Methods of Design Synthesis for Design Practitioners

Jon Kolko
frog design
804 Congress Avenue
Austin, TX 78701 USA
+1 512 477 3764
jon.kolko@frogdesign.com

OVERVIEW

User-centered design research activities produce an enormous quantity of raw data, which must be systematically and rigorously analyzed in order to extract meaning and insight. Unfortunately, these methods of analysis are poorly documented and rarely taught, and because of the pragmatic time constraints associated with working with clients, there is often no time dedicated in a statement of work to a practice of formal synthesis. As a result, raw design research data is inappropriately positioned as insight, and the value of user-centered research activities is marginalized – in fact, stakeholders may lose faith in the entire research practice, as they don't see direct return on the investment of research activities.

Design synthesis methods can be taught, and when selectively applied, visual, diagrammatic synthesis techniques can be completed relatively quickly. During Synthesis, Designers visually explore large quantities of data in an effort to find and understand hidden relationships. These visualizations can then be used to communicate to other members of a design team, or can be used as platforms for the creation of generative sketching or model making. The action of diagramming is a way to actively produce knowledge and meaning.

This tutorial introduced various methods of Synthesis as ways to translate research into meaningful insights. Tutorial participants learned about how to manage the complexity of gathered data, and through hands-on exercises, they applied various synthesis methods to elicit hidden meaning in gathered data.

Keywords

Design Synthesis, Methods

INTRODUCTION

As the Designer concludes the research phase of the design process, they are left with a large quantity of data; the data, while potentially of great use, can be overwhelming and difficult to understand. Additionally, because of the overwhelming nature of the content and the frequently scarce resource of time, the designer is forced into an immediate conundrum: they must make sense of the data by immersing themselves in it, but the immersion takes time – and the more time spent inspecting the gathered data, the less time can be spent actually designing.

The goal of this immersion process, then, is to quickly make meaning out of the gathered content – to create information or knowledge where before there was only data. The methods presented in this tutorial describe this movement from data to information and knowledge.

METHOD: CONCEPT MAPPING

A concept map is a graphical tool for organizing and representing knowledge. It "serves as a kind of template or scaffold to help to organize knowledge and to structure it, even though the structure must be built up piece by piece with small units of interacting concept and propositional frameworks" [1]. Essentially, the map can be thought of as a picture of understanding [2]. A concept map is a formal representation of a mental model; a mental model "represents a possibility, or, to be precise, the structure and content of the model capture what is common to the different ways in which the possibilities could occur… when you are forced to try to hold in mind several models of possibilities, the task is difficult" [3]. The concept map itself represents the creators' mental model of a concept, but it also informs and shapes that mental model during creation as it allows designers to see both the holistic scale of the concept and also critical details within the concept. As it affords action-based understanding at both a gross and fine level, both its creation and its usage become tools for sensemaking.

METHOD: PROCESS FLOW DIAGRAMMING

A process flow diagram illustrates the logical path through a system, showing decision points and articulating cause

and effect relationships throughout the system and the use of a system. It is, generally, "emotion agnostic" – it focuses on actions and reactions (of both people and the system itself). Building a process flow is a form of synthesis, in that a designer is forced to rationalize knowledge related to temporal flow, and is constantly required to change their frame and consider the totality of behavior. Specifically, building a process flow diagram forces the consideration of the "complete story", rather than just the "main story" – a designer must consider the edge cases, describing what happens when less desirable behavior occurs with a product, service or system.

A process flow diagram helps a designer move from data to information, in that it contextualizes a discrete step in the larger context of the entire process, grounding a particular action or movement in relationship to other actions or movements. This forces an evaluation of human and system decision points, and pushes the designer to consider what will happen when a person does something or acts in a certain way.

METHOD: REFRAMING

Designers approach creative problem solving in the conceptual context of a "frame", as described earlier. To reiterate in brief, Schön describes that a creative design "hypothesis depends on a normative framing of the situation, a setting of some problems to be solved" [4]. This normative framing is a perspective that highlights "a few salient features and relations from what would otherwise be an overwhelmingly complex reality" [5]. The frame is usually selected without introspection, based on experience, research and assumptions. Frames become the technique used to "organize the large-scale structure of inference making" [6].

Reframing is a method of shifting semantic perspective in order to see things in a new way. The new frame "re-embeds" a product, system or service in a new (and not necessarily logical) context, allowing the designer to explore associations and hidden links to and from the center of focus. This method attempts to move from knowledge to wisdom, as it demands that the designer empathize with a target audience and attempt to understand how something would feel in a particular situation. Additionally, this method requires that the designer tell a short but compelling story about a particular new perspective – emphasizing both behavior and empathy.

METHOD: INSIGHT COMBINATION

A common goal for designers is to identify new and interesting ideas as "concepts" – to come up with a multitude of potential designs at a very high level, leaving the refinement for a later stage. Often, the motivation of this activity is to offer a view of what "could be", not necessarily what "should be"; this allows more conservative stakeholders to envision the future and dream about directions for products and services. These dreams, or concepts, are fed by insights, and these insights are in turn fed by design research. This manner of moving from research to insight to idea is formulaic, relying on an active and iterative approach by design teams; this is often thought of as "rigorous design process". However, the process itself rarely lives up to the name, as a rigorous process implies a sense of documentation, control, purpose and repeatability that simply isn't present when most designers tackle problems if innovation and "newness".

Insight combination is a method that generates a multitude of new ideas, and embeds these ideas firmly in the opportunity area as well as in the cultural context of the design team. This implies that design ideas will be tied to research findings, and also tied to patterns in society and culture.

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Tutorial Description