

A Survey of Heuristic Evaluation Tools

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1. Usability Evaluation

Usability Evaluation

- Who does the evaluation?
 - Usability experts → Usability inspection.
 - Representative users → Usability testing.
- What is the purpose of the evaluation?
 - Find problems during implementation → Formative.
 - Assess quality after implementation → 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](https://doi.org/10.1145/77481.77486)

Heuristic Evaluation – Heuristics

Jakob Nielsen's 10 usability heuristics¹:

- 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.

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.

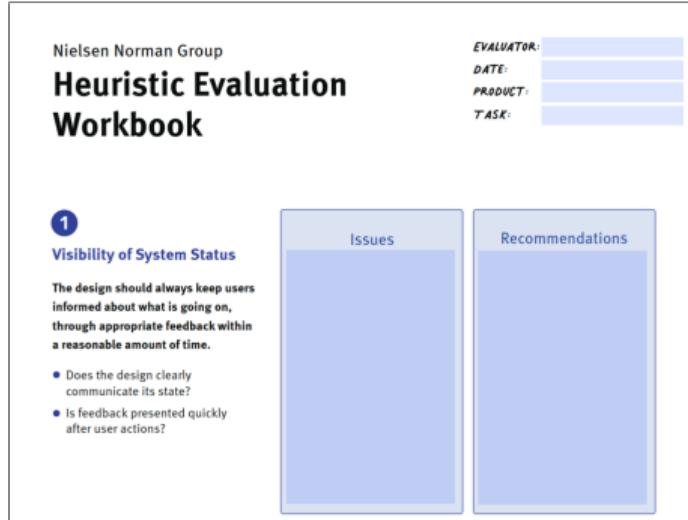
Section 1 – Problem Description
Brief Description
Specific Likely/Actual difficulties
Specific Context (If Applicable)
Assumed Causes

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

¹[doi:10.1145/985921.986083](https://doi.org/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

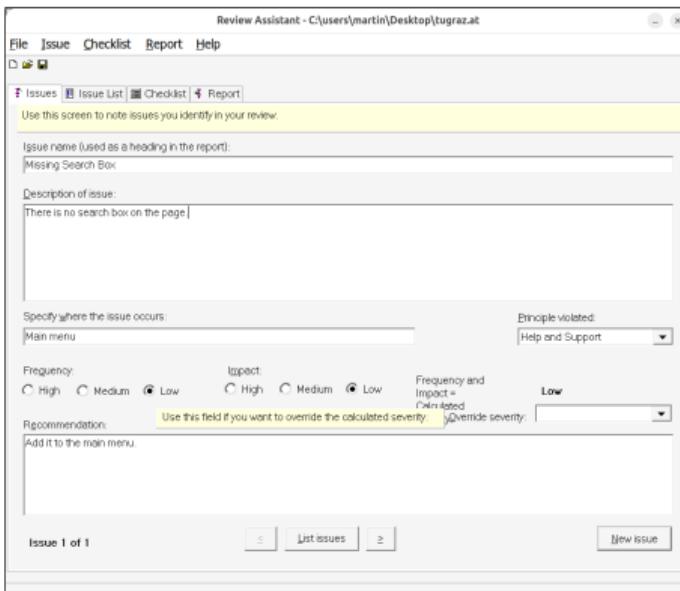
Installable Tools

- 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.

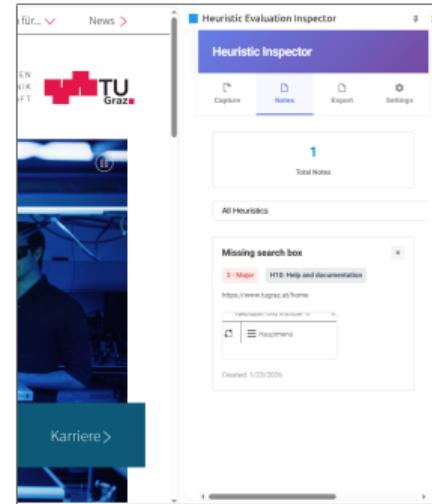


Review Assistant Issues panel.
[Screenshot by Martin Rabensteiner, showcase video:
<https://martinrabensteiner.at/he/survey/videos/reviewassistant.mp4>.]

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/opjfancdaojajokijfdmdjlmhocepnde>

5. Online Tools

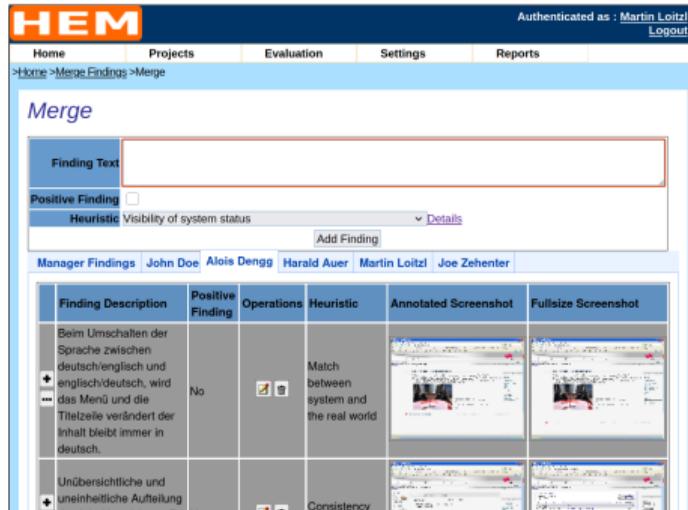
Online Tools

- 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.



Manager Findings	John Doe	Alois Dengg	Harald Auer	Martin Loitzl	Joe Zehnter	
Beim Umschalten der Sprache zwischen deutsch/englisch und englisch/deutsch, wird das Menü und die Titelleiste verändert der Inhalt bleibt immer in deutsch.	No			Match between system and the real world		
Unübersichtliche und uneinheitliche Aufteilung				Consistency		

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.

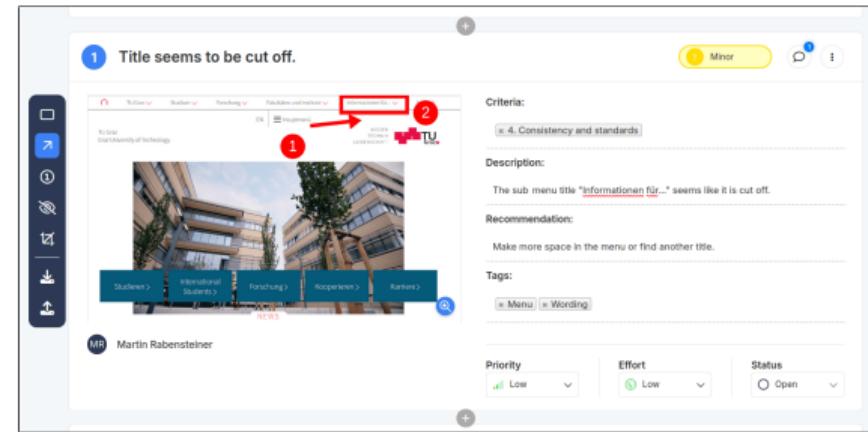


SHE merging screen. [Screenshot taken by Martin Rabensteiner, showcase video: <https://martinrabensteiner.at/he/survey/videos/she.mp4>.]

¹https://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.

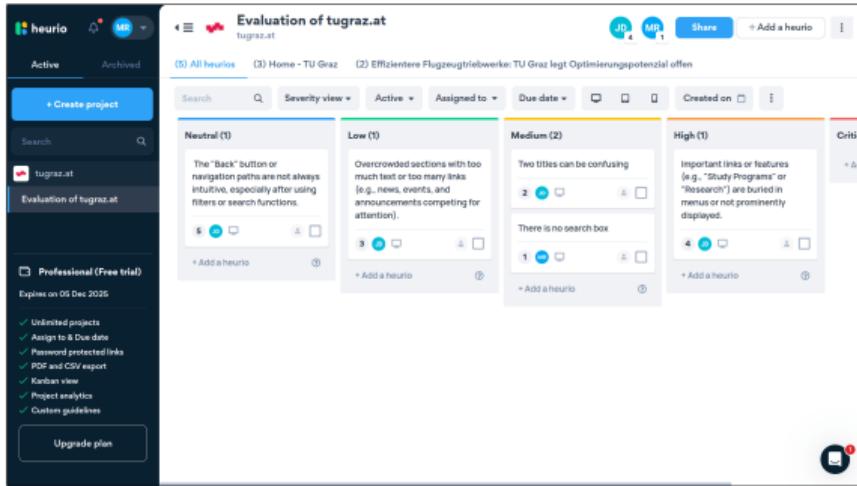


Capian issue capturing. [Screenshot taken by Martin Rabensteiner, showcase video: <https://martinrabensteiner.at/he/survey/videos/capian.mp4>.]

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.



The screenshot shows the Heurio dashboard for a project titled "Evaluation of tugraz.at". The dashboard has a header with a search bar, a user icon, and a "Share" button. Below the header is a navigation bar with "Active" and "Archived" tabs, and a prominent blue "Create project" button. The main area is a Kanban board divided into four columns: "Neutral (1)", "Low (1)", "Medium (2)", and "High (1)". Each column contains several cards with text descriptions of user interface issues. For example, the "Low" column has a card about "Overcrowded sections with too much text or too many links". The "Medium" column has a card about "Two titles can be confusing". The "High" column has a card about "Important links or features (e.g., "Study Programs" or "Research") are buried in menus or not prominently displayed". At the bottom of the dashboard, there is a sidebar with a "Professional (Free trial)" section listing features like "Unlimited projects" and "Kanban view", and a "Upgrade plan" button.

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, Bachelor'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 (→ 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?

