Software Engineering
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Usability goals

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Recap

- Importance of designing "good" user interfaces

Goals + principles required to design "usable" interfaces

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In the previous video, we looked at the importance of designing good user interfaces. The user interface should realize the requirements provided by the user. But it is also important that the interface is usable. In this video, we will be looking at what are certain goals and principles required to design usable interfaces.

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So, what does usability mean? Usability is an ISO standard, and it is defined as the extent to which a product can be used by specified users to achieve specified goals. And the following are the key usability goals, such as effectiveness, efficiency, safe to use, learnability and memorability. We will look at each one in detail.

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The first usability goal is effectiveness. And this is a general goal, which describes how good a system is at doing what it is supposed to do. So, is the system capable of, let us say allowing people to learn well, if it is a learning system, or helps people carry out their work

efficiently, access the information they need, buy the goods they want, etc? And such effective systems are there all around us.

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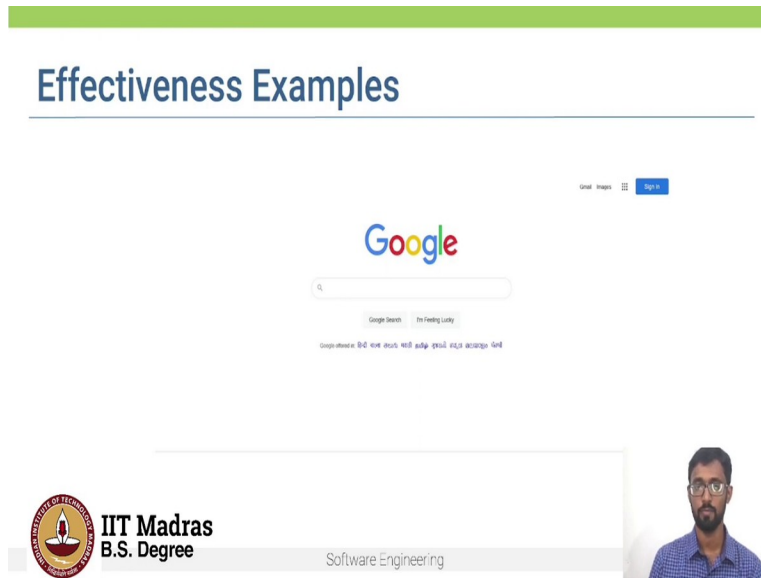
So, let us look at some examples. A common example of an effective user interface is Google. And I am sure all of you have used Google multiple times each day. Google has a minimal design. And if you notice the main functionality, which is the search is at the center.

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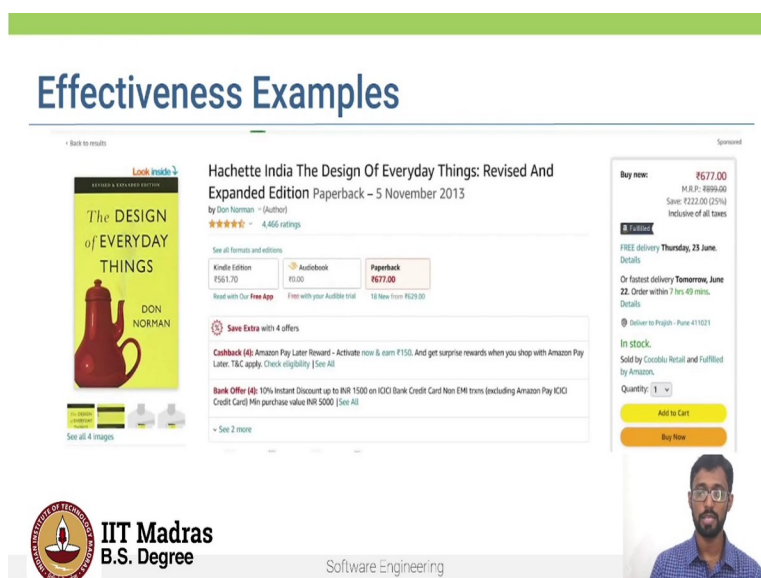
Amazon also has a very effective UI. So, all the necessary information is on a single page, such as the cost, when I get the product, offers, all of this is on a single page, and there is no need to scroll as well.

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Efficiency

- How does a system support users in carrying out their tasks

- Common tasks through a minimal number of steps

Now let us look at efficiency. So, efficiency is the way a system supports users in carrying out their tasks. It lets users carry out common tasks through a minimal number of steps. And let us say users have learned how to use a system can they sustain a high level of productivity using the system. Efficient user interfaces help users do that.

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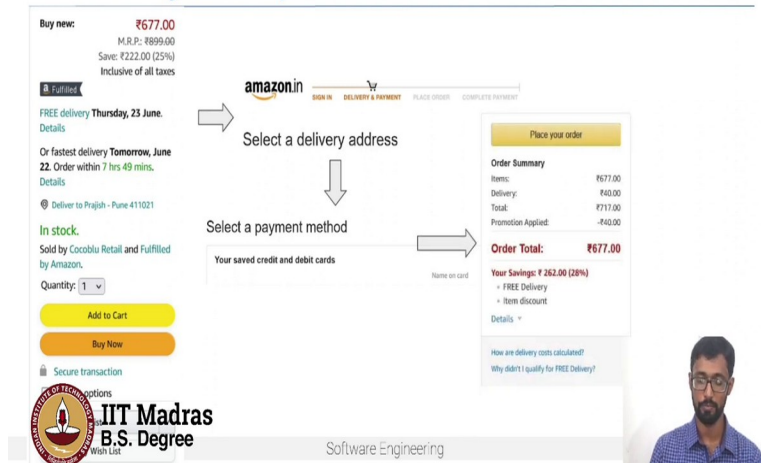
For example, let us say we want to buy a product at Amazon. So, how many clicks are required to buy an item at Amazon? So, you click on Buy Now first, then you select a delivery address, then you select the payment method, and then finally you can buy that. And

if you notice Amazon avoids repetitive tasks such as it helps us save the delivery address, save the card details so that users who come again and again can buy an item quickly.

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Safety

- Protecting the user from dangerous conditions and undesirable situations
- E.g. X ray machines, chemical plants

The next usability goal is safety. So, there are two aspects to safety. The first aspect is protecting the user from dangerous conditions and undesirable situation. For example, the user interfaces of X ray machines, chemical plants, they should be safe.

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Therac - 25
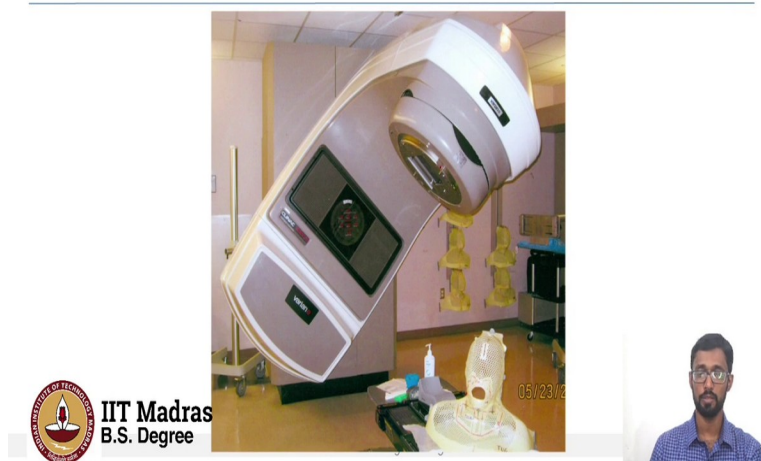
For example, Therac - 25 was a radiation therapy machine. It was a first of its kind, which had a dual treatment mode, and it use software-based safety systems rather than hardware controls. However, one day while treating a patient, the operator pressed X for the X ray

mode instead of E for the electron mode. And this led to excess radiation and the death of a patient.
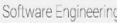
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However, most of us would not be using or designing such safety critical systems. And the second aspect of safety is helping users in any situation to avoid carrying out unwanted actions accidentally. So, these unwanted actions can be we press wrong keys by mistake or if we have made some errors, we should provide means of recovery to users. So, let us reflect on this question.

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So, most of you have used several software applications. So, recall certain software applications that you use. And are there ways in which 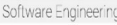these applications have helped you reduce the risk of wrong keys being pressed, or it provided a means of recovery if you made errors? Please pause this video and write down your responses before proceeding.
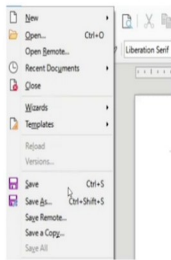
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So, the second aspect of safety is helping users in any situation to avoid carrying out unwanted actions. So, think about software applications, which have reduced the risk of wrong keys being pressed. Most common example is when you use documents systems. If you notice the save button and the close button are far apart.

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And if we look at if let us say this, we have made certain errors. There are several applications which provide a means of recovery as well. Examples of this are, let us say you accidentally deleted a file on Windows or any operating system, you can easily recover it from the trash. Let us say you are editing a document in Word, and the computer accidentally shut down. When you open Word the next time you are provided with recovery options. Control Z or undo is a common feature in most office software. And even in WhatsApp if you send a message by mistake, you can always delete a message.

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The next usability goal is learnability. Learnability refers to how easy a system is to learn to use. People usually do not like spending a long time learning how to use a system. They want to get started right away and carry out tasks without much effort. So, common applications like Facebook, Instagram, WhatsApp. So, did you read a manual to use these systems? No, right? You will learn to undergo as you started using these systems. So, these are fine for simple systems. But what about complex systems where we have to perform complex tasks?

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Reflection Spot

But what about complex tasks?

What are ways in which you can help users learn how to use your system?

Please pause the video and written down your responses

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So, let us reflect on this for a moment. So, what are ways in which you can help users learn how to use a complex system. Please pause the video and write down your responses before proceeding. So, there are several ways in which you can make your system more learnable.

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Learnability - Complex Tasks

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One way is to use wizards. Wizards are a step by step process of achieving a task, it breaks down a complex task into simpler task.

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Another way is to use a tour. So, tours on the web page can be used where there are lots of information or features on a single web page. And the tour highlights important areas or features of the page for new learners.

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Next is templates, so, templates provide defaults or structure based on the specific type of tasks. So, let us say you want to make a resume. The resume template can help you do or create resumes fast. So, in these cases, you do not have to start from scratch, but can use a template and start using the system.

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Memorability

How easy a system is to remember how to use, once learned

Another important usability goal is memorability. Memorability refers to how easy a system is to remember how to use once learned. This is especially important for interactive systems that are used in frequent. So, let us say use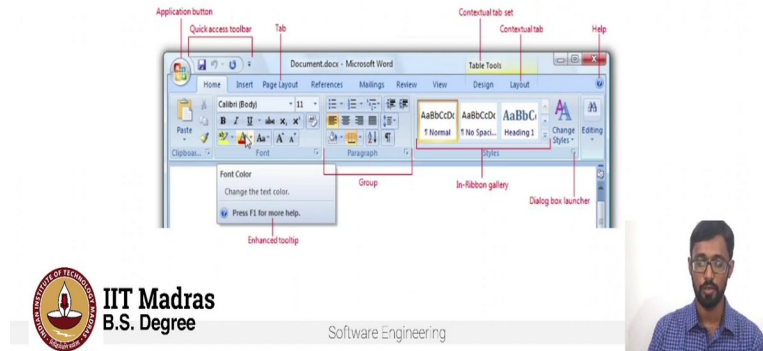rs have not used a system for a few months or even longer, they should be able to remember how to use it. So, they should not have to keep relearning how to carry out tasks.

A good example of memorable system is a Microsoft Word. So, there are meaningful icons, command names, menu options, all of these help users remember where to look to find a particular tool to a given stage of a task.

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User Experience Goals

- Want users to experience positive emotions while using the software
- E.g. - satisfying, enjoyable, fun, helpful, entertaining, helpful, motivating, emotionally fulfilling etc.
- More subjective
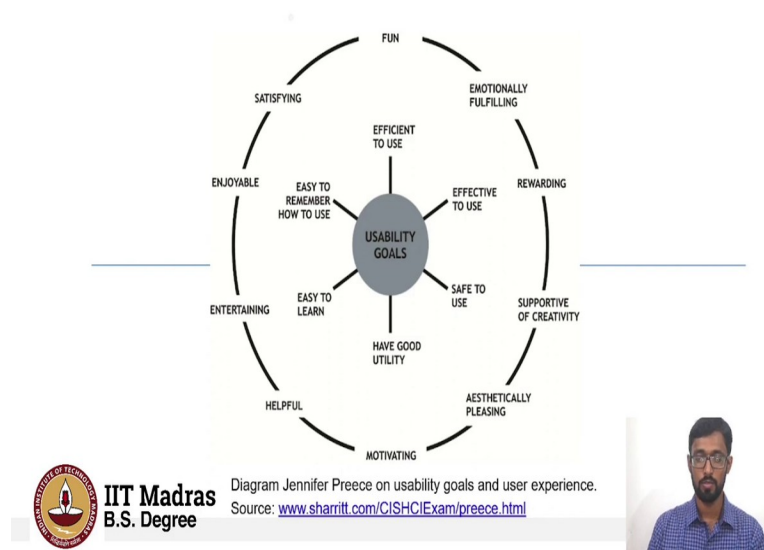- How users experience a product from their perspective

So, the usability goals, which we described earlier, are central while designing interactive systems. But apart from this based on the type of software we are building, we also want to

make the user experience positive emotions while using the software. So, this can include making the user interface satisfying, enjoyable, fun, helpful, etc. And these are known as user experience goals.

So, they are more subjective, and they are concerned with how users experience and interact with the product from their perspective, rather than assessing how useful or productive a system is from its own perspective. So, these goals also have to be kept in mind while building interactive software products.

Diagram Jennifer Preece on usability goals and user experience.
Source: www.sharritt.com/CISHCIExam/preece.html

So, this diagram provides a good summary of what we discussed in this LET. We looked at usability goals such as effectiveness, efficiency, safety, learnability, and memorability. And then we also looked at user experience goals, which are subjective, positive experiences that the user should have while interacting with the software.

So, the next time you use a system that you really enjoyed, try to think about which usability and user experience goals were satisfied by the user interface. And I hope that these usability goals and user experience goals will be useful for you as you go about designing user interfaces for your projects.