Cognitive Walkthrough + Think-Aloud User Testing

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What is Cognitive Walkthrough?

- A usability inspection method used to identify design issues in software interfaces
- Consists of a series of hypothetical tasks that are evaluated from the perspective of the user
- Focuses on identifying the cognitive processes involved in completing the tasks
- Requires evaluators to identify potential usability issues and make recommendations for improvement

Steps in Cognitive Walkthrough

- Define tasks: Identify critical tasks and user goals
- Create user profile: Develop a hypothetical user profile
- Analyze tasks: Evaluate each task step-by-step from the user's perspective
- Identify usability problems: Note issues that arise during the evaluation
- Provide recommendations: Make recommendations for improving the interface

What is Think-Aloud Testing?

- A user testing method in which participants verbalize their thoughts while performing tasks on an interface
- Helps researchers understand user decision-making processes and identify usability issues
- Participants are encouraged to speak aloud, describing what they see and think while completing tasks
- Researchers observe and take notes on participants' behaviors and feedback

Think-Aloud Testing Process

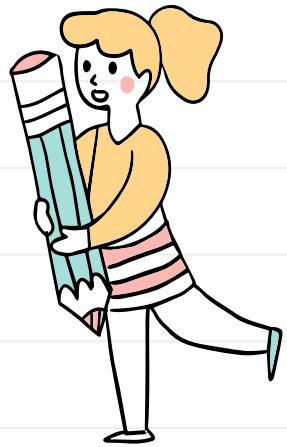
- Recruit participants: Identify target user group and recruit participants
- Define tasks: Develop a set of tasks for participants to complete
- Conduct the test: Observe and take notes on participants' verbalized thoughts and behaviors
- Analyze data: Analyze the collected data to identify usability issues and areas for improvement
- Provide recommendations: Make recommendations for improving the interface based on the data collected

Benefits of Cognitive Walkthrough and Think-Aloud Testing

- Identifies usability issues early in the design process
- Provides insight into users' decision-making processes
- Allows for the creation of user-centered designs
- Facilitates collaboration between designers and evaluators
- Improves the overall user experience and satisfaction

Enhancing User Experience through Empirical Evaluations

- Cognitive walkthrough and think-aloud testing are two important methods for improving the usability of software interfaces
- By identifying usability issues and understanding users' decision-making processes, designers can create user-centered designs that improve the overall user experience
- Empirical evaluations like these are crucial for ensuring that software interfaces are both effective and efficient.



https://www.youtube.com/watch?v=g34tOmyKaMM

Case Study of the Home-Care Ventilator

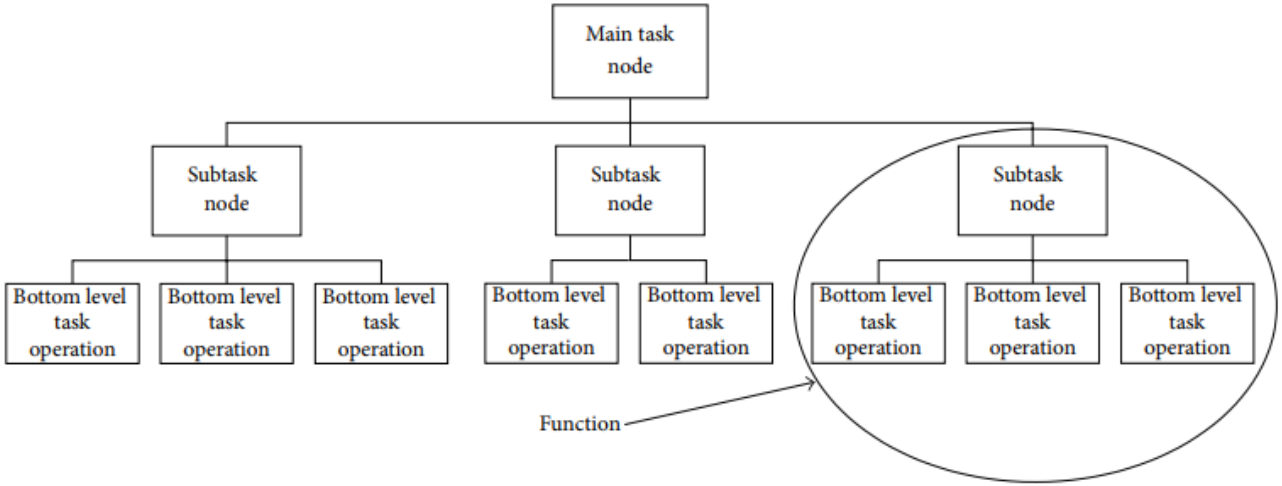


Figure 1: HTA diagram with nodes, operations and functions.

Case Study of the Home-Care Ventilator

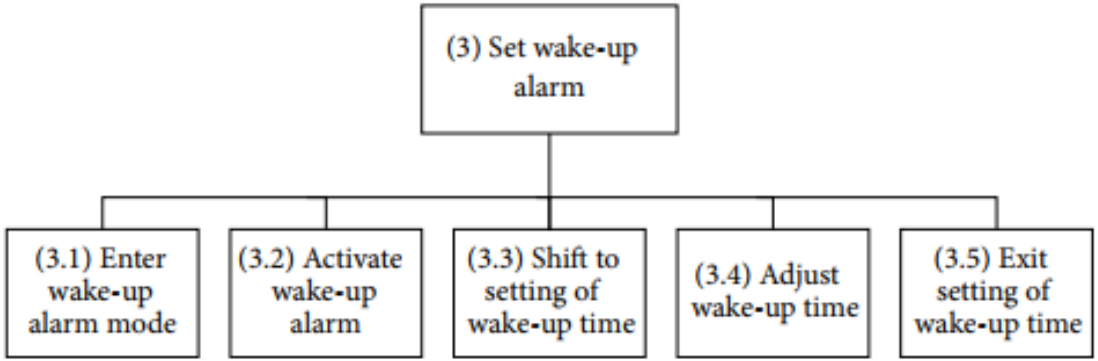


FIGURE 2: The correct handling sequence for the task "set wake-up alarm" presented in an HTA diagram.

Case Study of the Home-Care Ventilator

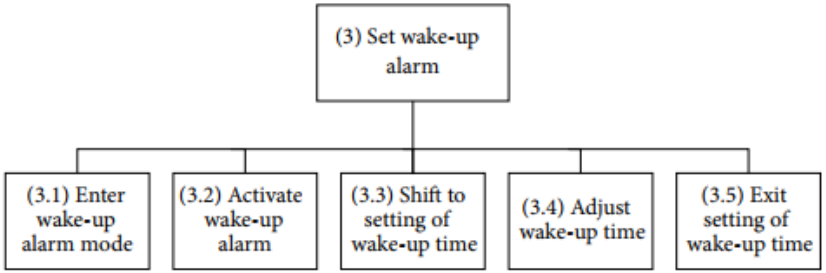


FIGURE 2: The correct handling sequence for the task "set wake-up alarm" presented in an HTA diagram.

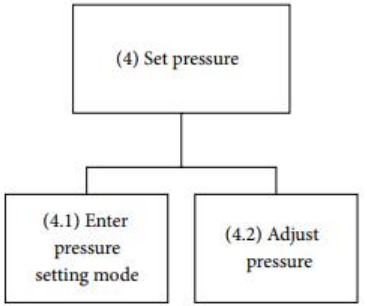


FIGURE 3: The correct handling sequence for the task "set pressure" presented in an HTA diagram.

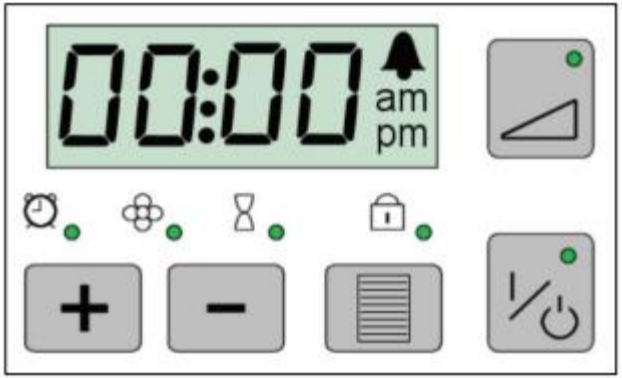


FIGURE 4: The user interface of the home-care ventilator.

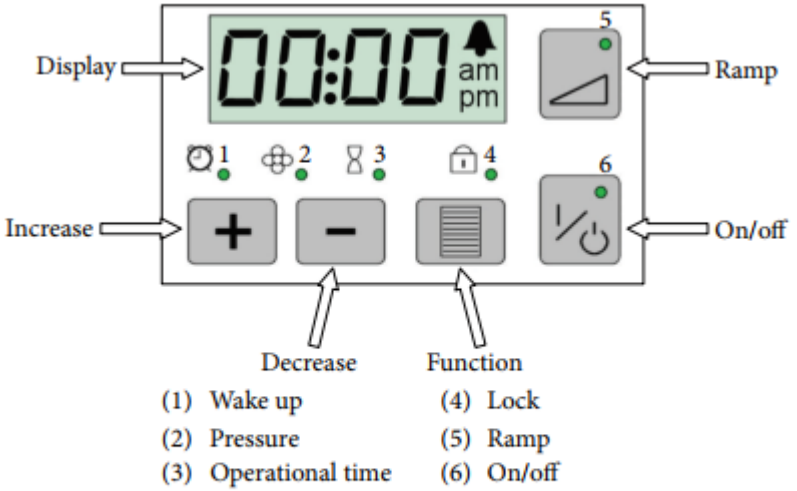
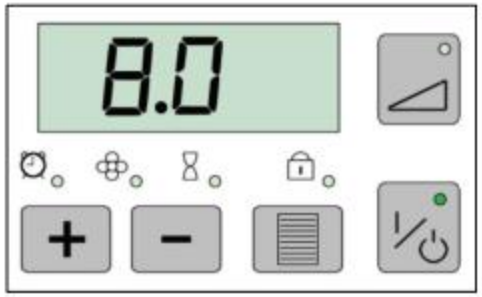
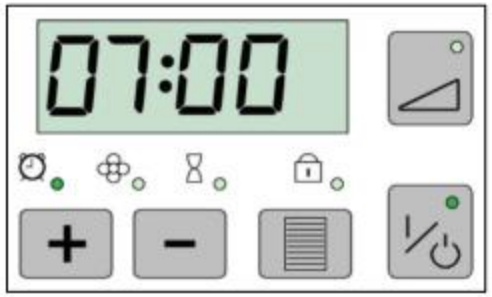


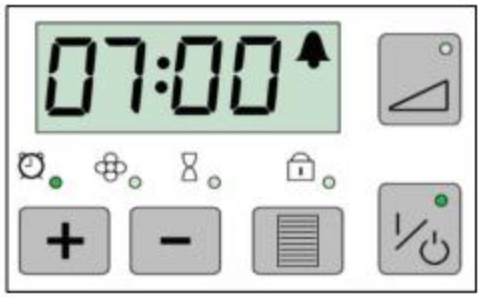
FIGURE 5: The user interface of the home-care ventilator with explanations.



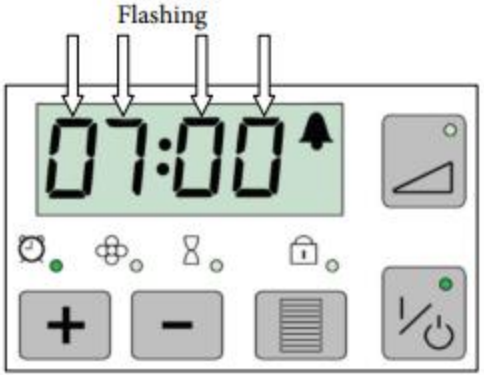
(a) Task/function 3.0: set wake-up alarms



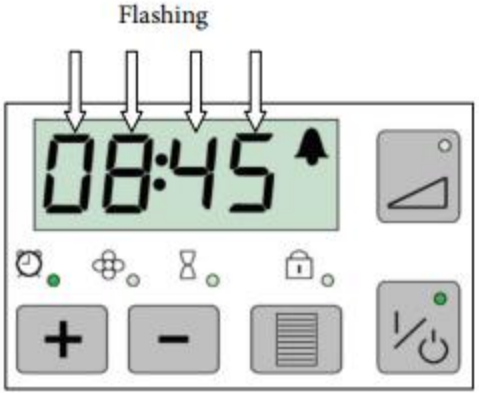
(b) User action to operation 3.1: press the function button once



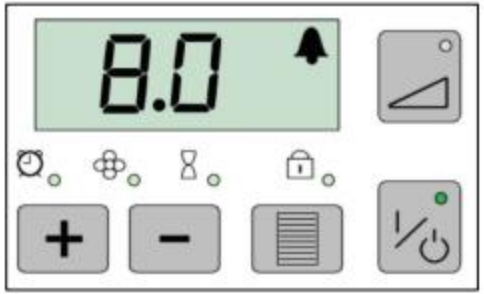
(c) User action to operation 3.2: press the increase button once



(d) User action to operation 3.3: press the function button once



(e) User action to operation 3.4: press increase or decrease buttons until the desired wake-up time is shown



(f) User action to operation 3.5: press the function button three times to exit setting of wake-up time

FIGURE 6: Performed user actions and the response of the user interface for the task "set wake-up alarm".

Table 2: Grading of the failure/success stories.

Grade	Grade in words	Explanation
5	Yes	A very good chance of success
4	Yes, probably	Probably successful
3	Do not know	Impossible to decide if success or not
2	No, uncertain	Small chance of success
1	No	A very small chance of success

Table 3: Examples of problem types.

Problem type	Explication	Origin
User (U)	The problem is due to the user's experience and knowledge, possibly because the user is accustomed to different equipment	Comes primarily from questions 1 and 3
Hidden (H)	The interface gives no indications that the function is available or how it should be used	Comes primarily from question 2
Text and icon (T)	Placement, appearance and content can easily be misinterpreted or not understood	Comes primarily from question 3
Sequence (S)	Functions and operations have to be performed in an unnatural sequence	Comes primarily from question 1
Physical demands (P)	The interface sets too high demands on users' physical speed, motoric skill and force	Comes primarily from question 4 (operation level)
Feedback (F)	The interface gives unclear indications of what the user is doing or has done	Comes primarily from question 4 (function level) and question 5

Table 4: The ECW analysis template.

(a)

3.0	Set wake-up alarm Failure/success story	Set wake-up alarm Usability problem	PS	PT
(1)	Do not know. It depends on whether the user has read the manual or has the expectation of being able to execute this setting.	User does not expect functionality	3	U
(2)	Yes, there is an icon with LED in the user interface.	No usability problem	5	—
(3)	Yes, probably. The icon has the appearance of a classic wake-up bell.	Unclear icon	4	T
(4)	Yes, the LED for wake-up alarm is lit.	No usability problem	5	—
(5)	Yes, the symbol for wake-up in the display appears or disappears.	No usability problem	5	—

(b)

3.1	Enter wake-up alarm mode	Press the function button once	PS	PT
(1)	Yes, probably. The users know that they have to enter a mode to be able to set the wake-up alarm.	User does not expect action	4	U
(2)	Yes. The function button is specifically marked and accessible.	No usability problem	5	—
(3)	Yes, probably. The function button is marked with a symbol for circular change, and the users can use the method of elimination.	The function button can be hard to interpret	4	T
(4)	Yes, the users have motoric precision and force to press the button.	No usability problem	5	—
(5)	Yes, the lit LEDs change and the wake-up time is shown in the display.	No usability problem	5	—

Table 1

Grading of the tasks performed by the home-care ventilator.

	Task	Grade
1	Start treatment	1
2	Set actual time	4
3	Set wake-up alarm	4
4	Set pressure	2
5	Adjustment of what to show in the display	3
6	Show software version	5
7	Show operating hours	4
8	Lock/unlock the panel	2
9	Use the ramp function	2
10	Turn off treatment	1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