

Transcript

Video: ICT Accessibility. Operation 1.

Series: Human-computer interaction: design for all and assistive products.

Universidad Nacional de Educación a Distancia (UNED).

Alejandro Rodríguez Ascaso

Hello, I am Alejandro Rodríguez Ascaso, lecturer at the Department of Artificial Intelligence at UNED.

This is the first of the videos we are dedicating to the operation of a system — that is, the characteristics a system must have to ensure that users are able to activate all its functions, to do so within a reasonable amount of time, to avoid the accidental activation of controls, to recover from any errors we may make, and, of course, to use the system efficiently.

Metro ticket machine voice navigation system (female)

Welcome to the voice navigation system.

Metro ticket machine voice navigation system (male)

To select 'Single ticket'... To select 'Combined Metro', touch the upper left part of the screen. To select 'Monthly pass', touch the upper right part of the screen. To select 'Other tickets', touch the lower left part of the screen. You have selected 'Monthly pass.'

Alejandro Rodríguez Ascaso

In this metro system, which allows us to buy a ticket, a touch screen and a voice navigation system are used. It is therefore useful for people with visual impairments.

There is a very close relationship between the operation of a system and the perception of the information it generates. Why? Because to operate a system, we first need to know where the controls are located, to know the state they are in...

Metro ticket machine voice navigation system (male)

To select 'Monthly pass', touch the upper right part of the screen.

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...and to perceive the feedback of the operation — that is, the confirmation that a command we have given to the system has indeed been carried out.

Metro ticket machine voice navigation system (male)

You have selected 'Monthly pass.'

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Of course, there is also a relationship between the operation of a system and comprehension, both of the output it produces and of its overall functioning.

Narrator

The user operates the computer using the keyboard.

Computer screen reader

User interfaces of a Digital Home. Underline. Test.

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Víctor can use the product completely without needing to use a mouse — firstly, because the software allows all its functions to be activated using only the keyboard. We can all experience this, for better or for worse, depending on the situation. For instance, when our mouse breaks down or becomes misconfigured, how many times has that happened? We then need to use the keyboard to access certain software functions.

In addition, Víctor can both perceive and input information into the computer perfectly. How does he manage it? Because he receives output information in the form of speech, which he can easily perceive, and to input information, he uses tactile markers on the keyboard that allow him to identify where the F, J, and 5 keys are. Moreover, because the keyboard follows a standard layout, he can infer where the other keys are, based on his prior knowledge of that standard arrangement.

Some users do not use touch directly, but instead use, for example, a pointer stick or head wand to operate the keyboard. Therefore, all functions must be accessible without requiring direct touch.

Some users also need there to be no obstacles preventing them from reaching or pressing all buttons.

Narrator

Felipe selects a web address in his browser. He does so by combining chin tapping with a scanning system that moves across the screen, the direction and speed of which he can control.

Alejandro Rodríguez Ascaso

Felipe uses a mouse emulator and a scanning device. This method allows him to operate the product without needing to perform simultaneous actions, apply strength or pressure, grasp or pinch, rotate his wrists, maintain physical contact, move with precision, or use his hands.

He can also adjust the speed and acceleration of the input devices — for example, the speed at which the scanning cursor moves — and access all the system's functions from his keyboard emulator with visual feedback.

We have all been frustrated by interactive telephone systems when trying to contact, for example, the customer service department of our mobile phone operator. It can be quite nerve-racking — sometimes because the menus are too complex, or because the system does not recognise our voice correctly.

For that reason, and to ensure that people with speech impairments can use these systems, they must offer an alternative input method — for example, by allowing the user to make selections using the telephone keypad tones.

Another interesting case is that of ICT devices designed differently for people who use only their right hand or only their left hand. The mouse is a good example. If a left-handed person tries to use a mouse configured by default for right-handed users, they will face difficulties. Therefore, it must be

possible to reconfigure the right and left button functions. ICT products must be operable with either the right or left hand.

It is increasingly common for systems to allow a computer to be switched on using a fingerprint, or to activate or deactivate an alarm system in an office in the same way. However, some people are unable to extend their hand or place their finger on a sensor. For this reason, biometric identification systems must offer alternatives for those who cannot use that function.

Narrator

Using a chin switch and a scanning system that moves vertically and horizontally across an on-screen keyboard, a person types letter by letter into a document that also includes a word prediction system.

Alejandro Rodríguez Ascaso

In this video, we have seen how Felipe enters text into the system through a virtual keyboard, a chin-operated mouse, and an on-screen keyboard. This is becoming increasingly common — for example, on mobile phones that now allow us to dictate search terms orally in Google. Therefore, it is important that systems offer alternative input methods for entering text.

For repetitive actions, it is often convenient to use keyboard shortcuts, though they can sometimes be difficult to remember. Another accessibility requirement is therefore to make these keyboard shortcuts visible and also accessible in a way that does not require pressing multiple keys at once.

Some time ago, when we still used public telephone booths, it was annoying to insert several coins, take too long to dial the number, and have the booth automatically return all the coins, forcing us to start over. Something similar happens with this metro ticket renewal system.

Visual information

A user tries to insert their metro card into the machine, but struggles to do so, taking longer than the expected time.

Metro ticket machine voice navigation system (male)

Operation cancelled.

Alejandro Rodríguez Ascaso

The user is taking a little longer to insert the monthly pass they wish to renew, so the system times out and restarts the process. Systems should give us enough time to complete our actions, or, in other words, they should offer an alternative mode to complete a function according to the user's time constraints. They should also give users sufficient time to read all the displayed information.

In conclusion, we have seen in this video the important relationship between system operation and the perception of the information it produces, as well as an understanding of how it works overall.

We have also looked at accessibility requirements related to operating all available functions in a reasonable amount of time. Other aspects of accessibility concerning system operation — such as avoiding accidental control activation, recovering from errors, and using a product efficiently — will be addressed in a future video.