

# Coding manual

Original article: Oulasvirta, A., Wahlström, M., & Ericsson, K.A. (2011). What does it mean to be good at using a mobile device? An investigation of three levels of intermediate experience and skill. *International Journal of Human-Computer Studies*.

## Behavioral categories

Category: Directly useful action

Explanation: Acting on a solution path. It should be considered that different equally short or optimal paths exist (see Appendix A of the paper).

Examples: Choosing 'WLAN scanning' in the WiFi connection task. Choosing 'calendar' in the calendar entry task.

Category: Using a shortcut

Explanation: Sub-category of the previous but using a shortcut key i.e. passing stages of the shortest 'step-by-step' path.

Examples: Long press of calendar key creating a meeting entry. Accessing the internet by pressing '0'.

Category: Physical exploration

Explanation: Exploring the smartphone in the hand

Example: Turning the phone in one's hand and looking different sides of it.

Category: Accidental button presses

Explanation: Pressing a button accompanied by pondering of what happened i.e. is interpreted not solely with visible actions but by taking individual's think-aloud speech into consideration.

Examples: Pressing any button and saying e.g. 'oops', 'where did I go now' or 'what happened'.

Category: Unintended button

Explanation: Trying to execute a command but pressing the wrong button i.e. there is a contradiction between individual's think-aloud speech and action.

Examples: Using to the 'joystick' to go left in the screen while saying that is going right. Choosing contacts while saying that is going to gallery.

Category: Deviation from an optimal path (choosing wrong application/folder)

Explanation: Executing an intended command of the device that does not lead forward in the optimal path (see Appendix A in the paper)

Examples: Saying out loud 'I will see what is in the gallery' while entering the gallery but entering the gallery does not lead forward in the path. Does not say anything and chooses application or folder that does not lead forward in the path.

Category: Unnecessary subtask

Explanation: Executing an entire procedure that is unnecessary for the task

Example: Used to the pairing of Bluetooth devices before sending a file.

## **Cognitive categories**

Category: Reporting an action

Explanation: Reporting what is currently being done-

Examples: 'I'll turn on Bluetooth.' 'I'll enter the gallery.' 'I will mark down a meeting.'

Category: Testing

Explanation: Reporting testing something i.e. any utterance with words 'testing', 'trying', 'experimenting' or such.

Examples: 'I will test if I can turn on the Bluetooth with this button.' 'I will try if I can find the calendar here.' 'Let's try if it is here.'

Category: Question

Explanation: Asking a question on the functioning or use of the smartphone.

Examples: 'Does this open the gallery?' 'Can I switch on the Bluetooth here?' 'Is it possible to access the internet with this button?'

Category: Uncertainty

Explanation: Explicitly stating uncertainty about what should be done; using words such as 'maybe' or 'perhaps'.

Examples: 'This will take me to the internet, perhaps.' 'I assume that I can find the audio recorder here.' 'Maybe this is the right folder.'

Category: Inferring the user interface

Explanation: Making an inference on symbols presented in the user interface.

Examples: 'That earth must be the Internet.' 'That note is the music player.' 'Messages are behind this envelope.'

Category: Technical explanations

Explanation: Explaining, by referring to technical features, why the phone is functioning in a certain way.

Examples: 'Now it works better due to a firmware update.' 'This takes time because of an old version of flash.' 'The lid opens loosely because the phone is old.'

Category: Specific functionality

Explanation: Explaining that the smartphone functions in a certain manner because it is a certain type.

Examples: 'This new phone has very useful shortcut keys.' 'This phone type has a camera button in the side.' 'As this is communicator, I can access the application here.'

Category: Anticipation or correct statement

Explanation: Making an explicit and correct statement on certain functionality of the phone.

Examples: 'The audio recorder is in the applications.' 'The camera will turn on automatically if I open the lens.' 'I can directly send the file via Bluetooth by choosing here.'

Category: Confidence

Explanation: Stating that doing something is, e.g., easy or familiar

Examples: 'Ok this is a task to do.' 'It is easy to use camera.' 'This I can do.'

Category: Recalling

Explanation: Referring to one's memory of things

Examples: 'I remember that the audio recorder can be found here.' 'According to my memory I can turn on the Bluetooth here.' 'I recall that I can open the camera like this.'

Category: Other devices

Explanation: Making reference to other (computer) devices.

Examples: 'My computer has a Bluetooth so I know what it is about.' 'I have done this with my computer.' 'I can toggle with camera and video mode also with my digital camera.'

Category: Wrong rule

Explanation: Explaining a rule of how the task should be done, but this rule is objectively wrong

Examples: 'First I have to pair these devices.' 'The audio recorder is in the devices.' 'I cannot access the Internet from the front screen.'