Conceptual Models: Core to Good Design

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Abstract
A crucial step in designing a user interface for a software application is to design a coherent, task-focused conceptual model (CM). With a CM, designers design better, developers develop better, and users learn and use better. Unfortunately, this step is often skipped, resulting in incoherent, arbitrary, inconsistent, overly-complex applications that impede design, development, learning, understanding, and use. This course covers what CMs are, how they help, how to develop them, and provides hands-on experience.

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ACM Classification Keywords
D.2.2. Design Tools and Techniques: Object-oriented design methods, User interfaces; D.2.10. Design: Methodologies; H.1.2. User/Machine Systems: Software psychology; H.5.2. User Interfaces: Theory and Methods, User-centered design.

Introduction
Designing a conceptual model is an important step in designing a user interface – possibly the *most* important step. The conceptual model is the *ontology* of an application: how it carves the task-domain into concepts – objects, operations, attributes, relationships – and how concepts are related. The goal is to devise a conceptual model based on the users' *task domain*, rather than on the underlying technology. Many UI designers, software developers, and development managers don't understand this: they jump straight to sketching and prototyping user interfaces, often resulting in applications that are incoherent, arbitrary, overly-complex, and that require users to understand concepts that are irrelevant to their tasks.

This class covers:

- What conceptual models are.
- How they improve software design and development.
- How UIs based on conceptual models provide a better fit with human learning and cognition.
- Perils and pitfalls of not designing a conceptual model.
- Object/operations analysis (part of designing a conceptual model).
- An example conceptual model for a specific application.

Hands-on exercises designing conceptual models for simple applications.

Intended Audience

This course is intended for software designers and developers of all levels of experience. Others who might benefit: Software Q/A engineers, usability testers, and development managers.

Agenda

Part 1 (80 min)

- The Role of Models in Using and Designing Tools (15 min)
- Conceptual Model Basics (20 min)
- Benefits and Bloopers (15 min)
- Notation for Representing Conceptual Models (5 min)
- Conceptual Models' Place in Development Process (5 min)
- Whole-class exercise: Object/Action Analysis of a Simple Application (20 min)

Part 2 (80 min)

- Small group exercise: Object/Action Analysis of a second Simple Application (40 min)
- Discussion of Exercise Results (35 min)
- Summary, Wrap-Up, Evaluations (5 min)

Instructor Biography

Jeff Johnson is President and Principal Consultant at UI Wizards, Inc., a product usability consultancy (uiwizards.com). He also is a co-founder and principal at Wiser Usability, Inc., a consultancy focused on usability and accessibility for adults over 50. After earning B.A. and Ph.D. degrees from Yale and Stanford Universities, he worked as a UI designer and implementer, engineer manager, usability tester, and researcher at Cromemco, Xerox, US West, Hewlett-Packard Labs, and Sun Microsystems. In 1990, he co-chaired the first Participatory Design conference, PDC'90. Since 2004 he has served on the SIGCHI U.S. Public Policy Committee. He has taught at Stanford University and Mills College, and in 2006 and 2013 he taught HCI as an Erskine Fellow at the University of Canterbury in New Zealand. He is an ACM Distinguished Speaker, and in 2014 was inducted as a member of the ACM SIGCHI Academy. He has authored or co-authored many articles and chapters on Human-Computer Interaction, as well as the books *GUI Bloopers*, *Web Bloopers*, *GUI Bloopers 2.0*, *Designing with the Mind in Mind*, *Conceptual Models* (coauthored with Austin Henderson), and *Designing with the Mind in Mind, 2nd edition*.