Heuristic Evaluation

Objective:

To understand the process of Heuristic Evaluation...

To employ the ten principles for evaluating an interface.

Introduction:

Heuristics evaluation is s systematic process of inspection testing of a user interface (of a software application / device) for usability problems. It is both a- "before design finalization' -predictive method as well as an 'after design'evaluation and rating method.

The goal of heuristic evaluation is to find usability problems in design
So that they can be attended to as integral part of an iterative cyclic user centered design processes.

Heuristic evaluation method usually involves a small set of independent evaluators (5 to 7) who examine the interface and judge its compliance with recognized usability principles such as for example Nielsen's ten Usability principles.
Some other guidelines that are used are as follows:

1. Bastien and Scapin created a set of 18 Ergonomic criteria [paid link]
2. Gerhardt-Powals10 Cognitive Engineering Principles
3. Connell & Hammond's 30 Usability Principles [inverted pdf]
4. Smith & Mosier's 944 guidelines for the design of user-interfaces (from 1986)

One or more 'Experts' analyse the interface for a series of predefined scenarios. Whenever a defect or shortcoming is noticed a note is made including giving weight-age of the severity (according to the experts qualitative judgment.)

This is what Neilsen stated "I originally developed the heuristics for heuristic evaluation in collaboration with Rolf Molich in 1990 [Molich and Nielsen 1990; Nielsen and Molich 1990]. I since refined the heuristics based on a factor analysis of 249 usability problems [Nielsen 1994a] to derive a set of heuristics with maximum explanatory power, resulting in this revised set of heuristics [Nielsen 1994b]."

Heuristic evaluation can be done by a single expert. However according to Nielsen the chances of finding all the issues (usability problems) increases when a team of experts does it. Nielsen and Landauer (1993) present such a model based on the

following prediction formula for the number of usability problems found in a heuristic evaluation:

$$\text{ProblemsFound}(i) = N(1 - (1-l)^i)$$

where ProblemsFound(i) indicates the number of different usability problems found by aggregating reports from i independent evaluators, N indicates the total number of usability problems in the interface, and " l " indicates the proportion of all usability problems found by a single evaluator.

Hence either a team of experts evaluates it collectively or individually. If done individually, all the evaluations of all the experts are collated. Bias is prevented when the experts do the evaluation individually and independently without exchanging notes till the end. Often an observer records the expert's comments.

In a typical evaluation session, the expert evaluator goes through the interface several times and inspects various dialogue & other elements by cross referencing them with a list of usability principles which are termed as *heuristics.*

In principle, the evaluators decide on their own how they want to proceed with evaluating the interface.Opinions such as " I don't like it…" are not accepted unless accompanied by a logical reasoning by the expert with reference to principles of heuristics.Heuristic evaluation is performed by having each individual evaluator inspect the interface alone.

At least two times of going through the evaluation are recommended- the first one to – a holistic view to get familiar with the specific interface and n second time for an in depth analysis.

The output of an heuristic evaluation is a list of usability problems and the weightage or severity of each of the problems.

Nielsen's ten points aid as a check list for the heuristic evaluator to audit a interface/application/product.According to Nielsen the ten points help in identifying and explaining problems.Other researchers have added to the above list of ten.

Only after all evaluations have been completed are the evaluators allowed to exchange & discuss and have their findings aggregated. This procedure is important in order to ensure independent and unbiased evaluations from each evaluator. The results of the evaluation can be recorded either as written reports from each evaluator or by having the evaluators verbalize their comments to an observer asthey go through the interface.

Heuristic reviews are less expensive and less time consumingto conduct. The cognitive walkthrough can be accomplished using only a simulation prototype or mock up as a complete finished product is not necessary. Even wireframes suffice.

Compiling Heuristics

The Heuristic evaluation is compiled into a consolidated report by including results of other evaluators. Intensity of the problem may also be indicated in terms of severity. High severity means it is a HCI problem. Medium means the problem needs attention as it is partially resolved. Low means improvement can still be done to the existing state.

The Results are displayed in the form of a table as shown below:

Heuristics	Evaluator 1		Evaluator 2	Evaluator 3	Evaluator 4
1. Visibility of System Status	**System status if the Network connection is lost is absent**	Severity : Medium			
2.Match between System and Real World	**Good. No intervention required**	NA			
3. User Control and Freedom	**For a novice user disappearing zoom slider bar can be confusing!**	Severity : Low			
4. Consistency & Standards	**Good. No intervention required**				
5. **5. Error Prevention**	**Good. No intervention required**				
6. Recognition Rather than Recall	**Navigating by panning and zooming often leads to being lost. Direction of movement is required**	Severity : HIGH			

Assignment

For the same "Google Earth" application conduct a Heuristic evaluation for all ten Nielsen's heuristics and fill up up the space under Evaluator 2 in the table.
What new aspects did you as an expert identify that the first evaluator did not?

Heuristics	Evaluator 1		Evaluator 2	Evaluator 3	Evaluator 4
1. Visibility of System Status	System status if the Network connection is lost is absent	Severity : Medium			

For solutions to the assignment see Case Study of another Heuristic Analysis Case under Module 2.

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References

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