Books: Overviews and Reviews

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This quarter we bring you an in-depth review of *User and Task Analysis for Interface Design*, by our guest reviewer, Paul McInerney. In addition, we overview two recent publications which we think will be of interest to you. If you are interested in acting as a "guest reviewer" for these or other texts, please contact chi-bulletin-pubs@acm.org for more information.

Overviews of Recent Works

The Ergonomics of Computer Pointing Devices
by Sarah A. Doublas and Anant Kartik Mithal, Springer, 1997

This book provides an in-depth coverage of the ergonomics of computer pointing devices. Using a human-centered design perspective, it emphasizes the importance of human performance as a basis for the evaluation of existing pointing devices and the design of new devices. The book includes: (1) a comprehensive background on psychomotor research of human pointing performance; (2) a summary of the results of 20 years of ergonomic research on devices; and (3) extensive explanation of how computer pointing device performance is integrated into task analysis. The final chapter addresses standards and looks at future developments in pointing devices.

Developing User Interfaces
by Dan R. Olsen Jr., Morgan Kaufmann, 1998

Most user interface books concentrate on psychology and usability, not on programming techniques. This book is unique in that it is targeted at the programmer who will implement, rather than design, the user interface. It recognizes the need for programmers to collaborate with usability experts and psychologists, however. Consequently, it includes topics such as the principles of visualization, human perception, and usability evaluation. It claims to apply to any programming situation, and includes code examples written in 'pseudocode'. While it covers the basic concepts of traditional computer graphics (e.g., drawing and three-dimensional modeling), it also examines advanced programming such as event handling, input syntax, interaction with geometric objects, and widget tool kits.

In-depth Book Review

By guest reviewer, Paul McInerney

User and Task Analysis for Interface Design
by JoAnn Hackos and Janice Redish, John Wiley & Sons, 1998, ISBN: 0471178314

I was once assigned to join a team being formed to conduct a HAZOP analysis. "A HAZ-what?", I thought. Looking for a way to get up to speed, I picked up *A Guide to Task Analysis* (Kirwan and Ainsworth, 1992) and within 20 minutes I knew how to do a HAZOP analysis. On another occasion, I was assigned to improve the efficiency of a procedure by recommending changes to the procedure and/or the user interface. I again picked up *A Guide to Task Analysis* and found a technique, operational sequence diagrams, that I could tailor for this assignment. These and other "critical incidents" illustrate why this book holds a coveted position on my bookshelf. I was therefore intrigued to learn about a new book, *User and Task Analysis for Interface Design.* Was it time to retire *A Guide to Task Analysis* in favor of a new and better book?

A Guide to Task Analysis is a compendium of over 30 techniques. Each technique is described in a few pages under headings like overview, suitable applications, description of the technique, practical advice, pros and cons, and further reading. This is not the kind of book many people would read cover to cover but it is indispensable when planning to tackle a specialized task analysis assignment.

User and Task Analysis for Interface Design presents a treatment based on the authors' considerable practical experience. The book takes the middle ground between a single step-by-step methodology and a comprehensive catalog of approaches. The authors describe their approach as an eclectic selection of techniques that emphasize "qualitative and informal methods of watching and listening carefully..." (p. 8) and that draws on participatory design in the Scandinavian model. Chapter topics follow the order in which a task analysis might be conducted: understanding task analysis concepts and making the business case (Part 1), preparing for site visits (Part 2), conducting the visit (Part 3), and synthesizing the data and using it in UI design (Part 4). The focus is on task analysis for software UIs with a strong secondary coverage of documentation design, including a chapter on special considerations for documentation and training.

The methodology can be described further by examining how it addresses the following questions: (1) What kind

of information is needed? (2) How is it collected? (3) How is the raw data synthesized and represented for communication to the team? and (4) How is it used in design. On the issue of what information is needed, the focus is on learning what employees do in their job at a concrete level similar to business process or system analysis. The book does not address describing and analyzing observed user task behavior at a more abstract/psychological level using existing taxonomies and frameworks (e.g. taxonomies of errors, search tasks, action verbs); one exception is the presentation of Norman's Action Cycle.

On the issue of how to collect the information, the authors strongly espouse conducting site visits to observe actual users working and not settling for anything less direct. However, this position is at the expense of a more balanced survey of methods that have been successfully used by task analysts. While the book covers alternate techniques (e.g. surveys and off-site interviews) it is mainly to show deficiencies compared to the preferred approach.

On the issue of how the collected information is synthesized and represented, the book focuses on semi-formal, easy-to-use approaches like lists, tables and narrative descriptions rather than more sophisticated, and sometimes esoteric, techniques found in *A Guide to Task Analysis*. The sixteen techniques covered include lists of user types, workflow diagrams, task sequences, task hierarchies, scenarios, and affinity diagrams. These provide a relatively comprehensive and easy to use starter set. The techniques are covered at an introductory level, conveying the general approach but not getting into nuances of handling various situations like conditional task sequences or analyzing teamwork other than business process workflows.

The issue of how to use task information in design finds the authors on somewhat less firm ground. However, they are in good company as the field of human-computer interaction is only recently coming to grips with this issue (e.g. Wood, 1998).This topic is covered with frequent references to Tom Dayton's approach (see Wood, 1998). Part of the book's approach involves converting information about current tasks into a description of tasks in the new system. Unfortunately, the authors adopt the obtuse terminology of "use..." to mean "new system" (e.g. use workflows, use hierarchies) apparently a nod to "use cases" popular in object-oriented methodologies. Of related interest, the book includes a good description of UI prototype design and evaluation.

Quite apart from its methodology, this book can be appreciated for its practical presentation. In fact, I've inducted this book into my personal Practical Hall of Fame where it joins a select few (including *A Guide to Task Analysis* and a book by Redmond-Pyle and Moore, 1995). *User and Task Analysis for Interface Design* is exemplary in its presentation of logistical and pragmatic topics, examples and sample materials, and technical tips and tricks. Several chapters are devoted primarily to logistical and pragmatic topics. The chapter on preparing a business case for site visits is a "must read" for anyone interested in more effectively making the case for usability engineering. It suggests how to respond to several objections a task analyst might encounter (e.g. "We're changing the process so why go out and see the current process?"). Another highlight is the coverage of preparing for site visits to which three chapters are addressed. Coverage includes topics like training the task analyst team and site visit etiquette. In places, this practical focus seems too much of a good thing; for example, readers are advised to wear boots when making outdoor site visits and warned to avoid white board markers that can cause allergic reactions.

While such detailed guidance risks becoming soporific, interest is maintained by copious real examples and vignettes presented every couple of pages on average. Besides amplifying the points in the text, they provide much incidental learning; in one example we learn that users in one country had quite different training and education than in others leading to different needs for the system. Besides examples, there are samples or templates for a business case, site visit plan, to mention a few.

There are also plenty of technical tips and tricks that will help even experienced readers sharpen their skills. A highlight are two chapters devoted to skill honing, one on observation skills and the other on interview skills.

In conclusion, *User and Task Analysis for Interface Design* presents a perspective of task analysis from the trenches with a strong ethnographic and participatory design flavor. This book strikes a good balance between the needs of different readers. For computer professionals new to HCI, this book is the next best thing to a mentor or consultant; however, these readers might find the length a bit daunting if they want a "quick start guide". Students will find a well thought out approach to the entire enterprise of task analysis from planning to using the information in design; however, they will have to look elsewhere for a fuller conceptual survey and critical review of the literature. Experienced task analysts will find many skill improvement tips and examples that will spur ideas to improve their work; however, they will need to wade through a fair amount of material addressed to neophytes.

Will I retire my trusty *A Guide to Task Analysis*? No. These books complement each other. *Guide to Task Analysis* serves as a compendium of techniques while *User and Task Analysis for Interface Design* provides advice and examples for the overall enterprise.

References

Kirwan, E and L.K. Ainsworth (1992). *A Guide to Task Analysis*. Washington D.C, Taylor & Francis.

Redmond-Pyle, D. and A.Moore (1995). *Graphical User Interface Design and Evaluation (GUIDE): A Practical Process.* New York: Prentice Hall.

Wood, L. (1998) *User Interface Design: Bridging the Gap from User Requirements to Design.* Boca Raton, FL: CRC Press.