

# Handbook of Research on Socio-Technical Design and Social Networking Systems

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Volume I

Information Science  
**REFERENCE**

**INFORMATION SCIENCE REFERENCE**

Hershey • New York

Director of Editorial Content: Kristin Klinger  
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Typesetter: Michael Brehm  
Cover Design: Lisa Tosheff  
Printed at: Yurchak Printing Inc.

Published in the United States of America by  
Information Science Reference (an imprint of IGI Global)  
701 E. Chocolate Avenue, Suite 200  
Hershey PA 17033  
Tel: 717-533-8845  
Fax: 717-533-8661  
E-mail: [cust@igi-global.com](mailto:cust@igi-global.com)  
Web site: <http://www.igi-global.com>

and in the United Kingdom by  
Information Science Reference (an imprint of IGI Global)  
3 Henrietta Street  
Covent Garden  
London WC2E 8LU  
Tel: 44 20 7240 0856  
Fax: 44 20 7379 0609  
Web site: <http://www.eurospanbookstore.com>

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#### Library of Congress Cataloging-in-Publication Data

Handbook of research on socio-technical design and social networking systems / Brian Whitworth and Aldo de Moor, editors.  
p. cm.

Includes bibliographical references and index.

Summary: "Every day throughout the world, people use computers to socialize in ways previously thought impossible such as e-mail, chat, and social networks due to emergences in technology. This book provides a state-of-the-art summary of knowledge in this evolving, multi-disciplinary field"--Provided by publisher.

ISBN 978-1-60566-264-0 (hardcover) -- ISBN 978-1-60566-265-7 (ebook)

1. Online social networks. 2. Internet--Social aspects. 3. Information technology--Social aspects. I. Whitworth, Brian, 1949- II. Moor, Aldo de.

HM742.H37 2009

303.48'33--dc22

2008037981

#### British Cataloguing in Publication Data

A Cataloguing in Publication record for this book is available from the British Library.

All work contributed to this book set is original material. The views expressed in this book are those of the authors, but not necessarily of the publisher.

*If a library purchased a print copy of this publication, please go to <http://www.igi-global.com/agreement> for information on activating the library's complimentary electronic access to this publication.*

# Prologue

## Socio–Technical Design

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What is socio-technical design? How does it differ from ‘ordinary’ design? Or does it? Are we simply dressing up a well-understood practice with a fancy new name? I think not. I believe that we are seeing a gradual shift in design methods that is a consequence of the increasingly complex nature of the systems with which we are working. To consider the nature of this shift, let’s begin with ‘ordinary’ design.

Design has both an end and a means. The end of design is to make something that serves a purpose, usually many purposes. The means by which design achieves its end is a cycle of making and reflecting. This sounds simple, but as with many simple things there are hidden complexities.

The elemental act of design is casting an idea into a material form and then using *that* as an aid to thinking about the idea. Thus we have the archetype of the crude napkin sketch that serves as a focus of pointing hands and excited talk. Or an interactive mock up of a user interface. Or a 3-D model that can be rotated and viewed from different directions.

When we take an idea and translate it into what I will call a design artifact, we are able to think about it differently. Embodying it in a material form—whether physical or digital—enables us to see things in it that weren’t evident when it was only in our heads. The philosopher Donald Schön referred

to this as having “a reflective conversation with the materials of the situation” (Schön, 1987). I like this notion: When you cast an idea into a material form it takes on a life of its own—you can talk to it, and it will talk back! This quasi-magical act is the core of what it means to be a designer.

Another advantage of casting an idea into material form is that it makes it easy to talk about it with others. Talking with others—that’s really another form of reflective conversation. Not only do I think about something differently when I have cast it into a material form, but when I show it to you, you too will think of it differently, and differently from me. Then we talk, argue, joke about or mull over our differences, and as we do so the idea becomes richer.

The process of casting an idea into material form and reflecting on it occurs repeatedly, a cycle of making and reflecting. As this cycle plays out over time, it generates an expanding array of design artifacts that embody various aspects of the idea. The napkin sketch begets drawings, the drawings beget models, the models beget specifications (though the path is rarely that linear). Furthermore, as the cycle plays out, the idea changes—it grows more complex, mutates, diverges, converges and so on—generating a veritable cloud of design artifacts which can

## Section IV: Prologue

themselves be combined to create new variants of the idea. Under the right conditions, which usually involve an increasingly intense convergence of temporal, organizational and financial pressures, a product (or service or organization or whatever is being designed) will precipitate.

But as we move into the socio-technical realm, things become more complicated. As I laid out the account of design above, you may have imagined various objects of design: a cell phone, a photo browser, a house. For it is (comparatively) simple things like these, things used by an individual or a small group, towards which our current design practices are oriented.

But socio-technical design is not just about designing things, it is about designing things that participate in complex systems that have both social and technical aspects. Furthermore, these systems and the activities they support are distributed across time and space. One consequence of this is that the systems that are the sites for which we are designing are in constant flux. And even if we were to ignore the flux, the distributed nature of the systems means that they surface in different contexts, and are used by different people for different (and sometimes conflicting) purposes.

Thus, if we examine the design process from the vantage point of the socio-technical, this complexity raises a number of general questions that socio-technical systems designers will need to address.

First of all, how do we represent such systems? How do we cast a complex system into a material form in such a way that we can reflect on it? In particular, how do we create design artifacts that capture a system's distributed nature and the fact that, Rashomon-like, it may appear quite different depending on the context in which it is used and the characteristics of those who use it? An example of one approach to this end involves the use of pattern languages, first developed for use in architecture and urban design (Alexander, et al. 1977).

Second, whatever set of design artifacts we end up with—and it seems likely that the set will be much larger and more complex than those we are accustomed to—how do we carry out reflective

conversations with them? If our design artifacts have evolved to accommodate increased complexity, will our existing reflective practices suffice? How will we go about ensuring that we ask the right questions, from the right perspectives, in the right contexts? Perhaps, taking a cue from participatory design (e.g., Greenbaum and Kyng, 1991), we will need to greatly expand the range of participants involved in the reflective processes, which in turn may require developing new sorts of design artifacts to aid in participatory reflection.

Third, as we move through the cycles of representation and reflection, how do we ensure that eventually we converge? Or do we? Perhaps the notion that the end result of a design process is a stable product is old-fashioned. Perhaps we're headed towards a future of 'permanent beta,' in which things are designed so that their design may continue during use, where the leading edge of design resides not with the producers but with the users. This resonates with current ideas about open innovation communities (Von Hippel, 2005).

However things turn out, it seems clear that socio-technical design will require new methods, new tools, new participants, and new practices. This section—and indeed, much of this volume—provide views of the new vistas open before us.

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