Gerhardt-Powals Cognitive Principles Cheat Sheet

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Introduction

Jill Gerhardt-Powals – a professor from the Information and Computer Science Program at Stockton University – developed a set of cognitive principles for enhancing computer performance. These heuristics or principles are similar to the Nielsen and Molich rules of thumb but take a more holistic approach to evaluation.

The Gerhardt-Powals cognitive principles offer us a 9-point checklist to facilitate this “handholding”. As a designer, you should design having these points in mind. Once the designs are ready, you can also run a heuristic evaluation on your design to quickly pick up on areas that you may be too “close” to in your design (and world as a designer!) to notice.

Our users are human. Thus, you should design to avoid increasing their cognitive load. A good way to keep their perspective in mind might be to imagine if your design were a piece of emergency equipment, such as a defibrillator. Clear, concise instructions, aided by ambiguity-free illustrations (pictographs) in a logical sequence will show them what they need without derailing their train of thought and causing frustration.

Credit: https://www.interaction-design.org/literature/article/the-cognitive-principles-of-gerhardt-powals-ace-your-capacity-to-understand-human-behavior

1. Automate unwanted workload

■Free cognitive resources for high-level tasks.

■Eliminate mental calculations, estimations, comparisons, and unnecessary thinking.

As designers, we know all about not giving our users work to do. Do you remember Gestalt Laws? By using such principles as continuity or proximity, we can make it easy for the user’s eye to “think” for the brain. There are several ways of designing so that users find themselves not having to ask your design questions, and they can have fun in the process as they look at cool effects.

2. Reduce uncertainty.

■ Display data in a manner that is clear and obvious.

This means designing the data to appear in the briefest and simplest manner possible. Keeping Hick’s Law firmly in mind here will pay big dividends: that is, the more choices you present your users with, the longer it will take them to reach a decision. A user who’s following a direct and straightforward “pathway” with certainty is more likely to follow through with what you want him/her to do.

3. Fuse data

■Reduce cognitive load by bringing together lower level data into a higher-level summation.

Here, it’s important to consolidate the small bits of data in an all-encompassing description. Your users have memory loads; giving them a “running commentary” string of individual pieces of data can tax them and try their patience. If you can combine a string of facts into a summary statement, you’ll save them from getting frustrated. Don’t feel like you’re patronizing them because you connected the “dots” for them.

4. Present new information...

Present new information with meaningful aids to interpretation

■Use a familiar framework, making it easier to absorb.

■Use everyday terms, metaphors, etc.

We should never underestimate the value of a relevant analogy.If you’ve got an abstract concept and a metaphor fits, use it. The computing world has applied metaphors before: a “Trojan” virus comes from the mythical wooden horse the Greeks used to attack the defenders of Troy. Carl Sagan was an expert at metaphor use, presenting lofty concepts in a language any television viewer of his “Cosmos” series (1970s) could understand. For example, by slicing an apple pie, he introduced slicing atoms..

5. Use names conceptually related to function.

■Context-dependent

■Attempt to improve recall and recognition.

■Group data in consistently meaningful ways to decrease search time.

Remember that if a user has to take a moment to remember something, a) that is work, and b) that user might not be able to remember easily, which will frustrate him/her and weaken the impact of your design. Recognition is far more powerful a tool than recall. If we use a little metaphor here, we can see this illustrated. If we treat our web design like we’re showing users a map, it’s far better to ease the process by narrowing down the possibilities so that they don’t make “wrong turns”. If you want the user to “click”, use “click” consistently, as you would expect to see post offices or rivers marked on a map in a consistent way. Lay out your elements so that the user recognizes them or intuits use right away. Remember your Gestalt Laws and apply them appropriately. That way, you will have done their searching and sorting for them before they’ve even had to think about it..

6. Limit data-driven tasks

- Reduce the time spent assimilating raw data.
- Make appropriate use of color and graphics.

Here again, we can aim to design in such a way that our users can focus on graphic display. In web design, we have a powerful arsenal, or toolbox, at our disposal. We can present raw data in ways that won't bog down the user's attention. The Gestalt Laws again come to our aid. We can draw the user's eye to any desired element as if it were a bulls-eye on a dart board. Knowing the appropriate color schemes is a big help there. Consider contrast, for example.

7. Include in displays only that information ...

Include in the displays only that information needed by the user at a given time.

Guiding the user one step at a time means providing the relevant information in small releases. Instruction manuals adopt this step process and for good reason. The more sophisticated your web design, the more "chapters" of information you will have to create. Avoid the temptation to combine steps; if you need an extra link or page, it's far better to do that than risk crushing the text. Whitespace is a great calming tool.

8. Use multiple coding of data when appropriate

Can you show your data in several ways or at several levels? Not all users like bar charts or graphs, for example. Think laterally: is there another means by which you can represent your detail in order to satisfy users of all types? What about their ability levels? Is your web design accessible by everyone in at least one way at any given moment?

9. Practice judicious redundancy

Carefully applied redundancy of information is important to ensure that you leave nothing "out". As we're using the word "judicious", let's think of a courtroom. Lawyers practice the art of questioning so that a witness can confirm statements of fact. As a designer, you can use this sensible redundancy by giving repeated information than the user would otherwise need. This keeps consistency and prevents confusion or ambiguity. This step is particularly good for catching any conflicts that arise between numbers 6 and 8 on our list..