A Survey of Heuristic Evaluation Tools

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Content

1. Usability Evaluation

Usability Evaluation

- Who does the evaluation?
  - Usability experts $\rightarrow$ Usability inspection.
  - Representative users $\rightarrow$ Usability testing.

- What is the purpose of the evaluation?
  - Find problems during implementation $\rightarrow$ Formative.
  - Assess quality after implementation $\rightarrow$ Summative.

Usability Evaluation Methods

	Inspection	Testing
Formative	Heuristic Evaluation, Cognitive Walkthrough	Thinking Aloud Test, Post-Test Interview
Summative	Guideline Scoring	Formal Experiment, A/B Test

2. Heuristic Evaluation

Heuristic Evaluation

- Described by Molich and Nielsen 1990.[1]
- 3–5 usability specialists.
- Small set of usability principles (*heuristics*).
- Supporting studies (number and experience of evaluators, coverage).
- Widely used across the industry.

[1] doi:10.1145/77481.77486

Heuristic Evaluation – Heuristics

Jakob Nielsen's 10 usability heuristics[1]:

- Visibility of System Status
- Match Between the System and the Real World
- User Control and Freedom
- Consistency and Standards
- Error Prevention
- Recognition Rather than Recall
- Flexibility and Efficiency of Use
- Aesthetic and Minimalist Design
- Help Users Recognise, Diagnose, and Recover from Errors
- Help and Documentation

[1] https://nngroup.com/articles/ten-usability-heuristics/

Heuristic Evaluation – Process

1. *Preparation*: Interface (implemented, mock-up), heuristics, domain training.
2. *Individual Evaluations*: 1–2h per evaluator, screen recording/camcorder, describe findings.
3. *Aggregation*: Manager collects findings, merges similar.
4. *Severity Ratings*: Impact of findings, individual, no discussion.
5. *Debriefing and Report*: Discussion, possible solutions, report.

Andrews 2025: https://courses.isds.tugraz.at/hci/hci.pdf

Heuristic Evaluation – Tools

Differentiation of tools:

- Manual (n=5): ‘Paper tools’, not processed programmatically.
- Installable (n=5): Locally installed and running, no communication with servers.
- Online (n=14): Running on a webserver (‘cloud services’), accessible through a browser.

Greyed out tools in upcoming lists are described in full survey paper.

3. Manual Tools

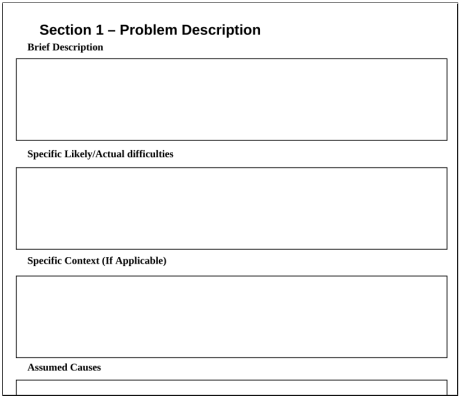
Manual Tools

- Extended Structured Report Format [2004]
- Morae [2004–2019]
- Axure [2014]
- Axis [2017]
- Heuristic Evaluation Workbook [2023]

Greyed out tools are only described in full survey paper.

Extended Structured Report Format (ESRF) [2004]

- Cockton et.al., University of Sunderland.[1]
- 3-page PDF/DOC.
- 4 parts: Problem description, likely/actual difficulties, specific contexts, and assumed causes.
- Study on decision-making while inspecting.

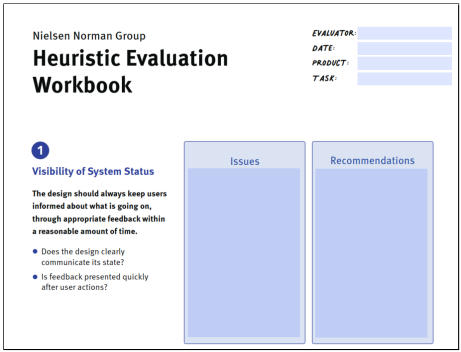


Part of the first step of ESRF. [Screenshot taken by Martin Rabensteiner.]

[1] doi:10.1145/985921.986083

Heuristic Evaluation Workbook [2023]

- Nielsen Norman Group.[1]
- 6-page PDF.
- Nielsen's 10 heuristics.
- 2 fields for every heuristic (issues and recommendations).



Heuristic Evaluation Workbook. [Screenshot taken by Martin Rabensteiner.]

[1] https://nngroup.com/articles/how-to-conduct-a-heuristic-evaluation/

4. Installable Tools

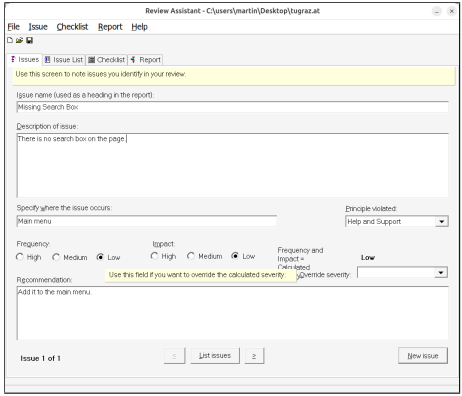
Installable Tools

- Review Assistant [2002–2004]
- UZ Review [2003]
- UX Check [2014–2019]
- UX Teardown [2022–]
- Heuristic Evaluation Inspector [2025–]

Greyed out tools are only described in full survey paper.

Review Assistant [2002–2004]

- Information & Design (Australia).[1]
- Windows application.
- Limited features (no screenshots).
- License key needed for report generation.

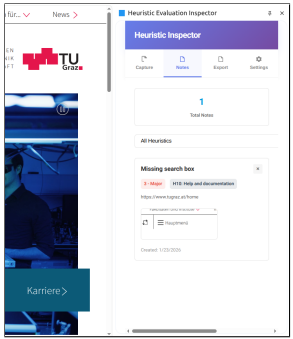


Review Assistant Issues panel.
[Screenshot by Martin Rabensteiner, showcase video: https://martinrabensteiner.at/he/survey/videos/reviewassistant.mp4.]

[1] https://web.archive.org/web/20080724190035/http://infodesign.com.au/usabilityresources/reviewassistant/default.asp

Heuristic Evaluation Inspector (HEI) [2025–]

- Mohamed Amasha.[1]
- Chrome extension, sidebar.
- Screenshot capturing through the tool.
- Findings not editable.



HEI findings overview.
[Screenshot taken by Martin Rabensteiner, showcase video: https://martinrabensteiner.at/he/survey/videos/hei.mp4.]

[1] https://chromewebstore.google.com/detail/heuristic-evaluation-insp/opjfancdaoajjokijfdmdjlmhocepnde

5. Online Tools

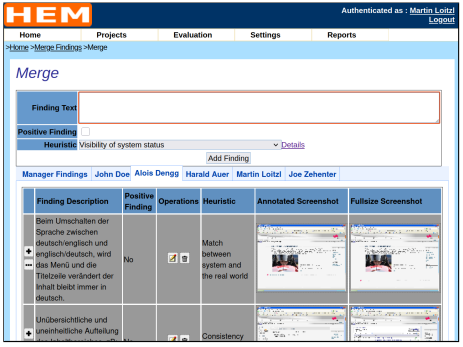
Online Tools

- MDX [2000]
- Heuristic Evaluation Manager (HEM) [2006]
- SUIT [2006]
- DHET [2007]
- H&J [2007]
- UHET [2011]
- Testpad [2010–]
- URM [2012]
- Capian [2014–]
- Smart Heuristic Evaluation (SHE) [2017]
- Heurio [2020–]
- Heurix [2020–]
- ISO9241.org [2024–]
- HeuristicsEvaluationTool [2025–]

Greyed out tools are described in full survey paper.

Heuristic Evaluation Manager (HEM) [2006]

- Master's thesis by Martin Loitzl, TU Graz.[1]
- PHP4 and MySQL – outdated tech stack.
- Classic Nielsen process approach.
- Multi-user capable and supports merging.

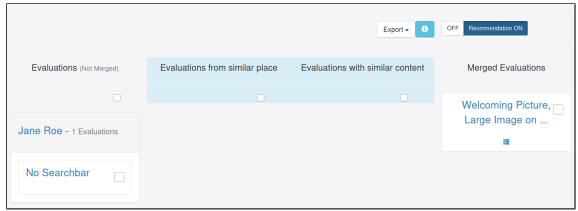


HEM Merge screen. [Screenshot taken by Martin Rabensteiner, showcase video: https://martinrabensteiner.at/he/survey/videos/hem.mp4.]

[1] https://github.com/mloitzl/hem

Smart Heuristic Evaluation (SHE) [2017]

- Bachelor's thesis by Isaac Rahnema, Paderborn University.[1]
- Python with Django and GraphLab.
- 'Smart merging' (TF-IDF).
- No demo because of outdated data science framework.

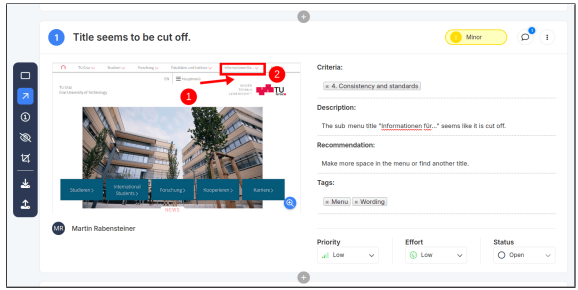


SHE merging screen. [Screenshot taken by Martin Rabensteiner, showcase video: https://martinrabensteiner.at/he/survey/videos/she.mp4.]

[1] https://cs.uni-paderborn.de/fileadmin-eim/informatik/fg/mci/Bachelorarbeiten/2017/Rahnema__Isaak.pdf

Capian [2014–]

- Commercial online service (Canada).[1]
- Monthly costs from € 35.-, multi-user.
- Timeline-layout.
- Findings depend on screenshots.
- Annotation features.
- Android and iOS app.

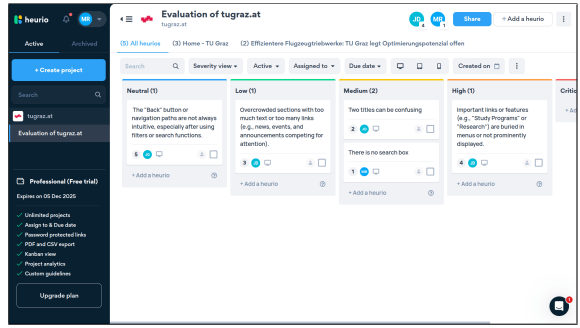


Capian issue capturing. [Screenshot taken by Martin Rabensteiner, showcase video: https://martinrabensteiner.at/he/survey/videos/capian.mp4.]

[1] https://capian.co/

Heurio [2020–]

- Commercial online service (Hungary).[1]
- Monthly costs from $ 9.9, multi-user.
- Kanban board to collect findings.
- Obligatory Chrome plugin to add findings.



Heurio dashboard.
[Screenshot taken by Martin Rabensteiner, showcase video: https://martinrabensteiner.at/he/survey/videos/heurio.mp4.]

[1] https://heurio.co/

Overview

Feature	HEM	SHE	Capian	Heurio
availability	code, Master's thesis	code, Bachlor's thesis	online service	online service
owner	Martin Loitzl	Isaak Rahnema	UX-CO Conseil Inc	Apptum Hungary Ltd.
launch	2005	2017	2014	2020
licence	MIT	MIT	closed source	closed source
tech stack	PHP 4.4.9, MySQL 4.1.22	Python (Django)	Ruby	Vue.js
dark/light mode	light	light	light	light
responsive	no	yes	yes	yes
support for multiple evaluators (merging)	yes	yes	no	no
evaluator management	yes	yes	yes	yes
sets of heuristics	fixed and custom	custom	fixed and custom	fixed and custom
distinguish between pos./neg. findings	yes	yes	yes	yes
attach a descriptions	yes	yes	yes	yes
attach a screenshots	yes	yes	yes	yes
attach a video clips	no	no	no	no
...	...	...	...	...

6. Conclusion and Outlook

Features of Future Online HE Tool (HEM2)

- Multi-user.
- Open source.
- Current web technologies.
- Responsive.
- List merging as modern web solution ($\rightarrow$ project part).
- Merging recommendations (TF-IDF...).
- Integrations (e.g. GitHub, JIRA).

Full Survey Paper

To be published under

https://ftp.isds.tugraz.at/pub/surveys/

Questions?