the system state is no action with consequences to users should be taken without informing them, present feedback to the user as quickly as possible once an activity is being performed, build trust through open and continuous communication.

Some of the example are you are here on the map you can see very nicely designed map say that you are here. So, interactive map have to show people where they currently are to help them understand where to go next this is about planning their next interactions.

Checkout flow, multi-step processor shows users which steps they have completed they are currently working on which and what comes next you know this is the state of the system. Phone tap, touch screen user interfaces need to reassure users that their tabs have an effect often through visual change or haptic feedback what whenever you touch there is a response there is a vibratory feedback there is a sound.

Now, these are all ways to provide ensuring messages that the system is being responding based on the input that the users are giving. And that allows the users to understand the status of the system which would be eventually useful for being for them plan from where they have come what currently where they are and where they can move on right.

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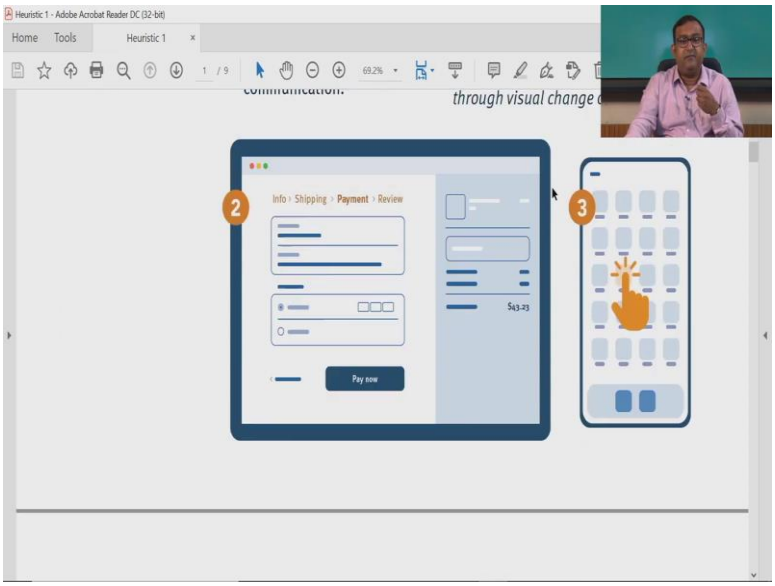

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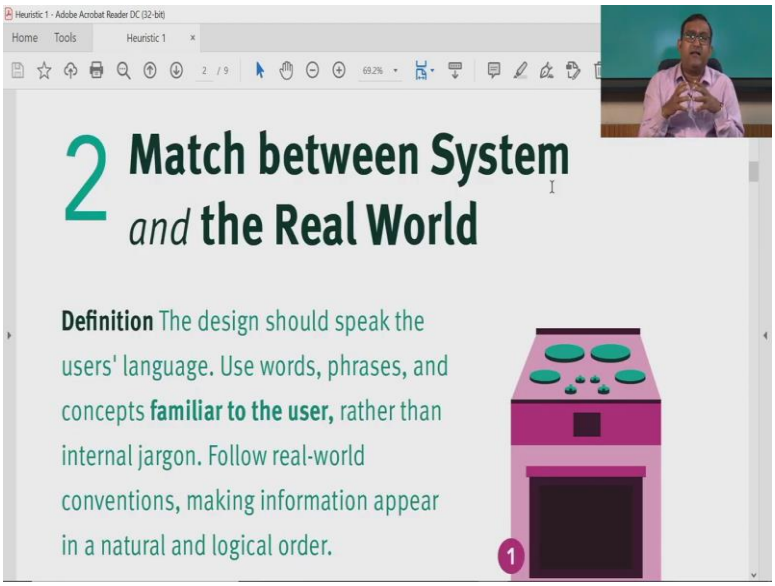

The second important heuristics is about match between the system and the real world. Now we have many a time we have discussed about this in detail during our initial lectures. You must understand the situation that how do we make sense of a particular thing, whenever we are confronted with the situation, whenever something new is being presented in front of us a new it can be a new product a new interface, how do we make sense out of it.

If you relate to the discussions that we have during cognition you will realize that we relate meaning of the present experience based on what we have stored from the past. That means, our past plays a major role for us to interpret the reality.

So, the design should speak the users language otherwise he would not be able to comprehend from his past. You must understand what cues have been stored in his memory, so that he can understand what is he being presented with. So, use words, use phrases and concepts familiar to the user, rather than internal jargon, follow up real world conventions, making information appear in a natural and logical order, that is obvious.

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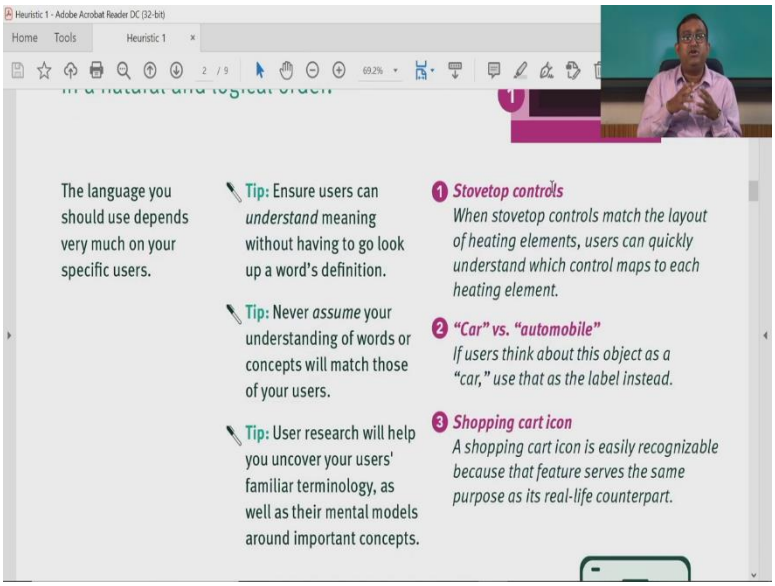

So, the language you should use depends very much on your specific, users some of the tips like ensure, users can understand meaning without having to go look up for a words definition. So, labelling has to be done in a way that is relatable with their experience and with their memory.

Never assume your understanding of words or concepts will match those of your users user research will help you uncover your users familiar terminology that is what you can do in user study would know the terminologies you know the abbreviations you know the local terms that these people speak they relate with.

And that essentially means that you actually understand their mental models around this important concepts ok some of the examples like stove top controls. So, when stove top controls match the layout of heating elements users can quickly understand which control maps which control maps to each heating element right. Where we have we are actually discussing about the controls of your stove by just interacting initially you understand what you are controlling with which one controls what car versus automobile.

Now, if users thinks about this object as a car use that as the label instead right the icon of car do they understand this as a car or do they relate this with an automobile with the word the label right. We are more familiar with the word car than the word automobile.

Shopping cart icon, so shopping cart icon is easily recognizable because that feature serves the same purpose as its real life counterpart, these are some of the examples that let us understand about the second heuristics which is about match between system and the real world.

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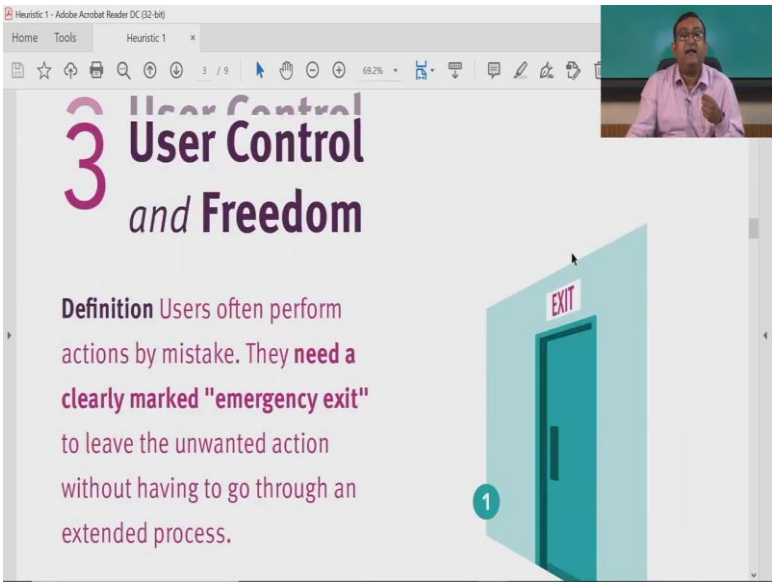

The third one is about user control and freedom. Now users often perform actions by mistake they need a clearly marked exit to leave that unwanted state or action without having to go through an extended process. And when does it happen this often happens when there is a gap between the mental model of the user and the conceptual model of the product.

And that is what we call it as golf of execution. If you remember the one that we have discussed in our last modules. The more amount of golf the user has to take there is high possibility or chance that he is going to commit an error.

Now, it is; obviously, almost impossible to design a flawless and completely error free system, but then the focus should be that even if the user encounters an error how does you provide him with support. So, that he can come out of the situation without being getting distressed right.

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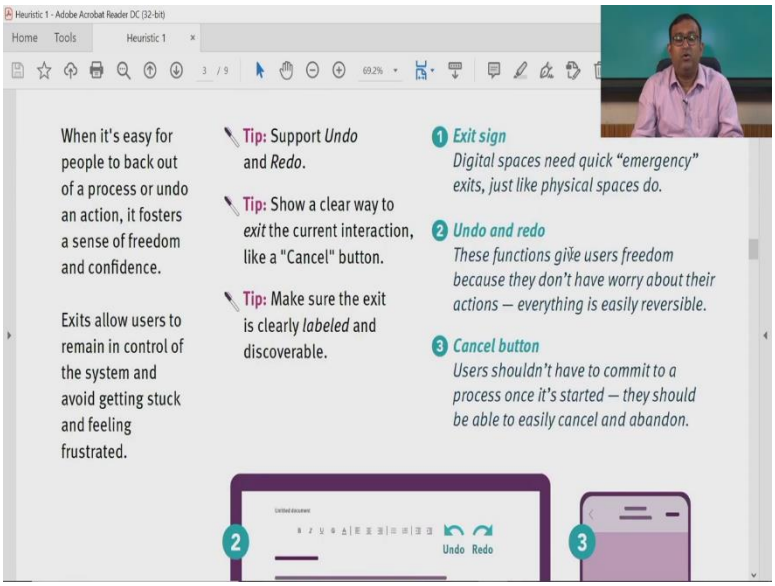

So, when it is easy for people to back out of a process or undo an action. It fosters a sense of freedom and confidence and it is at that moment there is a strong bond between the brand or the product and the user. Exits, allow users to remain in control of the system and avoid getting stuck and feeling frustrated. Some of the tips are support undo and redo.

Show a clear way to exit the current interaction, like a cancel button make sure that the exit is clearly labelled and discoverable. Some of the examples that we see currently are these exit sign. So, digital page spaces need quick emergency exits just like physical spaces do see. Now we are trying to match between the real world and the system, undo and redo cancel button these are some of the examples.

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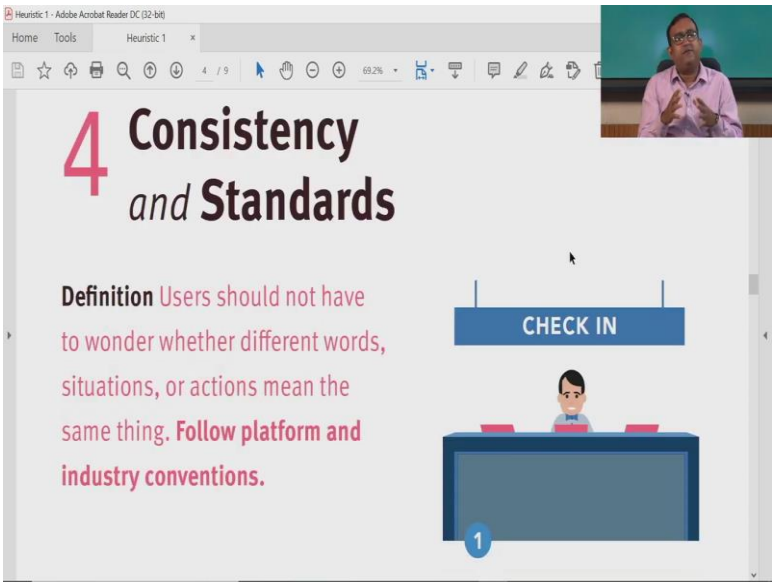

Let us now focus on the fourth heuristic consistency and standards. Now, users should not have to wonder whether different words situations or actions mean the same thing follow platform and industry conventions. See the standards that we follow in interface design are governed by worldwide consortium guidelines and these guidelines allows a clearly, defined structure of how an interface needs to be designed. This has also been imbibed in the material design layout that we have discussed in the last module.

Now, if you remember why it is important if you understand the situation you would follow this consistency and standards throughout your design as well. Why it is important, consider a situation like this. You have around 20 applications and just the search option or the search bar is in different places across the different applications. And therefore, for each application you open up you need to figure out where the search bar is by an enormous amount of activity by clicking this by clicking that.

Now, instead of this situation if you have the search bar across the all the 20 applications at the same location it makes the life of your user much easier. Because these are some of the global call to action features, which can be defined or placed in a way that is consistent throughout the entire gamut of android or iOS platforms.

Now, this is what we call as consistency as well as the way through which standards govern design of interfaces. Now when we talk about standards you must realize that each application and each product cater to different areas and context. Some products can be

educational products, some products can be fintechs, some products can be software as a service provider anything.

And each of these domains has their unique functions unique features that caters to those domains only. These are also classified as something which is governing that specific standard or the specific context of the group. And you must follow this, if you are designing a fintech application and you are following the principles of a social networking site then it might not help. Because your users are trained to look at these applications from a particular perspective because of your competitors who are following these standards across the industry.

Similarly, while you design independent UIs of your application if those UIs are not consistent in terms of layout in terms of text incept in terms of grid, then the user will not be able to relate each of these interfaces with the overall product or with the brand that you are being associated with. Therefore, it is important that you must follow platform and industry conventions.

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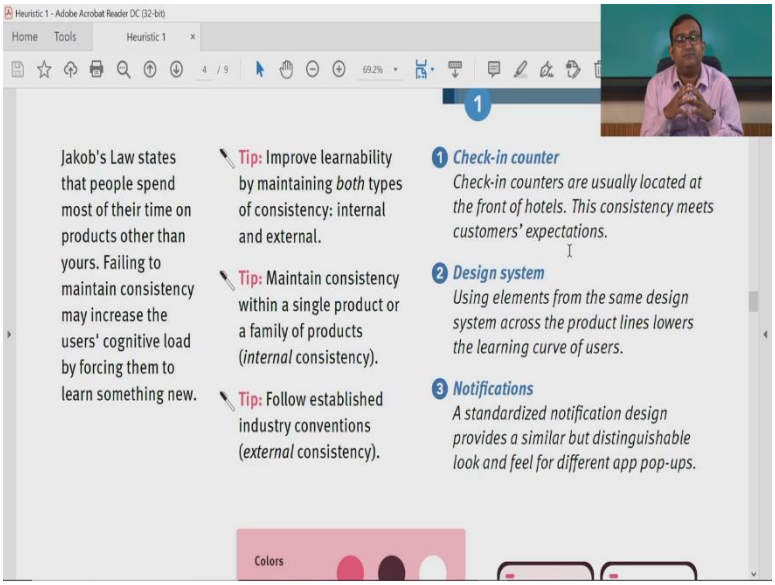

So, Jakob Nielsens law states that people spend most of the time on products other than yours. So, failing to maintain consistency may increase the user's cognitive load by forcing them to learn something new.

Now, this is the situation we are trying to avoid. So, what are the tips the tips are improve learnability, by maintaining both types of consistency internal and external, maintain consistency within a single product or family of products. For example, you have cars of a particular brand having consistency in terms of the design elements and cues that are being reflected across all their brands all their product line ups.

Then follow establish industry conventions now examples are check in counter a check in counters are usually located at the front of hotels. Now this consistency meets customers expectations. Now what will happen if you enter into a hotel and you start figuring out the check in counter, because it is not located in front rather it is located in some other location what will happen.

Design systems, using elements from the same design system across the product lines lowers the learning curve of user's notifications a standardized notification design provides a similar, but distinguishable look and feel for different app pop-ups.