Preface

*Human-Information Interaction* provides a systematic tour of the domain of knowledge of fields concerned with producing and communicating written information. A major goal of this book is to take a step toward laying a theoretical foundation that would enable designers and writers to use empirically grounded principles for predicting the effects of design alternatives within a specific environment. This book works to provide a framework that establishes a solid theoretical foundation that allows the designers and content developers to predict people’s needs and behavior in order to make well-informed decisions about the content they must communicate. And notice that it is “content they must communicate,” not “content they must create.” Human-information interaction revolves around communicating, not creating information.

*Human-Information Interaction* emphasizes communicating information, not writing documents or designing websites, nor methods of generating content. An express purpose of this book is to take the theoretical and applied research that has been done across several different fields and turn it into a form which is accessible to the generalist or student. The book works to provide practical knowledge based on a sound theoretical foundation for allowing design teams to engage in a meaningful dialogue as they make decisions with respect to designing that information. In the process, they can move forward with better designs and better communication because they have a more solid foundation on which to make decisions about how to communicate information, and people will interact with that information.

In their introduction to special issue of *Technical Communication* on visualization, Gribbons and Elsar (1998) say “Researchers in the cognitive, neurological, and communication fields are conducting basic research that explains the interaction of visualization with human cognition” (p. 467). They were discussing visualization, but the problem they describe is much wider than just visualization research. Unfortunately, a significant part of most of the basic research knowledge that impacts communicating information is not yet a standard part of either the technical communication curriculum or professional design team knowledge or at least not in a structured, integrated way that is useful for creating content. This book works to provide that integration and helps design teams understand how communication happens (or doesn’t happen) at a much deeper level as it connects the research findings of a range of research fields in a way that fits the needs of the people creating technical content.

In an era long past, technical information meant writing for closed-ended questions, such as procedures. But now, most texts and web pages are created with an intent of providing complex information for open-ended questions with a goal of communicating information that address questions such as “How are X and Y affecting Z?” Modern design teams need a much deeper understanding of how effective communication occurs than a procedure writer needed. Design teams are increasingly being called upon to address information needs that go beyond providing simple answers or step-by-step instructions and
those that involve communicating information for open-ended questions and problems. Questions and problems that can only be addressed by providing information specific to a situation and presenting it in a way that supports various users’ goals, information needs, and cognitive processing strategies. Woods and Roth (1988) define cognitive engineering as “about human behavior in complex worlds” (p. 417). In the same vein, technical communication is about creating content that is comprehensible and properly conforms to the expected human behavior in complex situations. Technical communication does not operate within a clean, simple world; this is a faulty assumption that has lead to many impossible to read texts and endless jokes about poorly written computer manuals. Instead, it operates within a highly complex and dynamic world (Albers, 2003, 2004; Mirel, 1998, 2003). High quality technical communication and HII means developing information that fits people’s needs. Accomplishing this goal requires understanding how people think and what drives their decision processes.

Clear communication requires understanding readers from perspectives of technical communication, cognitive psychology, usability, human-computer interaction, information design, and information science. Designing and clearly communicating information involves understanding multiple perspectives of the readers’ experiences and understanding their motivations and rationale that drives their behavior. The research in diverse areas has all examined the issue though different lenses. However, there has not been an attempt at transforming the academic studies into a form accessible to technical communication students or to practitioners charged with designing and creating the content. There are no clear-cut, correct/incorrect answers in this domain of communicating technical content. There are only tradeoffs; the ever-present “it depends” answer. It is the job of the professionals working within their field to identify those tradeoffs and know the benefits and costs of each side in the tradeoff. A major goal of this book is to provide the foundation which a design team can use to judge and explain those tradeoffs and benefits.

Human-Information Interaction focuses on communicating information, not creating information. Developing information which clearly communicates and fits people’s needs requires understanding how people think and what drives their decision processes. To help achieve that goal, this book works to:

- Lay a theoretical foundation that would enable design teams to use empirically grounded principles for predicting the effects of design alternatives on comprehension within a specific environment. In the process, it synthesizes technical communication, cognitive psychology, socio-technical system, and interface design research as it applies to people working to gain an understanding of a situation.
- Provide a framework that establishes a solid theoretical foundation that allows the design teams to predict people’s needs and behavior in order to make well-informed decisions about how to structure the content they must communicate.
- Provide an understanding of how people interact with and understand information at a much deeper level as it communicates multi-disciplinary research findings in a way that fits the needs of design teams tasked with creating technical information.
- Bring into focus the many issues that impede a reader along the path from comprehending data and transforming it into information relevant to the current situation.

The writing style is a long, detailed literature review, which connects the research across a range of fields with the skills required by a people practicing within the fields devoted to producing and communicating technical information. The book works to provide practical knowledge based on a sound theoretical foundation for allowing people to engage in a meaningful dialogue as they make decisions
with respect to designing that communication. Besides being a reference for the academic researcher or practicing technical communicator, the book is written so it can be used as a graduate textbook for either a foundational or theories of technical communication course.

Most books are written from the viewpoint of the designer or writer. They constantly make comments such as: “the designer needs to consider how…” or they provide specific guidelines for how to design a page. But this book does not take that approach. It is written from the viewpoint of how a reader interacts with text, not from the viewpoint of how to design that text. That viewpoint is then connected back to what a design team needs to consider to allow a reader to comprehend the text. There are many books that explain how to design and create content; there does not seem to be any other book that focuses on explaining how people read, comprehend, and use that content. It may seem trivial; people pour a cup of coffee, sit down, and read what is placed before them. But that is not even close to reality. For a designer to understand what will motivate people to read, comprehend, and properly use information in a specific content, they need to understand the factors which go into people interacting with a text. This book strives to provide that understanding.

Throughout the book, I use the terms “people” and “reader” and rarely refer to them as “user.” The only time I say “user” is when I’m very specifically talking about the interaction with a computer system. I’m not one of the militant anti-user terminology people; you’ll find I use the term constantly in various articles and in my previous book *Communicating Complex Information* (Albers, 2004a). But this book is focused on people and the factors that determine how effectively information gets communicated to them; interaction with a system is a secondary, albeit essential, part of that communication process. An underlying assumption of many books and articles about people and technology is that people want to use the technology. In general, this is a wrong assumption. People do not want to use a Web-based Information System or a computer application; they want to accomplish a real-world goal. The computer just happens to provide the most efficient means of achieving that goal.

Many of the sections and topics within them have multiple books written about the subject. Obviously, I cannot possibly do more than touch on the surface in the page or so spent on the topic. Plus, the audience for this book is a person engaged in communicating information to another person, not as being a researcher. The information needs of these two groups are different in both overall content and in the details. All of the topics have much more that could be said, and often I knew more specific details, but I had to select and choose based on what would be appropriate for the audience. In addition, this book deals with people as individuals interacting with information; I specifically avoid the exploding amount of social interaction research since it would more than double the page count. However, I do not see this as a serious shortcoming. The complex interactions of a group are still based on and arise from the complexity of individual interactions. A design team needs to consider how an individual will react to and approach information before they can consider how the group in which that individual is embedded will react to the information.

In the foreword of *Reshaping Technical Communication*, Redish (2002) considers Borland’s chapter where he “urges technical communicators in both academia and industry to learn about interaction design, to understand contemporary technologies and tools, to learn the principles, practices, and nuances of the knowledge domains about which they write” (p. vii). She then considered this problem from the educational viewpoint.

*Technical communication teachers already realize that their students need more than a background in rhetoric and a deep understanding of the writing process. They realize that technical communication is
also about understanding users (from cognitive psychology, usability [from ethnography, anthropology, and human-computer interaction], and information architecture [from information science]), as well as understanding information about information design and graphic design, technology, and so on (p. viii).

How well the related fields Redish mentions have moved into the classroom or are known/applied by practitioners in the field is a different story. This book reflects part of my mental image of the map of the landscape as it now stands and how a design team needs to navigate within that landscape as the field moves from writing text to helping the reader interact with and comprehend information. Hart-Davidson (2001) echoed Redish’s concerns when he discussed theory in technical communication.

With this claim, I risk rekindling a familiar and (to some) tiresome debate about the place and value of “theory” in technical communication. My claim, put another way, is that at least part of what has held technical communicators—both in the workplace and in the academy—back is the lack of adequate theory that makes our expertise sufficiently portable in time of technological change (Hart-Davidson, 2001, p. 146).

Besides being a reference for the academic researcher, this book is written so it can be used as a graduate textbook for either a foundational or theories of technical communication course. I have constructed this book with a strong eye on its use as a graduate textbook. One reason I’m undertaking this book is to help remedy a problem Davis (2001) describes by saying “If we remain locked into the image of educating writers who lack the broad-based technical grounding to succeed in the next 50 years, then we are shortchanging the future of technical communication” (Davis, 2001, quoted in Spilka, 2002, p. 100). The world of communicating information is changing; design and content based on a “looks good to me” or “that’s how I’ve always written it” philosophy is no longer appropriate. Nor should design teams have an attitude that the most important task is generating finely-crafted prose: the content of that prose and its ability to support people interacting with and understanding it is the most important task.

The major goal of this book is to bring into focus the many issues that impede people from comprehending information and understanding a situation as they move along the path of transforming data to information. It works to clarify the issues which must be considered by design teams tasked with communicating information so they can maximize the reader’s comprehension of that information.

ORGANIZATION OF THE BOOK

The book is organized into fourteen chapters. A brief description of each of the chapters follows:

Chapter 1 defines what I mean by human-information interaction and how it fits within the overall communication process and within user-centered design. It also describes the model which forms the basis for the remainder of the book. It sets up how people need to move from technology-centric views of information interaction to human-centric views.

Chapter 2 considers the information as it exists in the world. It presents a high level view of the information within a situation and how it moves toward the people who need it. In any particular situation, some information is relevant and some isn’t (with no arrows). Of the relevant information, some is more salient. The design goal is to ensure the reader receives only relevant information and most relevant is
the most salient. It reviews how information has both content and context, the importance of meeting each, and how people handle incomplete information.

Chapter 3 considers the cognitive aspects people bring to the situation. A design team has no influence over them, but instead must work within the limitations of how the human mind operates. It reviews how human memory works, cognitive resource theory, biases in interpreting information, mental models, and attention theory.

Chapter 4 considers some of those factors that influence how people approach and interpret information which they have found. Depending on people’s goals and information needs, information interaction and interpretation can differ. These differing goals and information needs means what information is important and how hard people work to understand it can differ radically between people. The chapter reviews the factors inherent in human nature, which come into play when interacting with information, such as: cognitive effort, multitasking, information salience, and age-related factors.

Chapter 5 considers how people approach and interact with technology. HII in the modern world, and as viewed within this book, almost always consists of a computer-based interaction. The computer itself influences how people interact with the information. This chapter examines some of the major ways technology exerts its influence, such as: models of accepting technology, technology factors driving user satisfaction, and motor control factors relevant to HII.

Chapter 6 considers the information as it moves from the situation to the person and some of the factors driving how people form that first impression. A design team must ensure their material leaves a good impression within the first two seconds or so of looking at a page, the time during which people evaluate the appearance and begin to read and comprehend the text. The first glance evaluation of an information display sets people’s expectations; if they believe it will be highly usable, they will tend to continue to believe that. The chapter reviews perception and preattentive processing, page appearance, Gestalt theory, optical illusions, and change blindness.

Chapter 7 considers how the typography used for presenting the information exerts a profound effect on the effectiveness of the communication. A design team must ensure that the typography gives proper salient to the important information and does not distract the reader with poor readability. It reviews font design, font legibility and readability, and how people perceive different fonts.

Chapter 8 considers how the graphics used for presenting information exert a strong affect on how the information is perceived. Use of graphics helps people interpret a situation more quickly. However, even if they find information that is accurate and reliable, that information is essentially useless unless they are able to interpret and apply it to their current situation. It reviews the cognitive processing of graphics, how text and graphics work as an integrated pair, and the factors influencing how people comprehend a graphic.

Chapter 9 considers how people interact with quantitative information, numbers, statistics, and probabilities, as they work to gain an understanding of a situation. It reviews issues of numeracy (number literacy), how people interpret statistics, and how they interpret risk information.

Chapter 10 considers how the presentation of information on a display affects the HII. The type and order of the presentation exert a strong influence on how people perceive and interpret information. This chapter connects and integrates the information of the previous three chapters as it reviews issues of information presentation, how people mentally handle presentation, and the effects of different ways of presenting the same information.

Chapter 11 considers how people read and comprehend information. The underlying psychological concepts of how people read can help design teams make clear content decisions and evaluate problem-
atic usability test results of technical information. It reviews basic reading and comprehension theory, how people form coherent mental images of a text, and how they make inferences.

Chapter 12 considers how people search for information across different texts and different display formats. It focuses on the forces that drive people to search for information and what mental processes are involved as they evaluate the findings in the course of reaching a stopping point. The chapter reviews models of how people search and the strategies they use.

Chapter 13 considers the factors that influence how a people use that information to make a decision. In the end, effective communication depends on people doing something with the information; a decision needs to be made and actions need to be taken. Decisions within an HII context never exist in isolation, but are embedded in the larger tasks that the decision maker is trying to accomplish. The chapter reviews how presentation affects decision making, different models of decision making, and the strategies people use.

Chapter 14 provides a conclusion that expands and fleshes out the HII model presented in chapter 1 based on the content of the book.

Michael J. Albers
East Carolina University, USA

REFERENCES


