Cognitive Walkthrough

Carried out by human factors or cognitive engineers, the cognitive walkthrough is a method that identifies misalignment between the UI design and the user cognition. There are generally two approaches to the cognitive walkthrough.  One approach focuses on understanding the system's learnability for new or infrequent users (effective for evaluating walk-up-and-use systems like websites or kiosks where users would have little or no training). The second approach focuses on assessing the extent to which the UI is designed to support cognitive processing and decision-making of end users performing complex tasks.

The cognitive walkthrough was originally designed as a tool to evaluate walk-up-and-use systems like postal kiosks, automated teller machines (ATMs), and interactive exhibits in museums where users would have little or no training. However, the cognitive walkthrough has been employed successfully with more complex systems like CAD software and software development tools to understand the first experience of new users.

 The cognitive walkthrough is a practical evaluation technique grounded in Lewis and Polson's CE+ theory of exploratory learning. The CE+ theory is an information- processing model of human cognition that describes human- computer interaction in terms four steps:

1. The user sets a goal to be accomplished with the system (for example, "check spelling of this document").
2. The user searches the interface for currently available actions (menu items, buttons, command-line inputs, etc.).
3. The user selects the action that seems likely to make progress toward the goal.
4. The user performs the selected action and evaluates the system's feedback for evidence that progress is being made toward the current goal.

For most realistic tasks that a user would attempt with a system, these four steps are repeated many times to achieve a series of sub-goals that define the complete task. The cognitive walkthrough examines each of the correct actions needed to accomplish a task, and evaluates whether the four cognitive steps will accurately lead to those actions.

 Empirical evidence is still not available to support the claim that CW is better suited to UI redesigns than Heuristic Evaluations, but this method does support he consideration of alternative UI approaches that HE does not support well.

**Benefits**

* May be done without first hand access to users.
* Unlike some usability inspection methods, takes explicit account of the user's task.
* Finds up to 40% of the usability problems that would be identified by user testing.
* Provides suggestions on how to improves learnability of the system.
* Can be applied during any phase of development.
* Is quick and inexpensive to apply if done in a streamlined form.

**Limitations**

* The value of the data is limited by the skills of the evaluators.
* Tends to yield a relatively superficial and narrow analysis that focuses on the words and graphics used on the screen.
* The method does not provide an estimate on the frequency or severity of identified problems.
* The method, like many usability inspection methods, tends to report known concerns and issues that don’t effect usability in actual use at a higher rate than task-based user testing.
* Following the method exactly as outlined in the research is labor intensive.

Groups of evaluators are needed to maximize the likelihood of success.

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| **​Milestone** | **​Owner** |
| ​Initiate Kick-off Call | ​HFE |
| Specify Study Objectives | ​Business Office |
| ​Specify Performance Metrics | ​Business Office |
| ​Create task list and an action sequence that details the task flow from beginning to end | ​Business Office |
| ​Provide system access or a representation of the system | ​Business Office​ |
| ​Recruit Evaluators | HFE |
| ​Conduct assessment | HFE |
| ​Analyze findings, write report | HFE |
| ​Conduct [**After Action Review**](https://vaww.portal2.va.gov/sites/humanfactors/SitePages/AAR%20Process.aspx) |  |

**Outcomes**

* A list of success or failure stories.
* Discussion of design implication of each failure story.

Recommended improvements to UI designs based on developer input.

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| **Phase of Development​** | |
| ​ | ​Planning, Scoping & Definition |
| ​ | ​Requirements Gathering |
| **✔** | **​Early Design** |
| **​✔** | **​Detailed Design & Development** |
| **​✔** | **​Field Testing** |
| ​ | ​Deployment |
| **​✔** | **​Post-Deployment** |

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| **Timeframe** | ​3-4 weeks |
| **​Level of Effort** | High |
| ​**Data Collection** | Behavioral |
| ​**Data Reporting** | Qualitative |

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| **​Related Methods ​** | |
| **Derived from** | ​Walkthroughs |
| **​Complimentary Methods** | [**Heuristic Evaluation**](https://vaww.portal2.va.gov/sites/humanfactors/HFBoK/SitePages/Heuristic%20Evaluation.aspx) |
| **​Similar Methods** | [**Pluralistic Usability Walkthrough**](https://vaww.portal2.va.gov/sites/humanfactors/HFBoK/SitePages/Pluralistic%20Usability%20Walkthrough.aspx) |
| **​Follow-Up** | ​[**Formative Usability Test**](https://vaww.portal2.va.gov/sites/humanfactors/HFBoK/SitePages/Formative%20Usability%20Test.aspx) |

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