QuikScan:
Facilitating Document Use Through Innovative Formatting

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A dissertation submitted in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

University of Washington

2008

Program Authorized to Offer Degree:
Department of Technical Communication

University of Washington
Graduate School

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Abstract

QuikScan: Facilitating Document Use Through Innovative Formatting

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Reading and seeking information in documents are among the crucial literacies of our time. Our ability to carry out these activities successfully is due to a long series of innovations in information design that go back thousands of years. Such innovations are increasingly valuable today.

This dissertation introduces an innovative format for print and online documents that I call "QuikScan." QuikScan employs summaries and highlighting to spotlight the superordinate ideas (or gist) of a document. It uses multiple within-document summaries to synthesize each section of a document. The summaries are typically formatted as numbered list items that correspond to the "target numbers" in the main body of text where the summarized items are elaborated fully. QuikScan enables readers to grasp the gist of a document and locate specific information efficiently.

Drawing upon the literature on information design, reading and reading signals, and summaries, this research presents the design of QuikScan, a design that can be applied to different document genres, different reader populations, and different

contexts of document use.

Two empirical studies are reported to demonstrate QuikScan's effectiveness on reading. The first study shows that QuikScan significantly improves reading comprehension and potentially enhances retention. The second study reveals that QuikScan significantly improves the efficiency of information seeking.

The main analysis of QuikScan centers on its rhetorical implications. Grounded on the rhetorical theories of author-reader relationships, this dissertation presents a multi-faceted view of the QuikScanner, the reader, and the QuikScan process. It demonstrates the rhetorical dynamics of QuikScan, frames QuikScan as a document intermediary, and discusses complex relationships facilitated by the document intermediary. Using QuikScan as a test bed, this research extends our understanding of author-reader relationships.

Additionally, this dissertation explores a number of special circumstances where QuikScan can be especially desirable, including assisting business meeting attendees, visually impaired readers, and RSS feed users. It describes the process of QuikScanning documents and presents important guidelines. In concluding, the dissertation highlights its major contributions to technical communication and discusses ideas for future research.

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PREFACE

My interest in information design can be traced back to the information design course I took in my first quarter of graduate study at the University of Washington. Taught by Professor David K. Farkas, who later became my advisor, the course led me into the fascinating realm of information design. Throughout my doctoral study, I have been exposed to various aspects of information design, from technological to social perspectives.

QuikScan: Facilitating Document Use Through Innovative Formatting is the result of this multidisciplinary and multidimensional endeavor. My dissertation presents a new document format—QuikScan—and explains the dynamic spectrum of its design, use, and implications. Striving for a balance between breadth and depth, I offer a comprehensive picture of QuikScan on both pragmatic and theoretical grounds. The dissertation is aimed at those who are interested in improving document quality and assisting document use.

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ACKNOWLEDGEMENTS

My deepest gratitude is to my advisor, David K. Farkas, for his unflagging support and fruitful guidance. His countless suggestions and generous commitment has not only helped me overcome numerous challenges, but also enabled me to become a scholar. Dr. Farkas has been a constant source of encouragement and strength. His mentorship will continue to play a significant role in my life.

This dissertation could have never been possible without the solid support from my supervisory committee, Mary Coney, Jennifer Turns, and Gerry Philipsen. I thank Dr. Coney for dedicating her retirement time to my scholarly growth and for giving me crucial guidance on rhetoric. Dr. Coney's advising has inspired my research interests; her support has been shaping my career development. I acknowledge Dr. Turns for her suggestions on the direction of this dissertation and her help on my teaching portfolio. I appreciate Dr. Philipsen's key comments on refining the empirical studies and the overall dissertation. I'd like to thank the Graduate School Representative, Professor Anis Bawarshi, for his enthusiasm about QuikScan and my research.

I am grateful to Beth Kolko, Judy Ramey, Mark Haselkorn, and Tom Williams. They have stimulated my scholarly interests in the areas of computer-mediated communication, usability studies, information management, and visual communication. Professor Jan Spyridakis provided critical assistance on research methods and guidance on human-subjects applications. Professor Mark Zachry gave me inspiring ideas on the rhetorical analysis of QuikScan.

Many of my research ideas were nurtured through constructive conversations with the members of the QuikScan Directed Research Group—Ariel van Spronsen, David Krizan, Erich von Heeder, Jessica Harrison, Kelly Lillis, Matt Carthum, Marita Graube, Niklas Nordlof, and Vijay Venkatraman. Kelly, Matt, Marita, and Niklas made important contributions to portions of this dissertation. I appreciate the exchange of ideas with Professor Hans van der Meij in the Department of Instructional Technology at the University of Twente in The Netherlands.

During a period of three years, other individuals participated directly or indirectly in the formation of this dissertation. I want to offer special thanks to Dan Comden and Zach Lattin at UW Access Technology Lab for helping me explore QuikScan's use for accessibility. Adam Barley, Eva Farkas, and Kiyong Lee participated in the pilot tests and offered important suggestions. Jean B. Farkas generously edited my writing and provided constructive comments. My gratitude goes to Susan Mings for letting me test and discuss QuikScan with her students. I thank Karen Kasonic for her support for my teaching. I'm grateful to Kent Sullivan at Microsoft Engineering Excellence for supervising my internship and supporting my job-seeking.

The Department of Technical Communication has provided precious intellectual support for my scholarly development and enabled me to realize my dream

DEDICATION

To my dear parents, Li Gong and Hongyuan Zhou.

Chapter 1: Introduction

Society is based on transactions enabled by communication processes. Much of our lives center round this, and our ability to function is often determined by the accuracy and best use of available information and knowledge. From the beginning of time, the skill and ability to process, decode, pass on, and utilize knowledge and information has been highly prized.
—David Finkelstein and Alistair McCleery

Every day a large amount of information reaches our eyes and ears from all corners of the world in many different formats and written for many purposes. The many text documents we receive—books, magazines, journals, advertisements, websites, and manuals—are carefully designed and formatted.

The business of creating new ways to assist information consumption can be traced back thousands of years (Eisenstein, 1979, 1983; Schriver, 1997; Pegg, 2002). Over a long period of time, various attempts have been made to improve document use through innovations in design (Kilgour, 1998; Eisenstein, 1979, 1983; Pegg, 2002). Ancient Egyptian scribes used red ink rubrication to help papyri users to look for information (Kilgour, 1998). The use of red ink distinguished content items and emphasized document structure (Posner, 1951; Kilgour, 1998). Various developments occurring in the Middle Ages and the Renaissance, especially with the advent of printing, culminated in the ascendance of *standard expository* documents (Farkas, 2005). Using the term *standard expository model*, Farkas (2005) characterizes standard expository (SE) documents as those that are primarily informational rather than expressive, intended to be read linearly. The hierarchical structure of the text is made explicit by the use of headings and (often) chapter divisions (Zhou & Farkas,

2007a). The SE structure is still the dominant and almost ubiquitous format for a vast variety of documents we use today (Farkas, 2005; Zhou & Farkas, 2007a). These include but are not limited to nonfiction books, technical reports, academic journal articles, and proposals. SE documents embed graphics in the text flow and use text adjuncts such as the table of contents, an abstract, sidebars, footnotes, appendices, and an index to supplement the body text (Zhou & Farkas, 2007a). Figure 1.1 shows an example of a standard expository document.
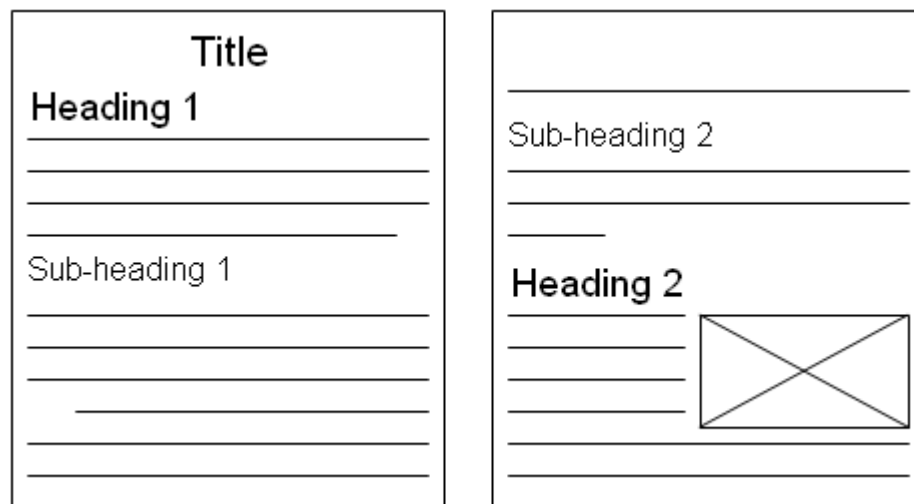
Figure 1.1 A standard expository document

Since the Renaissance, little has been done to improve the format of lengthy text documents. The SE model largely prevails—except for certain genres such as newspapers and magazines. Some practitioners and researchers in the field of information design have attempted to challenge the SE model by creating radically different formats. These new formats include Information Mapping[TM] (Horn, 1992; Farkas, 2005) and STOP[1] (Tracey, Rugh, & Starkey, 1965), both explained in detail

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[1] Sequential Thematic Organization of Publications

in Chapter 2. These formats significantly depart from the almost ubiquitously adopted

SE model; they substantially alter the appearance of SE documents and change the

way the content is read and used. On the one hand, these radically new formats

haven't become prevalent. On the other hand, because they disrupt SE documents,

readers of a large majority of today's documents do not directly benefit from these

formats. Innovative formatting that preserves the SE model is needed.

This dissertation introduces and analyzes a new document format called

QuikScan. QuikScan is meant to facilitate the reading of most SE documents without

radically disrupting their structure. In a nutshell, QuikScan uses multiple

within-document summaries and highlighting to emphasize the superordinate (key)

ideas of a document and spotlight subordinate but important details. The primary

component of QuikScan consists of the Boxed Summaries that appear throughout the

body of a document, most often after a heading. Each Boxed Summary summarizes an

upcoming expanse of text (up until the next heading or the next summary). Summaries

typically consist of numbered list items, normally written as sentences. Each list item

summarizes one of the superordinate ideas in the main body of text. The numbers that

precede each list item correspond to target numbers placed in the main body of text

where the summarized idea is discussed in full. A QuikScan summary with four list

items is shown in Figure 1.2.

1} Developing countries had been encouraged to manage price risk with market-based financial instruments and techniques. These are (a) basic forwards, (b) futures and options contracts, and (c) commodity-backed derivatives.
2} Forward contracts provide some (usually short-term) hedge against price risk but are not ideal hedging instruments.
3} Futures and options contracts are better because they are traded on organized international commodity exchanges.
4} Some countries have had success with commodity derivatives.

{1 Even before the collapse of the major price stabilization and compensatory schemes, developing countries had been encouraged to use market-based financial instruments and techniques to manage commodity price risk. This strategy involved the use of basic forwards, futures and options contracts and a wide range of commodity-backed derivative financial instruments. These tools were either tailor-made for specific transactions or traded publicly on international commodity exchanges.

{2 Forward contracts, which are used extensively by commodity producers in developing countries (usually through brokers and other intermediaries), provide some (usually short-term) hedge against price risk. However, because of these risks of default, and several other reasons discussed in more detail in the specialized literature, forward contracts and similar instruments are generally not considered ideal hedging instruments through which to offset commodity price risk (United Nations Conference on Trade and Development, 1994).

{3 Futures and options contracts, on the other hand, are considered better hedging instruments mainly because they are traded on organized international commodity exchanges such as the Chicago Board of Trade, the London Metals Exchange, the New York Mercantile Exchange, the Tokyo Commodity Exchange and commodity exchanges based in developing countries such as Argentina, Brazil, China, India, Malaysia, Singapore, South Africa and Thailand (in contract volume, the world's largest commodity exchange is now in the city of Dalian, China). Commodity exchanges operate with strict rules governing the financial solvency of traders, trading practices, contract settlement terms and other terms and conditions designed to guarantee and preserve the integrity of market operations.

Figure 1.2 A QuikScan Boxed Summary consisting of four list items

A second component of QuikScan is highlighting. Highlighting is typically used to spotlight less superordinate or subordinate information that is important for the target audience. For instance, a parenthetical reference in Figure 1.2 is highlighted. It is not included in the Boxed Summary for it is not considered superordinate content.

However, it is highlighted because it helps the target audience further study the source of certain content items. The design shown in Figure 1.2 is the simplest version intended to give a preliminary look at QuikScan. I give a complete description of QuikScan's many design components in Chapter 3.

I call QuikScan "new" not in a sense that it is nothing designers and readers have seen before. As Figure 1.2 shows, the components of QuikScan such as summaries, numbers, and highlighting have been used in many different types of documents one way or another. QuikScan is new in that it systematically incorporates existing formatting techniques such as summaries, numbering, and highlighting whose effectiveness is supported by the literature in information design, reading, and technical writing. When integrated together and applied consistently, these QuikScan components create a unique reading experience as I describe later in the dissertation.

The most prominent purpose of QuikScan is to help readers skim and scan documents effectively and efficiently. Preserving the standard expository structure, QuikScan enables readers to read the Boxed Summaries and obtain the gist of summarized each section and the gist of the entire document. Readers can choose to read the summaries in conjunction with the entire document. Using the numbered list items, they can conveniently locate particular items within each section of the main text. When necessary, readers can bypass portions of the original document or even all of it and read only the Boxed Summaries. As shown in Figure 1.3, when all Boxed Summaries are assembled together, they form a shortened version of the original document. QuikScan makes it possible for readers to skip "local" sections of a

document, stay on the "summary lane" until they see their target information, and follow the number in the summaries to reach their destinations in the main body of text.
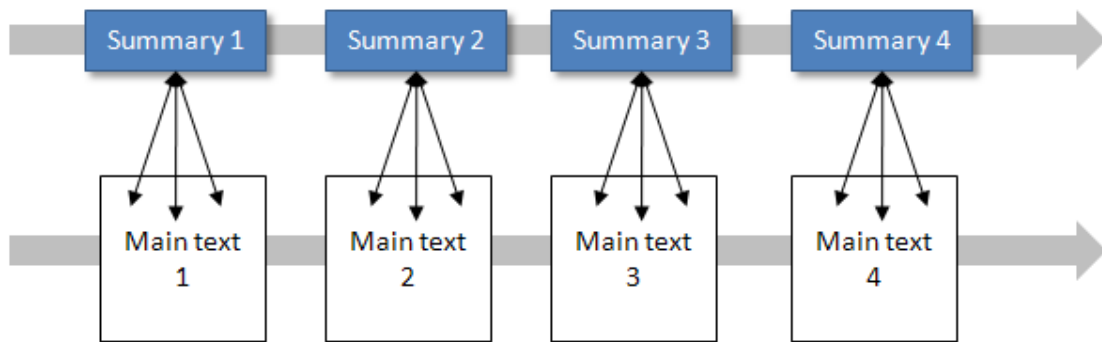
Figure 1.3 Reading QuikScanned documents

For example, a reader who reads the Boxed Summary shown in Figure 1.2 and is especially interested in futures and options contracts (list item 3) can easily jump from this list item to the more detailed information that follows the corresponding target number in the text. When documents are intended to be read on-screen, list items can be implemented as hyperlinks that help the readers jump to the locations of the corresponding target numbers.

1.1   Purpose of this Research

Broadly speaking, this research aims to create QuikScan and analyze it on both theoretical and practical grounds. I intend to add my own insights to the research, practice, and teaching of information design and technical communication generally. Specifically, my dissertation has the following goals.

First, I seek to further our endeavor in information design by introducing an innovative format for print and online documents. I show what QuikScan inherits from

existing design techniques and how it integrates them innovatively. I optimize the design of QuikScan for a wide range of print and online document genres and a variety of reading circumstances, particularly reading comprehension and information seeking.

Second, I validate the effectiveness of QuikScan for reading comprehension, retention, and information seeking. In doing so, I seek to present solid empirical evidence that characterizes the effectiveness of QuikScan and enable information designers to make the best use of QuikScan in their daily work.

Third, my research doesn't cease at creating a document format and validating its pragmatic effectiveness. While much information design research purely focuses on design, my dissertation analyzes the rhetorical implications of QuikScan. I explore what QuikScan means to our understanding of author-reader relationships.

A fourth goal is to explore the application of QuikScan in circumstances beyond general reading comprehension and information seeking. I emphasize that QuikScan is not simply a technique for general reading, but rather a process whose beneficial impact is broad and significant.

1.2   Areas of Investigation

The scope of this dissertation is ambitious. To achieve my goals, I undertook the following tasks:

Task Area 1: Using signals to improve document use—the design of QuikScan

Task Area 2: Validating the effectiveness of QuikScan on multiple reading

behaviors

    a. The effects of QuikScan on reading comprehension and retention

    b. The effects of QuikScan on information seeking

Task Area 3: Examining the rhetorical implications of QuikScan

    a. The roles of the QuikScanner and the reader of QuikScanned
documents

    b. The implications of QuikScan on our understanding of author-reader
relationships

Task Area 4: Exploring the applications and implementation of QuikScan

    a. Special areas where QuikScan can be desirably applied

    b. The QuikScanning process and guidelines

1.3   The Structure of the Dissertation

The broad structure of this dissertation is to introduce the conceptual
foundations of QuikScan, present QuikScan's design, demonstrate its effectiveness
empirically, analyze its rhetorical implications, explore its areas of applications, and
discuss its means of implementation.

Chapter 2, "Conceptual Foundations and Literature Review," lays out the
conceptual framework upon which QuikScan was developed. This chapter traces the
long tradition of information design including early attempts at book design and a
large variety of literature on information design theories, principles, and techniques.
It specifically discusses two important and innovative document formats (STOP and
IMAP) and analyzes their similarities and differences with QuikScan. It then provides

an in-depth review on the scholarly work on reading comprehension, retention, and information seeking. This review puts particular emphasis on the research on reading signals (e.g., headings, summaries, number signaling) that has informed the design of QuikScan most. Additionally, this chapter synthesizes a smaller but more specific body of research on summaries for such literature guided the design of QuikScan Boxed Summaries.

Chapter 3, "The Design of QuikScan," presents the components of QuikScan. First, I demonstrate the primary design components: summaries and highlighting. Second, I show extended design components. These extended components, while based on the primary design, are suited for different types of documents, different types of readers, and different contexts of document use. Finally, I explain the design solutions for using QuikScan on Web pages.

Chapter 4, "Empirical Validation," reports the findings of two empirical studies conducted to examine QuikScan's effects on reading comprehension/retention and information seeking respectively. These studies reveal that QuikScan enhances reading comprehension and facilitates efficient information seeking in relatively long expository texts, and potentially increases retention.

In Chapter 5, "Rhetorical Implications," I bring a rhetorical perspective to the analysis of QuikScan. Drawing upon pertinent theories on author-reader relationships, I demonstrate the multi-faceted roles of the QuikScanner and the QuikScan reader. I further reveal how QuikScan complicates, challenges, and extends our understanding of author-reader relationships. Chapter 5 fosters further conversations on the rhetorical

implications of innovative information design techniques that act as an intermediary between the author and the reader.

Chapter 6, "Special Applications of QuikScan," explains QuikScan's uses in several special circumstances. These are the use of QuikScan by business meeting attendees, visually impaired readers, and RSS (Really Simple Syndication) feed users. I report the findings from a visually impaired computer consultant who used QuikScanned documents on-screen and offered comments and suggestions.

Chapter 7, "Implementation of QuikScan," explains the QuikScanning process and provides preliminary guidelines on QuikScanning documents. I also present the materials for training readers and discuss the circumstances when using QuikScan could be unnecessary, ineffective, or inappropriate.

In Chapter 8, "Conclusion," I summarize the dissertation and highlight its major contributions to information design and technical communication in general. Then I identify the limitations of this research and provide recommendations for future work in QuikScan. Last but not least, I invite writers and readers to use QuikScan in their own documents.

As an ambitious dissertation, a number of chapters address largely different domains of knowledge. As such, these chapters accord with the academic traditions of their corresponding domains and reflect different assumptions. For instance, the rhetorical analysis of QuikScan works from an idealized view of how QuikScan operates and thus cannot be used as assumptions for the empirical studies.

Chapter 2: Conceptual Foundations and Literature Review

> *Learning how to represent information effectively requires us to travel*
> *along two complementary paths. One is the apprenticeship route, on*
> *which we learn from the example of current and past practitioners. The*
> *other path is the theoretical route, since understanding some theory*
> *and how to apply it—can shortcut much trial and error.*
> *—Jef Raskin*

As its name suggests, QuikScan is aimed at helping readers scan a document quickly, grasp its gist easily, and locate content items efficiently. It is informed by a wide variety of literature sources in various disciplines. I broadly categorize these literature sources into three areas: information design, reading and reading signals, and summaries. In this chapter, I present the most relevant literature in these three areas. This literature lays the conceptual foundation underlying the design of QuikScan.

Reviewing the literature in the first area, information design, has been a challenging process of investigating a large body of information design research that is dispersed through various disciplines. This is due to the fact that information design, though an old practice, is nonetheless relatively nascent as an academic discipline. I present relevant research on book design, document design, information design theories, principles, and techniques, and document usability as well as organizational and social aspects of information design. The second area of literature, reading and reading signals, informs the design of QuikScan to a significant degree and guides the two empirical studies on QuikScan reported later in this dissertation. Specifically, I present the literature on reading and information seeking and empirical research on a number of pertinent reading signals. The third area of literature, summaries, is a

narrower, but important conceptual foundation. This body of research is included because summarizing is the primary way QuikScan achieves its goals. In this area, I present the research on the purposes and effectiveness of summaries, writing effective summaries, and teaching and learning through summaries.

2.1   Information Design

Information design is becoming increasingly important in the realm of technical communication (Spinuzzi, 2003). It is a practice that has existed for a long time yet a field whose boundary is still being debated and studied (Dervin, 1999; Horn, 1999; Jacobson, 1999; Petterson, 2002; Carliner, Verckens, & de Waele, 2006). Although researchers have achieved a general consensus that information design is to facilitate the use of information by human beings (Campbell, 1995; Horn, 1999; Jacobson, 1999; Petterson, 2002; Carliner, 2006; Kimball & Hawkins, 2008), they have used many different terms to describe information design, including "document design," "graphic design," "message design," "text design," "layout design," "image design," and "communication design." These terms sometimes overlap with one another, and they have not been standardized for the most part. The differences among these terms, to some extent, reflect the different approaches researchers have taken to frame and examine information design. Graphic design, for example, has been largely considered as the field most closely associated to information design (Passini, 1999); much research has been done on the aesthetic appearance of information (Passini, 1999). Many researchers challenge such a position for they believe that information design focuses on communication and encompasses a wide variety of knowledge such

as human factors, psychology, cognition, and typography (Campbell, 1995; Passini,

1999; Horn, 1999; Petterson, 2002). Petterson (2002), in particular, believes that

information design is rooted in graphic design, education/instruction, and architecture

and engineering. Due to the multidisciplinary nature of information design, much

literature that can be considered as information design lies beyond the traditional

limits of the narrow definition (as graphic design, layout design, or document design).

Therefore, I believe that to assess the literature relevant to QuikScan, we must

consider a wider variety of research and practice on the use of documents and

information in general. In this section, I use "information design" as a broad umbrella

term to accommodate the literature on the pragmatic and theoretical aspects of the

design of books and documents in general. This multi-faceted body of literature is

presented first, for it directly informs the decisions made during the design of

QuikScan.

2.1.1 Book Design

To start my discussion on information design, I first explore relevant research

in book design. Book design, by and large, has been considered as outside the

traditional boundary of information design. Many book design issues have been

studied in the context of book history. However, this body of research sets an

important historical context for QuikScan.

Walking through book history, Kilgour (1998) demonstrates the evolution of

the book from incunables on clay in various regions of the world including Western

Europe, Egypt, and the Middle East to the electronic book. Focusing exclusively on

the West, Eisenstein (1979, 1983) explains the printing revolution in early modern Europe and its implications on the development of the book and the dissemination of knowledge in general. Finkelstein and McCleery (2005) expand the study of book history by examining authors, authorship, and authority in historical contexts. Pegg (2002) examines the history of text format and shows how print technology has preserved linearity. He examines the history of documents from providing oral cues before the invention of the print to the paragraph-and-chapter format that has persisted from the Renaissance to the present. As I have mentioned in Chapter 1, this paragraph-and-chapter format, shown in Figure 1.1, has been framed as the "standard expository model" and is the dominant format for a large variety of documents we use today (Farkas, 2005). This literature at the intersection between book history and book design may seem remote for some information designers. It is nevertheless inspiring for it shows that in order to improve the reading of a majority of today's documents, it is necessary to base new design upon the most popular and most ubiquitously used format—the standard expository model. QuikScan is not a document format taken out of context, nor is it a document format completely designed out of the blue. It is an innovation that derives from from a long tradition of book design.

In addition to book historians, many scholars in book studies focus specifically on the design of the book. Such attempts are typically concerned with the form of the book such as page design, typography, and binding (Tschichold, 1991). Tschichold (1991) focuses on the rules of typography as applied in books such as page typography, typesetting, leading, ellipsis points, and dashes. Identifying book design as a school of

thought, Hochuli and Kinross (1996) explain the general principles of book design

such as symmetry, assymmetry, kinetics, thickness, proportions, and double-page

spread. They examine the use of typefaces and the organization of images and texts,

and associate these design principles with such document genres as books of poetry,

play scripts, the Bible, illustrated literature, art books, scientific books, reference

books, and bibliophile books. This literature on the form of the book gives a general

background onbook design and provides some lesson in best practices. Next, I depart

from the literature on book design and move to the major body of research in

document and information design.

2.1.2 Document and Information Design

As I have mentioned, research related to information design has been given

different names by scholars in various disciplines including technical communication,

graphic design, psychology, linguistics, architecture, and computer science (Horn,

1999; Carliner, 2006). Among them, "document design" is typically associated, and in

some cases used interchangeably, with "information design." There have been debates

on the differences between document design and information design. Many have

viewed document design as a sub-field of the broader field of information design

(Carliner, 2000, 2006; Kimball & Hawkins, 2008). Carliner (2000) asserts that

document design focuses on the physical look and feel of documents while

information design entails the overall meaning-making of text. However, Schriver

(1997) considers document design as a broad field that certainly stretches beyond the

limits of the physical appearance of documents. Schriver (1997) not only examines the

features and techniques of document design, but also the rhetorical contexts of

document use and the interaction between readers and documents. Carliner (2006)

acknowledges that the boundaries between information design and document design

have become fuzzier in recent years; one indication of this trend is the merging of two

major journals *Information Design Journal* and *Document Design* (Carliner, 2006).

This discrepancy of terminology led me to consider "Document and Information

Design" as one whole section that entails all the relevant research. This is to maintain

the unity of the literature and to avoid artificially separate scholarly work that is

related to one another. In this section, I first present a specific body of research on

document design. Then, I discuss the information design theories, principles, and

techniques that have informed QuikScan. Third, I focus on two innovative document

formats that have attempted to improve the use of documents. These two document

formats are presented because they are among the few attempts that challenge the

standard expository model. QuikScan resembles and differs from them in significant

ways. Fourth, I present the literature on document usability and discuss the

organizational and cultural aspects of information design.

Document Design

In her landmark book, *Dynamics in Document Design*, Schriver (1997) defines

document design as "a field concerned with creating texts (broadly defined) that

integrate words and pictures in ways that help people to achieve their specific goals

for using texts at home, school, or work " (p. 10). Schriver (1997) explores document

design in three aspects. First, she traces the evolution of document design as a field.

She puts document design in historical and social contexts by exploring the influence

of technological developments, education and research in rhetoric, writing, graphic

design, and typography, and professional developments in writing and design. She

identifies traditions in visual communication, romantic writing, and rhetoric that have

shaped contemporary document design. Schriver (1997) chronicles the development of

the document in the twentieth century in the context of the five factors that have

significantly affected and even revolutionized the design of documents: (1) education

and practice in writing/rhetoric, (2) professional development, (3) education and

practice in graphic design, (4) science, technology, and environment, (5) society and

consumerism. Unlike many other document design researchers who focus solely on

the form of the document, Schriver (1997) shows the interaction between documents

and society. Such a context has always been important in my design and analysis of

QuikScan. As I shall describe in the upcoming chapters, QuikScan is envisioned to

improve the use of documents in social contexts.

Second, Schriver (1997) probes how readers respond to texts, pictures, tables,

typefaces, and a vast variety of document features. She emphasizes that the reader's

background and knowledge has a significant impact on their use and interpretation of

document features. Third, Schriver (1997) discusses how document designers should

respond to readers' needs and tailor document design accordingly. She introduces a

number of methods such as usability testing to probe user needs. Schriver's book

provides both theoretical and practical guidance to QuikScan. Her comprehensive

survey of the theoretical foundations of document design, particularly those on

empirical research, rhetoric, cognition, and design theory, has helped me conceptualize QuikScan, rhetorically analyze QuikScan, and empirically study QuikScan. Her practical guidelines on using document features have informed the design of QuikScan in a number of ways. For example, Schriver (1997) points out that navigating complex documents is a learning process in which a reader familiarizes herself with the norms and conventions of the genre, media, and the means of presentation. When encountering unfamiliar conventions, therefore, a reader may not be able to effectively interpret document features (Leinhardt, Zaslavsky, & Stein, 1990; Schriver, 1997). This approach supports the purpose of QuikScan, that is, to largely preserve the structure of the original document. This approach also implies that while being innovative, the QuikScan components (summaries and highlighting) must be intuitive and easy to interpret. Some of the theories and guidelines addressed in Schriver's book coincide with many other research studies, which are discussed in more detail later in this chapter.

Tracing the history of information design, Horn (1999) assesses the significant contributions made by information design practitioners over the years. He categorizes these contributors as inventors, systematizers and analysts, univeralists, collectors, writers of instruction manuals, aestheticians, and popularizers. Inventors such as William Playfair, Florence Nightingale, Michael George Muhall, Otto Neurath, David Sibbet, James Beniger, and Dorothy Robyn, contributed to the emergence of various types of charts and graphics including pie charts, bar charts, quantitative charts, and statistical graphics (Horn, 1999). Systematizers and analysts such as Jacques Bertin,

Gui Bonsiepe, Scott McCloud, Will Eisner, Willam Bowman, and Michael Twyman,

took the inventors' endeavor further by systematically analyzing different types of

graphic language (Horn, 1999). Universalists such as Margaret Mead, Rudolf Modley,

and E. K. Bliss attempted to produce iconic language to make information

internationally recognized (Horn, 1999). Collectors such as Henry Dreyfus, Philip

Thompson, and Peter Davenport put together comprehensive icons and images in a

reference format for other designers (Horn, 1999). Influential manual writers such as

Robert McKim, Stephen Kosslyn, Gene Zelazny, and Gary Glover considered the use

of visual language in problem-solving (Horn, 1999). Aestheticians such as Edward

Tufte studied the ways to make communication useful and visually appealing (Horn,

1999). Popularizers such as Stephen Baker, David Macaulay, and Richard Wurman

brought information design into the practice of mass media (Horn, 1999). These

contributors have constructed the backbone of information design, and their

contributions have been widely used in document design practices. At the same time

the work of many of these individuals does not directly inform QuikScan and thus is

not elaborated upon. Next, I focus on the theories, principles, and techniques of

information design that have shaped QuikScan.

Information Design Theories, Principles, and Techniques
There is a vast body of research on information design principles, theories, and

models, much of which is concerned with the use of such techniques as color and

arrows. Some scholars address the cognitive aspects of information design, while

others focus on perception. Because little effort has been made (to my knowledge) to

systematically categorize these dispersed pieces of research, I treat them as a whole

here and focus on those that have most informed QuikScan.

Pettersson (2002), in his textbook *Information Design—An Introduction*,

provides a comprehensive examination of information design that encompasses the

design of text messages and visuals. Pettersson (2002) identifies a number of major

information design principles:

Facilitating interpretation and learning: information design needs to attract

readers' attention and enhance readers' perception and memory. An important way to

facilitate reader perception is to differentiate design items.

Information structure: text messages and visuals ought to be clearly structured

in order to help readers discover, process, and make good use of information.

Clarity: text and visuals must be legible. Designers need to distinguish items

and set satisfactory contrast.

Simplicity: information designers must produce concise, clear, and precise texts

and readable visuals.

Unity: information designers need to align texts and graphics and set

appropriate page layout to achieve "overall togetherness."

Securing quality: the content of information products ought to be correct and

accurate. Expert knowledge is important in ensuring the accuracy of terminology the

appropriateness of style, and the consistency of language.

Limiting the total costs: The time expended in reading and processing

information sometimes can be more costly than producing information. Therefore,

effective design ought to facilitate the efficiency of processing information products and reduce the costs of document use. QuikScan is a prime example of accepting higher design and production costs in the interests of reducing the time professionals must spend reading and working with documents.

Design principles like these apply general theories into the pragmatic practice of information design. They have helped me make QuikScan salient, simple, clear, and intuitive.

Carliner (2000) suggests three levels of information design: physical, cognitive, and affective. The basic level of information design is concerned with the physical representation of information such as visual layout and writing (Carliner, 2000). The second level of information design, the cognitive level, deals with how well an information design object is structured and how effective it is in helping readers digest and interpret information and solve problems (Carliner, 2000). The third level, affective, is about giving readers confidence and helping them gain satisfaction (Carliner, 2000). Carliner's (2000) theory implies that information design goes beyond the simple act of "design." It's about the ultimate reader experience.

Kimball and Hawkins (2008) draw upon Jacques Bertin's (1983) seven visual variables and adapt them to the design of documents: shape, orientation, texture, color, value, size, and position. They propose six basic principles that help information designers manipulate design objects: similarity, contrast, proximity, alignment, order, and enclosure. First, design objects that are similar in shape, size, and color should be consistently treated in the same way (Kimball & Hawkins, 2008). For example, each

Boxed Summary in QuikScan is formatted as a visually similar box with the same score line and background color (light turquoise). Most summaries appear consistently after a heading, summarizing the upcoming expanse of text. Second, design objects must achieve a satisfactory contrast to indicate differences in function and meaning (Kimball & Hawkins, 2008). For example, the box and background color of QuikScan summaries help distinguish these summaries from the main body of text. Because summary text is typically numbered, each summary list item preceded by a numbercorresponds to the same number in the main body of text where the summarized item is explained in full. To make it easy for readers to find these target numbers, I use turquoise color as a background for all target numbers so that they can be easily identified. Third, design objects must achieve close proximity to indicate grouping and belonging (Kimball & Hawkins, 2008). We can consider, for example, the box around the QuikScan summary as an attempt to group summary items and achieve unity and proximity. Fourth, design objects ought to be aligned to maintain coherence (Kimball & Hawkins, 2008). For instance, all the numbered list items in a Boxed Summary are aligned. If a list item runs onto a second line row or more, all lines are aligned with the first line. Fifth, information designers may consider organizing information sequentially. By numbering the summary items, QuikScan enables readers to locate particular information by their unique and sequentially numbered "address." Sixth, when separating design objects, designers need to use enclosures such as boxes or tables (Kimball & Hawkins, 2008). Such an enclosure can be seen in every QuikScan summary.

One of the most frequently used theories in information design is the Gestalt Theory. Gestalt psychology, introduced by such scholars Max Wertheimer, Wolfgang Kohler, and Kurt Koffka (Moore & Fitz, 1993), "tries to understand how viewers perceive wholes in groups of individual elements" (Moore & Fitz, 1993, p. 390). According to Kimball and Hawkins (2008), Gestalt Theory departs from the neurophysiological approach toward human perception that focuses on individual parts and instead emphasizes the whole and holistic experience. Moore and Fitz (1993) adapt the Gestalt theory in document design by identifying a number of its core principles including figure-ground segregation, symmetry, closure, proximity, good continuation, and similarity. Because some of these principles have been addressed in my earlier discussion, I focus here on figure-ground segregation and good continuation.

Figures can only be identified and perceived when they are distinguished from their backgrounds (Moore & Fitz, 1993). In a QuikScanned document, for instance, we may consider the pages of the original document as the ground and the colored Boxed Summaries as the figure. Such a figure-ground discrimination is achieved through the use of a colored box that encloses each QuikScan summary. The law of good continuation implies that figures that are related ought to be organized to suggest an intuitive relationship (Kimball & Hawkins, 2008). In QuikScan, the numbers in the Boxed Summaries and the target numbers in the main body of text appear in similar formats. This is to suggest a relationship between summary items and their target locations. From what I found in the pilot tests and empirical studies, readers have been

able to immediately understand the relationship between the numbers that precede summary items and these corresponding target numbers in the main body of text.

Grounding his work on the Gestalt Theory, Campbell (1995) proposes a theory of coherence, continuity, and cohesion in document design. Specifically, Campbell (1995) identifies four principles of coherence in the discourse of document use: information should be relevant and connected (continuity); information should be conveyed in a clear way (manner); information should be adequate but not redundant (quantity); information ought to be accurate (quality). Much of Campbell's research focuses on such writing issues as sentence structure, organization of paragraphs, and development of ideas. The focus of QuikScan, however, is not solely on writing but also on the way summaries and highlighting are used. Nevertheless, the value of Campbell's theory to QuikScan lies in the following two aspects. First, the principles of coherence suggest that, within each QuikScan summary, the list items ought to be treated not as independent from but connected with one another. Second, the principles of coherence suggest that, for the whole QuikScanned document, the QuikScanner must not simply treat each summary as independent but rather see the "wholeness" of all summaries. This coincides with the possibility of QuikScan summaries to be read separately from the main body of text. If readers want to skip the original document, they must be able to understand the connections among the Boxed Summaries in order for the summaries to be the primary reading material in place of the original document.

In addition to visual design theories such the Gestalt Theory, researchers have

applied cognitive theories in information design. Gribbons (1991) points out six filters

that shape how a reader decodes an information product: schema, cognitive style,

culture, perceived significant of visual elements, limitations of neurological and

cognitive capacity, and information overload and distractions. Regarding schema,

Gribbons points out:

> One of the strongest influences on the readers' processing of visual
> information is their prior knowledge or schemata. A schema functions
> as a universal system of background relationships representing objects,
> events, and concepts that form the foundation of meaning. For the
> reader schema availability includes knowledge of the information
> communicated as well as knowledge and experience with various
> graphic conventions and format styles. This knowledge might include
> experience with charts, graphs, and schematics; iconic representations;
> typographic and color conventions; and style formats for different
> categories of graphic products. Without these schemata, the reader
> would have tremendous difficulty processing visual displays. Although
> information designers cannot control the readers' prior knowledge of
> the information being communicated, they can design the information
> to be maximally compatible with the users' knowledge of graphic
> conventions. In doing so, they improve the conditions for effective
> communication. (Gribbons, 1991, p. 44)

Document format is an important and influential visual schemata (Gribbons,

1991). Information design should adhere to the reader's habits and expectations in

order to be most effective (Gribbons, 1991). If an innovative document format does

not fit with the reader's existing schema, it is unlikely to achieve its goals (Carver,

1970; Wright & Threlfall, 1980; Duffy, Curran, & Sass, 1983; Gribbons, 1991). This

might explain the reason why many innovative document formats like STOP[TM] and

IMAP[TM], as I shall explain later in this chapter, weren't widely adopted. These

formats substantially challenge the standard expository model, the dominant format of

a vast majority of books and documents. Therefore, it can be very difficult for readers, who are used to standard expository documents, to adapt to these innovative formats. During the design of QuikScan, the standard expository model was considered as a basis in order to make QuikScan as applicable as possible to all kinds of documents. I strived to make QuikScan an enhancement technique that accords with the reader's existing schema instead of a challenger that overthrows familiar document structures. I also attempted to make it intuitive for editors to adopt QuikScan.

In addition to document format, Gribbons (1991) characterizes the filter of cognitive style as an influential factor in the reader's overall document use. Cognitive style, as Gribbons (1991) points out, refers to reading strategies and learning styles. Readers do not take the same approach reading all documents; instead they take a variety of strategies to achieve their respective goals (Gribbons, 1991). For example, readers may read for the general drift of a package (skimming), for quickly finding specific information (scanning), for locating the meaning of specific items (search reading), for thorough comprehension (receptive reading), and for evaluation (critical reading) (Pugh, 1978). Since each of these reading strategies reflects different reading goals, information designers should adjust their use of design techniques to accommodate readers' distinctive needs.

Another filter Gribbons identifies is the limitations of the processing system, particularly short-term memory (STM; also known as operative memory or working memory). Short-term memory determines how well a reader processes a document and remembers its content (Gribbons, 1991; Petterson, 2002).

> Short-term memory is typically of limited duration, with unrehearsed information typically decaying within twenty seconds. In addition, short-term memory has a finite capacity, typically somewhere between 4-7 categories of information at one time. (Gribbons, 1991, p. 46)

To facilitate the comprehension and retention of documents, information designers ought to help readers transform short-term memory into long-term memory (Gribbons, 1991; Petterson, 2002). Petterson (2002) mentions that one way to facilitate such a transformation is to repeat information:

> Information that has entered the short-term memory can proceed through a filter that selects the information to be passed on to the long term memory. Once this filtration has taken place and certain information units have been assigned priority over others, these priority units are given access to a "register" with a limited memory capacity. This is when a person becomes aware of the stored information. All other non-priority information disappears, normally forever if it is not re-transmitted to the filter when the filter is able to accept the traffic. (Petterson, 2002, p. 236)

Gribbons (1991) points out that "[v]isual displays that exceed the maximum channel capacity, or displays that force the reader to retain information for longer than twenty seconds are significantly less effective" (p. 46). Therefore, another way to help readers transform short-term memory into long-term memory is through organizing and chunking information (Miller, 1956). QuikScan summaries identify priorities of reading—the superordinate information of the original document—and chunk these superordinate ideas into Boxed Summaries. These Boxed Summaries strengthen the memory of superordinate ideas in the reader's mind and thus improve retention.

Applying cognitive theories in information design, Gribbons (1991) explains that document design produces three effects: legibility, ergonomics, and aesthetics.

These effects are represented in his information design model shown in Figure 2.1. Gribbons (1991) believes that "[t]o produce the optimum layout, the designer must establish priorities at the outset of the design process based on rhetorical intent, the needs and expectations of the reader, and the capabilities of the medium" (p. 47).
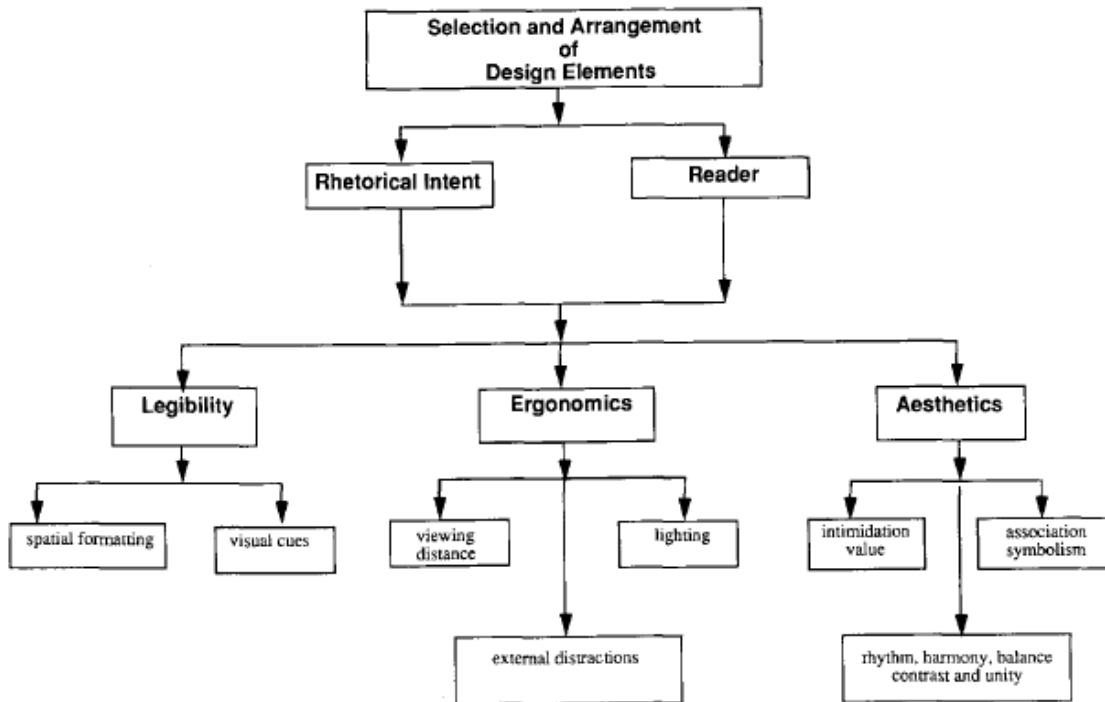
Figure 2.1 The information design model (Gribbons, 1991, p. 48)

Here, I elaborate on his viewpoint regarding legibility because it closely relates to QuikScan. Legibility, as Gribbons (1991) puts it, is "the speed, accuracy, and ease of visually receiving and comprehending meaningful continuous text" (p. 47). In order to improve legibility, designers can use such cueing techniques as typefaces, sizes, boldface, color highlighting, and spatial formatting (Gribbons, 1991). "By emphasizing important information, cueing techniques enable the sender to more effectively communicate rhetorical intent." (Gribbons, 1991, p. 47) Specifically,

Gribbons (1991) suggests four factors that determine the effectiveness of such cueing:

> First, the cues must be compatible with the reader's perception of perceived significance, i.e., size, value, texture, color, orientation, and shape. (p. 47)
> ………………………………………………………………………
> Second, while determining the optimum level of redundancy in the structural system, the information designers should not exceed the limitations imposed by the reader's short-term memory… (p. 47-48)
> ………………………………………………………………………
> Third, although cued material is more fully comprehended, … this effect is achieved at the expense of the uncued material. (p. 48).
> ………………………………………………………………………
> Fourth, in using color cues, the information designer must accommodate the limitations imposed by color anomalies. (p. 47-48)

The third factor is rather intriguing for it shows that there is an important tradeoff information designers need to assess when "cueing" documents. As I shall show in Chapter 4, one of the empirical studies reveals that QuikScan may help readers rapidly seek superordinate information cued by QuikScan but may cause them to give less attention on other information that is not cued by QuikScan.

On color, Gribbons (1991) points out that different shades of color should be used carefully to help distinguish items. The use of color and contrast should contribute to the overall visual harmony (Gribbons, 1991). Kimball and Hawkin (2008) point out that "humans can perceive light in a small range of wave-lengths between 700 and 400 nanometers (nm)—what is called the visible spectrum" (p. 248). When using color, information designers must consider hue, saturation, and brightness to make design objects outstanding (Kimball & Hawkin, 2008).

Winn (1991) identifies five functions of color in documents: directing attention, delimiting shapes and areas, clarifying complex ideas, facilitating identification, and

creating affect (p. 182). One reason to use color in document design is that color can be processed attentively and preattentively (Winn, 1991). According to Winn (1991), color "communicates, for the most part, preattentively and does not require cognitive effort from the viewer in order to be meaningful" (p. 181). This makes color a desirable choice to enable readers quickly detect objects in visual display (Winn, 1991; Ware, 2004). Meanwhile, color can also be processed attentively and used for attention-directing (Dwyer, 1978, 1987; Winn, 1991). Color can be used to not only highlight words, but also emphasize chunks of texts (Winn, 1991). Winn even suggests that "summary statements in a manual might be indented or printed in a box, and at the same time printed in a different color or on a different background" (p. 183). This is exactly what QuikScan does. Color not only helps clarify information and makes it easier to identify elements, but also increases reader's emotional engagement (Winn, 1991). "By and large, people tend to like colored materials more than they do bichromatic graphics and text." (Winn, 1991, p. 184) These theories about color have given me confidence that the use of color in QuikScan will help achieve its goal of improving reading and, especially, information seeking.

At the same time, Winn (1991) notes that using too many colors can lead to the extensive use of cognitive resources like search and memory and thus can distract the reader's attention. If some aspect of the visual display of a document, such as color, exceeds the reader's maximum cognitive capacity, the document is unlikely to be restored to the reader's long-term memory (Gribbons, 1991). According to Winn (1991), "[w]hen more colors are used, or when features differ in color and at the same

time in shape or size, then the effect of the contrast is attenuated" (p. 183). Therefore,

two colors may be adequate in distinguishing items (Winn, 1991).

> The reason for this is that, ..., when a feature differs in just one way
> from the others, it can be detected through parallel processing, which is
> exremely rapid and effortless. When features differ in more complex
> ways, it is necessary to inspect each one in turn in order to determine
> which is which [Serial processing] (Winn, 1991, p. 183)

In addition to color, many other objects can be processed preattentively

including orientation, abox placed around an object, and basic shapes (Ware, 2004).

These objects enable readers to process documents rapidly and to capture vital

information (Ware, 2004). The theories in preattentive processing have been important

for the design of QuikScan. The way the Boxed Summary was designed reflects my

intent to make QuikScan salient and easy to use.

A number of researchers have studied the design for procedural information

(Szlinchcinski, 1979, 1980; Horton, 1994; Milner & Goodale, 1995; Tversky, Zacks,

Lee, & Heiser, 2000; Inaba, Parsons & Smillie, 2004; Krull & Sharp, 2006). They

have explored design strategies such as icons, diagrams, illustrations, lines, blobs,

crosses, and arrows to improve instruction manuals. Among these design strategies,

arrows are most relevant to QuikScan for QuikScan Boxed Summaries use braces that

resemble the function of arrows. Arrows are largely used to effectively depict the

direction of movement (Szlinchcinski, 1979, 1980; Tversky et al., 2000; Krull &

Sharp, 2006). Tversky et al. (2000) point out that illustrations can be interpreted

statically without arrows. "When arrows are added, users not only try to understand

how parts interact, they also frame their understanding in terms of their personal role

as agents of action." (Tversky et al., 2000, p. 191) Considering arrows as "visual verbs," Krull and Sharp (2006) point out that arrows enable users to better connect the action depicted in a procedural illustration with their own bodies. As I have noted in Chapter 1, each QuikScan Boxed Summary is typically connected with the main body of text through numbers: each numbered list item in the summary corresponds to the same number in the main body of text where the summarized item is elaborated. Since a primary goal of QuikScan is to enable readers to locate information, I use a right-pointing brace next to each number in the summary and a left-pointing brace next to each target number in the main body of text in order to suggest a correspondence between them.

In this section, I have introduced a number of information design theories, principles, and techniques that are most pertinent to QuikScan. Many techniques, including colors, arrows, and boxes, are meant to supplement documents that fit with the standard expository model—the norm for a vast majority of documents we use. However, there have been many attempts to create entirely new document formats that substantially alter the standard expository model with the intent to dramatically improve document use. Two prominent results have been the Sequential Thematic Organization of Publications (STOP^{TM}) and Information Mapping^{TM} (IMAP). On the one hand, these radical document formats have inspired and informed the design of QuikScan. The development of QuikScan, to a certain extent, resembles the emergence of STOP and IMAP in that QuikScan is another attempt to benefit people's use of documents in a systematic manner. On the other hand, QuikScan significantly

differs from STOP and IMAP. For these reasons, I devote the next section introducing

STOP and IMAP and comparing them with QuikScan.

STOP and IMAP

STOP, or Sequential Thematic Organization of Publications, was created by

Tracey, Rugh, and Starkey (1965), members of the Hughes-Fullerton division of

Hughes Aircraft (Farkas, 2005). "STOP is a systematic method of organizing and

writing the technical report and proposal which significantly improves outlining

control and editorial caliber of the content." (Tracey et al., 1965)

Generally speaking, the STOP format divides a document into modules, each

of which addresses a single topic (Farkas, 2005). As shown in Figure 2.1, each module

consists of two facing pages. A module starts on the left-hand page with a heading, a

title beneath the heading, and a thesis statement beneath the title (Farkas, 2005). A

visual, if applicable, appears on the right-hand page (Farkas, 2005). "A STOP module

should consist of between 350 and 1,000 words, with 500 words being the target

length." (Farkas, 2005, p. 19) One advantage of STOP, as Farkas (2005) observes is

that it forces writers not to produce lengthy passages governed by a single abstract

heading (like most standard expository documents). Another advantage is that STOP

enables readers to skim the headings, titles, and concise thesis statements to preview a

module without having to read the whole document However, the rigid structure of

STOP substantially changes the structure of standard expository documents and alters

the flow of reading.

The STOP report [Tracey et al., 1965], which is itself a STOP
document, both propounds STOP and mounts a comprehensive attack

on the SE model. The STOP report authors argue that the SE model is inherently dysfunctional for all but literary writing and that both readers and those who write and edit documents benefit greatly by adopting STOP…there is merit in many of the key STOP concepts, and the STOP report still holds considerable value for the study of technical communication. (Farkas, 2005, p. 18)

While STOP may have some theoretical significance, its implementation requires an extensive amount of work and may not be feasible on a variety of documents. It is certainly less feasible in the real world where document design is subject to budget and time constraints.

Figure 2.2 A STOP (Sequential Thematic Organization of Publications) module

Another document format that substantially challenges the standard expository model is Information Mapping[TM] (IMAP), or structured writing (Horn, 1999; Farkas, 2005). Born in the same year as STOP, IMAP was develop by Robert Horn and is considered as foundational to information design Horn (1999) believes that the

paragraph is not the best unit of display in documents. "Writers work without clear principles that tell them when to start a new paragraph or what a paragraph should contain." (Farkas, 2005, p. 16) Instead, Horn (1999) uses information blocks to chunk information in a way that is visually distinct. Seven principles were applied in IMAP including chunking, a hierarchy of chunking and labeling, relevance, consistency, labeling, integrated graphics and accessible detail (Horn, 1969, 1976, 1985; Jansen, 2007). Figure 2.2 shows an example of IMAP. "Information maps typically consist of seven plus or minus two information blocks, reflecting in part George Miller's seminal work on the limits of human short-term memory." (Farkas, 2005, p. 16)

 Unlike standard expository documents, the display-unit of IMAP documents has salient page boundaries (Farkas, 2005). In standard expository documents, readers follow headings and subheadings and therefore, may not notice page transitions; in IMAP formatted documents, by contrast, readers are attracted to the information chunks on a page (Farkas, 2005). IMAP can be especially beneficial for documents that are typically skimmed and scanned by readers (le Pair, Jansen, Korzilius, van Gerdingen, de Graaf, & Visser, 2007). IMAP may also help unskilled writers to produce well-structured documents (Farkas, 2005).

Figure 2.3 An information map consisting of the information blocks Problems, Example, Solution, Caution, and Procedure (Farkas, 2005, p. 17)

Researchers have sought to empirically examine the effects of IMAP. Jansen (2002) found that readers who used IMAP did not perform significantly better in information retrieval than those without IMAP. However, as Jansen (2002) and le Pair et al. (2007) note, the effectiveness of IMAP may be more apparent on longer texts and used by readers who are familiar with IMAP. Carel Jansen, along with Rob le Pair, Hubert Korilius, Jolanda van Gerdingen, Susanne de Graaf and Rentia Visser (2007) furthered their research by testing IMAP on relatively long text. They found that

readers who used IMAP performed significantly more effectively and efficiently than those with the conventional text version and also exhibited a great overall appreciation of IMAP. They did not, however, find significant difference in performance by those who are familiar and unfamiliar with the IMAP format.

STOP and IMAP are two important innovations in document design that emerged in the middle of the 20th century. They have provided anecdotal and experimental evidence in support of QuikScan. QuikScan resembles STOP and IMAP in that it is aimed at facilitating reading comprehension and especially information seeking. The thesis statement in a STOP module functions as a summary that summarizes the superordinate ideas of the upcoming expanse of text. The chunking of information in IMAP makes it easy to distinguish content categories and conveniently seek information. These chunks are similar to the Boxed Summaries in QuikScan.

To a large extent, STOP and IMAP also differ from QuikScan. First of all, both STOP and IMAP substantially challenge the standard expository model while QuikScan only supplements standard expository documents. Second, because of the radical changes mandated by STOP and IMAP, a significant amount of writing and formatting is required in order to implement them. This lack of flexibility makes it less feasible to widely use STOP and IMAP in everyday documents that are used in all kinds of contexts. QuikScan, by contrast, preserves the headings, subheadings, and the hierarchy of the original document. Third, while STOP and IMAP are intended to assist information seeking, neither of them provides the level of granularity of information seeking like QuikScan. STOP, for instance, only provides a high-level

thesis statement which does not itemize superordinate ideas and does not enable

readers to locate specific information. IMAP does make it easier for readers to

understand the different categories of information, but does not help much in

information seeking. In contrast,by using the numbers in QuikScan summaries,

readers can not only quickly obtain the gist of each local section but also accurately

locate each summarized superordinate idea.

A more recent innovation in document design, although less relevant to

QuikScan, is Visual-Syntactic Text Formatting (VSTF). VSTF uses computer

algorithms to break a document into short phrases that adhere to the natural phrase

boundaries of the syntax (Walker et al., 2007). Since it is a computer-based technique

that radically changes the appearance of sentences (and thus documents), it does not

directly inform the design and analysis of QuikScan.

Document Usability

An important component of document design is evaluating document usability.

Researchers in the past two decades have been demonstrating the meaningfulness of

studying document usability (Velte, 1989; Ramey, 1991; Spencer, 1996; Schriver,

1997; Novick & Ward, 2006).

Nowadays, software companies, website teams, and product designers

increasingly value the importance of user feedback and have employed creative ways

to probe how users use products. The approaches in studying software usability lend

themselves in document design (Velte, 1989). Adapting a software usability approach

on a hypothetical information product, Velte (1989) proposes a number of steps to

identify document usability objectives: state the problem, propose a solution and asses

its feasibility, identify and define the users, identify and analyze the tasks, identify and

assess the usability needs, and set measurable objectives.

Schriver (1997) believes that empirical and iterative methods can enable

document designers to effective probe reader needs and improve document quality. In

a study of the manuals of a Japanese-made VCR, Schriver (1997) found that while

design experts identified some problems in written prose, visual design, translation,

and product design, usability testing involving real users revealed additional

difficulties users experienced. Interestingly, Schriver (1997) found that the design

experts falsely predicted potential problems users may experience, demonstrating that

involving users is vital for the success of document design. Novick and Ward (2006)

investigate user needs in documentation through interviews. They found that the

easiness of searching for information, the convenience of navigating, and the presence

of accurate illustrations and scenarios are important factors that lead to user

satisfaction. Dillard (1992) showed that rapid prototyping (on low-fidelity prototypes)

is an effective method to study documentation usability in the early phase of design.

Spencer (1996) identifies common problems in document usability. He points

out that users sometimes don't understand the purpose of a document. Because the

document is poorly organized, users may not realize the availability of certain

information and may find it hard to search for information (Spencer, 1996). Users also

suffer from inconsistent use of format such as typefaces and color (Spencer, 1996).

Spencer (1996) suggests that internal usability review can be an effective and

inexpensive way to prevent usability problems before real users involve in testing. In internal usability review, product teams participate in identifying baseline and benchmark standards to study documentation (Spencer, 1996).

Yeats (2004) presents a case study on how usability findings helped a software team change their documentation deliverables. He emphasizes that revising documents based on usability findings is not a one-time activity but an iterative process. Document designers work with usability specialists to incorporate short-term and long-term concerns into phased revisions (Yeats, 2004).

These studies of usability indicate best practices in evaluating documents. In my discussion of the QuikScan process (Chapter 7), I shall explain the iterative process of evaluating QuikScanned documents. In Chapter 5, I discuss the rhetorical aspect of involving readers in the production of QuikScanned documents.

Organizational and Cultural Perspectives

Another body of research in information design is on organizational and cultural issues. This body of research is peripherally related to QuikScan. However, because of their organizational and cultural focus, they provide a basis for my decision to design QuikScan so as to accommodate the dynamics in social settings because after all, QuikScan is likely to be a collaborative business process and is envisioned to assist business meetings.

de Stadler (2007) explores the role of management and stakeholders in the document design process. Through two case studies, he points out that document design is not solely made possible by excellent writers and effective designers, but by

a team of stakeholders, managers, and decision makers whose opinions determine the

success of a particular document design project. Document design, in the business

world, is a collaborative process and its importance must be recognized within an

organization (de Stadler, 2007). Clay Spinuzzi (2003) focuses on the information use

by workers and examines the interactions among workers, information systems, and

tasks. He demonstrates the need for designers to partner with workers and deliver

information design more adoptable by workers. While Spinuzzi examines document

use in organizations in the United States, Sless (2004) shares his experience of

document design in the public domain in Australia. Sless (2004) mentions that public

documents need to be practically accomplishable and socially desirable. Drawing upon

his experience at the Communication Research Institute of Australia, Sless (2004)

identifies attributes that encourage and sustain reading; specifically, Sless (2004)

mentions that documents should be credible, respectful of users, attractive, physically

appropriate, socially appropriate, easy to use, efficient, and productive. Departing

from usability testing of documents, Sless (2004) introduces a method he calls

"diagnostic testing," involving one-on-one deep conversations on a reader's use of

documents.

Additionally, researchers in business and professional communication have

examined the implications of cultural difference on the design of such document types

as business memos, contracts, business letters, research instruments, marketing letters,

advertisements, instruction guides, and surveys (Brislin, 1980, 1986; Han & Shavitt,

1994; Bell, Dillon, & Harald, 1995; Sauer, 1996; Graves, 1997; Tebeaux, 1999; Harris

& Attour, 2000; Jansen & Balijon, 2002; Krosnick & Fabrigar, 1997; Stevens, 2000).

These studies, altogether, form a basis for designing documents for use in different

cultures. Because cross-cultural research is not directly related to QuikScan, I do not

provide deeper analysis.

This body of research in information design, as a whole, provided both

practical lessons on design as well as theoretical insights. However, many attempts to

improve the reading of document lie in the parts of the field of reading research that

examine how people read and search for information and the reading assistances (e.g.,

signals) that may facilitate reading. In the next section, I discuss relevant literature in

reading and reading signals.

2.2   Reading and Reading Signals

There is an abundance of literature on reading. This body of research addresses

a wide variety of topics including, but not limited to, the psychology of reading,

reading comprehension, retention, information seeking, and signals that assist reading.

Much research in this area largely focuses on educational psychology and is primarily

concerned with how people read to learn. To a certain degree, this body of research on

reading and reading signals has some overlaps with that on information design, for

reading researchers and information designers share similar interests in regard to how

people interact with texts, graphics, and documents overall. In this section, I focus on

the literature that is most pertinent to QuikScan. First, I introduce the research on

reading and information. Then, I focus on a number of concrete reading signals, some

of which are components of QuikScan, and discuss their effectiveness.

2.2.1 Reading and Information Seeking

Researchers have explored the cognitive processes of reading. For example, Jonassen (1985) points out that when readers read a document, the content goes into their working memory and retrieves their long-term memory. Because the capacity of the readers' working memory is highly limited (as I have demonstrate in my discussion on the information design literature), various information sources compete with one another (Jonassen, 1985). Readers, therefore, usually have to take a selective approach and allocate their attention in different ways for different types of information (Jonassen, 1985). Gibson and Levin (1976) define reading as "extracting information from text" (p. 5). Reading involves multiple complicated cognitive processes, such as abstracting relations, ignoring irrelevant information, and distinguishing superordinate and subordinate information (Gibson & Levin, 1976). To facilitate such a selective extraction, hierarchical organization and clear structure can help (Jonassen, 1985). Headings, summaries, typographical enhancements and other signals can help visualize this hierarchical organization (Jonassen, 1985; Lorch & Lorch, 1995, 1996a, 1996b; Nevid & Lampmann, 2003).

Studies have examined the effects of a reader's existing schemata on reading (Spyridakis, 1989a; Rouet, 2006). During reading comprehension, readers extract relevant information and assimilate them with prior knowledge (Gibson & Levin, 1976). Hermosa (2002) introduced two types of reading processing: assimilation and accommodation. Assimilation is a process by which new information is added into a reader's existing schemata. Accommodation, however, occurs when new concepts

challenge and change existing schemata.

To put these abstract cognitive processes into concrete form, researchers have identified specific factors that affect reading, including text characteristics and reader characteristics (Hermosa, 2002). Text characteristics such as sentence structure, sentence relations, text organizations, and content difficulty are influential on reading comprehension and retention (Gibson & Levin, 1976; Spyridakis, 1989a; Hermosa, 2002).

Among the reader characteristics, readers' familiarity and reading purposes are frequently examined. Researchers such as Spyridakis (1989a) and Lorch and Lorch (1996a) consider familiarity in studying the use of headings. Whether a reader is familiar with a text largely determines how fast they read, how well they comprehend, and how they use headings, summaries, and other document features (also known as signals, as I shall explain later in this chapter) (Spyridakis, 1989a; Lorch & Lorch, 1996a, 1996b; Nevid & Lampmann, 2003). Regarding reading purposes, numerous studies have examined reading comprehension and retention. These studies typically relate these reading purposes with text characteristics and reader characteristics. Jonassen (1985) points out that readers make the most extensive use of superordinate information during comprehension. The gist (general idea) of a passage tends to be recalled more than other details by the readers (Jonassen, 1985). Spyridakis (1989b) found that the processing of superordinate information (top level information specifically stated) and superordinate inferential information (top level information integrated and generalized by readers) are different and each of them suits different

types of signals. Researchers have shown the relationship among retention, text

difficulty and readers' familiarity with the text (Spyridakis, 1989a, 1989b; Lorch &

Lorch, 1996b; Schultz & Spyridakis, 2004). Spyridakis (1989b) found that readers

benefit most from signals on medium-difficult passages, but not on low-difficulty or

high-difficulty passages.

A prominent advantage QuikScan has to offer is facilitating information

seeking; thus the body of research in information seeking provides an important

ground for my research. Information seeking, as defined by Case (2002) in his

landmark book *Looking for Information: A Survey of Research on Information*

Seeking, Needs, and Behavior, is "a conscious effort to acquire information in

response to a need or gap in your knowledge" (p. 5). In particular, Case (2002)

believes that information seeking usually happens under time pressure:

> It [information seeking] is a behavior so commonplace that it is
> generally not an object of concern until time pressure makes it so. If we
> are making a major decision (e.g., buying a house) or finishing a task
> by a deadline (e.g., writing a report), we might find ourselves in an
> earnest information seeking mode: talking to others, searching the Web,
> reading magazines, watching the news, and so on. We may do
> everything we can to satisfy our desire for input, until either our need is
> satisfied or we have run out of time. More commonly, it is the latter, as
> the demand for "information" is usually elastic—there is always more
> than one could know. After our need is met (or we give up) we return
> to a more passive state of information seeking, at least as regards the
> object of our earlier curiosity. (Case, 2002, p. 5)

According to Case (2002), the research on information seeking dates back to

the beginning of the 20th century. Today, information seeking is largely viewed as

"sense-making" (Case, 2002).

> In the sense-making characterization, a search for information starts with questions directed at making sense of the situation; communication is central to the process of "bridging the gap" to reach some kind of information or help desired. The strategies employed are shaped by the searcher's conceptualization of both the gap and the bridge, and by the answers, ideas, and resources obtained along the way (Case, 2002, p. 70-71).

Researchers point out that information seeking, as a problem-solving and purposive activity, intends to satisfy a goal, to discover patterns, to fill gaps, and to detect relationships among stimuli (Garner, 1962; Wilson, 1999a; Case, 2002). When people search for information, they browse and sometimes scan a document (Case, 2002). Two concepts, relevance and salience, are related to such browsing and scanning (Case, 2002). According to Case (2002), people search for information that is relevant in topicality and context. Such relevance is key for attracting readers' selective attention to certain information (Lachman, Lachman, & Butterfield, 1979; Case, 2002). In addition to being relevant, information that attracts readers' attention tends to be salient and outstanding (Case, 2002):

> [B]efore one begins to consider the characteristics of an information source and its usefulness, an interaction occurs between a gap in knowledge, beliefs about that topic of knowledge, and the import or "standoutedness" of it. We pay attention and render action to those things that are salient to use. (Case, 2002, p. 92)

The need to read selectively is more paramount when readers encounter information overload (Case, 2002). They are naturally inclined to filter information and focus more on those that are more salient and important (Miller, Galanter, & Pribram, 1960; Case, 2002).

Information seeking has been largely studied by researchers who are interested

in the broad concept of information behavior, which entails social and cultural aspects.

Many information seeking models, such as that of Wilson (1981, 1999a), Leckie,

Pettigrew and Sylvain (1996), and Johnson (1997), largely focus on the needs of

information seekers, their beliefs and attitudes, interpersonal context, and

environmental factors. These models, while helpful, aren't directly associated with

QuikScan because the approach I took to examine the effect of QuikScan on

information seeking didn't focus on contextual issues. Therefore, these models aren't

elaborated in this chapter. Case (2002) points out that the theories that information

seeking draws upon are broad and multidisciplinary, including psychology, sociology,

mass communication, management, consumer research, and so forth. He introduces

five theoretical paradigms relevant to information seeking: principle of least effort,

uses and gratifications, sense-making, media use as social action, and play theory.

However, most of these paradigms are concerned with how people seek information in

a broad sense, that is, how people buy goods, use media, or complete a task, which is

remote from document use. I selectively focus, instead, on the principle of least effort

since it is the most informative to my research on QuikScan. The principle of least

effort, the work of philologist Geroge Zipf (1949), is said to be frequently used as a

paradigm for information seeking research (Case, 2002).

> According to Zipf (1949), each individual will adopt a course of action
> that will involve the expenditure of the probable least average of his
> work—in other words, the least effort. (Case, 2002, p. 140)

Speaking about the principle of least effort, Case (2002) points out that

"humans tend to use short, common words whenever they can (leading to highly

frequent usage of just a few words) rather than longer words that take more effort" (p.

141).

> In the practical realm, the human tendency toward economy of effort is
> often exploited by systems designers. Indexers of documents, whether
> working by instinct or with term rankings, may establish cutoff points
> to determine which words are indexed and which are not.
> …………………………………………………………………………
> [S]ome office managers arrange files by frequency of use so that the
> most frequently used files are at the front of each drawer, rather than
> filing them alphabetically or in some subject arrangement. (Case, 2002,
> p. 142)

To a certain extent, the QuikScanner is like these office managers; she arranges

the most superordinate ideas into Boxed Summaries to make sure that readers spend as

little effort as possible finding these ideas. An approach related to the principle of least

effort is the cost-benefit paradigm (Case, 2002). The cost-benefit paradigm asserts that

information seekers assess tradeoffs and make decisions on whether it is worth to

pursue an information seeking task given the amount of efforts needed (Hardy, 1982;

Case, 2002). QuikScan gives information seekers confidence that they can effectively

use documents with a low cost but high benefits.

Researchers have identified the different cognitive processes for reading

comprehension and information seeking (Guthrie & Kirsch, 1987). Reading

comprehension depends on the readers' background knowledge, text structure, and the

ability to make inferences (Guthrie & Kirsch, 1987). Information seeking, by contrast,

is influenced by how readers cognitively "identify specific information, such as

propositions, phrases, or numbers, within a large amount of writing, such as passages

of prose, a table, or a combination of both" (Guthrie & Kirsch, 1987, p. 220).

Dreher (1992) defines search as an attempt to "locate information for specific purposes." (p. 364) Mosenthal (1996) generated a list of factors that influence how readers seek information. This includes document complexity (simple, complicated), the type of information requested (concrete, abstract), the type of match (locating, integrating), and the plausibility of distracters (Mosenthal, 1996). Brown (2003) believes that locating particular information is a goal-related, strategic, and selective process in which the readers usually skim or scan. Brown (2003) found that both text characteristics and reader characteristics affect readers' searching performance. In other words, text characteristics and reader characteristics influence both reading comprehension (explained earlier) and information seeking. In my empirical studies (Chapter 4), I considered such text characteristics as the topic of the text and the difficulty of the content; I also considered reader characteristics such as their familiarity with the experimental text.

In this section, I have reviewed the relevant literature on reading and information seeking. This body of literature provides a conceptual basis for understanding reading as a cognitive process, understanding the factors that affect reading performances, and understanding the differences between reading comprehension and information seeking.

After setting the general context of reading and information seeking, I devote the next section examining the literature on a number of major reading signals such as headings, summaries, and number signaling. In the middle of this discussion, importantly, I also show empirical research that examines the effects of these signals.

These empirical studies have largely informed the empirical research in my dissertation.

2.2.2 Reading Signals

Researchers in educational psychology and technical communication have examined a wide variety of ways, usually called signals (Spyridakis, 1989a, 1989b, Lorch & Lorch, 1995, 1996a, 1996b) or structural cues (Spyridakis, 1989a), to facilitate the comprehension, retention, and information seeking in documents. These reading signals include but are not limited to headings, summaries, previews, topic sentences, text titles, number signaling, typographical cues, advance organizers, and logical connectives. Because the term "signals" is used by a majority of researchers, it is used consistently in this chapter.

Signals have been studied in the context of reading comprehension and retention, and more recently information seeking mostly by scholars in educational psychology. An early work that introduced the study of signals to the field of technical communication, particularly to document design, is by Spyridakis (1989a, 1989b) in her two-part series on signaling effects published on the *Journal of Technical Writing and Communication*. Spyridakis (1989a) points out that signals "attempt to pre-announce or emphasize content and/or reveal content relationships" (p. 227).

> Signals are frequently categorized by their function. Previews (frequently complete sentences) announce superordinate content and relationships among superordinate content before the reader encounter them. Heading, which occur as short phrases, also announce superordinate content before the reader encounters the actual content. Logical connectives, somewhat like transitions, interrelate superordinate and subordinate content by adding in words and phrases

that emphasize the relationships, e.g., *however*, *moreover*, and on *the other hand*. Signals should help the reader form a hierarchical framework in memory that will facilitate the placement of incoming information. (Spyridakis, 1989, p. 228)

In studying signals, researchers have associated the effects of signals with documents of different lengths and readers of different attributes (e.g., background, reading level, familiarity with the subject of the document) (Spyridakis, 1989a). They have used a variety of methodologies such as immediate and delayed recall, problem-solving, short answer tests, forced choice tests, and so forth (Spyridakis, 1989a). In reviewing the relevant literature in this body of research, I choose to categorize it by the types of signals and demonstrate the studies (mostly empirical) on their effects. This decision was made to effectively present literature in accordance with the nature of QuikScan—a creative and systematic combination of signals. For the rest of this section, I discuss the literature on headings, summaries, and number signaling.

Headings

Headings have been extensively studied in many aspects, including heading frequency (Spyridakis, 1989a), the phrasing of headings (Hartley, Kenely, Owen, & Trueman, 1980; Hartley, Morris, & Trueman, 1980; Hartley & Trueman, 1983), and the mix of headings with other signals (Spyridakis, 1987). Most studies examine the effects of headings on reading comprehension, retention, and recall. Since reading is a selective process, headings facilitate "access to the text" (Jonassen, 1985). Specifically, headings "signal the structure of the program," "provide pointers for accessing specific pages," and "confirm that access has been made to appropriate pages" (Jonassen, 1985, p. 255-256). Headings can help readers rapidly locate information in

a document (Jonassen, 1985).

Spyridakis and Standal (1987) examine the singular and mixed use of headings, previews, and logical connectives on expository passages of different levels of difficulty, different lengths, different structures, and different depths of information. To measure comprehension, they used a multiple-choice test, with half of the questions asking for content details and the other half asking for superordinate or inference-making information. To determine different levels of content superordination (depth of information), Spyridakis and Standal (1987) constructed a hierarchical outline of the passage's content. They found that headings (and previews and logical connectives) enhance comprehension in general, but they particularly noted that the effects of headings were more prominent when the passage was lengthy, relatively difficult, and unfamiliar to readers. Length, difficulty, and the reader's familiarity toward the document are three important factors that shape readers' performance (Spyridakis, 1989a). In addition, the longest passage used Spyridakis and Standal (1987) in their study contained fewer than 1000 words; they suggest that significantly longer passages need to be examined to further explore the effects of signals.

Spyridakis and Standal (1987) confirm the effectiveness of multiple-choice tests:

> It appears that qualitative questioning elicits the effects of signals in a way that counting detail units alone in recall situations may not. This is true whether one uses a problem-solving test or multiple-choice questions that demand inferencing as the qualitative measure. (p. 293)

In her 1989 study, Spyridakis further investigated the effects of headings,

previews, and logical connectives on reading comprehension and retention. She points

out that some researchers found inconsistent results regarding the effects of headings

and points out that this is likely due to the fact that short passages were used. Instead,

she used passages that exceeded 1000 words. She examines four aspects of

comprehension—superordinate content, inferential superordinate relationships,

subordinate content, and inferential subordinate relationships—and uses an equal

number of questions to investigate comprehension. In addition, Spyridakis (1989b)

examines the immediate and delayed effects of signals on comprehension (the same

set of tests were used in both immediate and delayed comprehension). In her study,

she uses the analogy of "road signs" to describe the function of headings.

> People frequently pass a road sign without consciously registering it,
> yet weeks later they may know where some street is located because of
> the sign they had seen earlier. In other words, headings were minimally
> expected to help readers to remember content when called upon after a
> period of time. (p. 410)

Spyridakis (1989b) found that "signals do improve a reader's comprehension,

particularly comprehension two weeks after the reading of a passage and

comprehension of superordinate and superordinate inferential information" (p. 395).

Headings aided retention in particular; they were found most effective when used on

lengthy texts and used without logical connectives (Spyridakis, 1989b):

> Headings appear to have helped the subjects build a strong hierarchical
> framework in memory from which they could infer superordinate
> relationships. (Spyridakis, 1989b, p. 408)

Additionally, Spyridakis (1989b) assumes that previews have similar effects as

headings:

> It is logical to assume that previews and headings were both functioning to reveal superordinate content before readers encountered the actual content; hence, they helped readers to construct hierarchical frameworks in memory. (p. 409)

Lorch and Lorch (1995, 1996a, 1996b) examine the effects of organizational signals, among which headings are the main focus. In a 1996 study, Lorch and Lorch examine the effects of heading on text recall and summarization. They found that headings facilitate text recall because they signal major transition points and clearly lay out the organization of a document (Lorch & Lorch, 1996b). Specifically, headings aided the recall of unfamiliar content items, but not familiar ones (Lorch & Lorch, 1996b). Lorch and Lorch (1996b) also confirm findings in the existing literature indicating that signals may not always benefit the amount of recall but the distribution of recall. They also found that such variables as how a passage is organized, how complex the passage is, how much the passage discusses a topic all complicate the effects of organizational signals like headings. Notably, Lorch and Lorch's study (1996b) examines the immediate and free recall of content (the participants wrote down what they remembered), while the empirical studies in this dissertation examine the retention a week after the participants have read the documents.

Headings have also been found to facilitate information search in text (Yussen, Stright, & Payne, 1993; Klusewitz & Lorch, 2000). Kulsewitz and Lorch (2000) investigate the effects of headings and familiarity with a text on how people search for information in a text. They point out that headings aid information search in three

ways:

> First, headings demarcate distinct content in the text (i.e., section information), so they can be used to guide the process of sampling information on a page chosen for inspection. Second, headings provide a topic label that provides a searcher with information about the likely content of a text section (i.e., content information). Thus, headings can be used to make a decision about whether to examine a text section at all. Finally, the use of multiple-level headings provides information about the hierarchical relations among topics in a text (i.e., organization information). This information might be used to more rapidly locate the part of the text (e.g., first or second half of the text) that is likely to contain the target information. (p. 668)

Kulsewitz and Lorch (2000) use different types of headings, some revealing sections, content, and organization information (structure headings), some revealing section and content information (topic headings), and some revealing only the sections of the text. They found that participants performed faster in locating information when the headings didn't just simply reveal the sections of the text, but also the topics and the hierarchical structure of the text. They also found that familiarity plays a vital role in information search. They manipulated participants' familiarity with the text by "the number of prior searches of the text" and "whether or not the text was read before searching" (p. 667).

> If the text is unfamiliar, searchers must begin with the first page and inspect each successive page until they locate the target information. In contrast, searchers who are familiar with the text can consult their topic structure representations and estimate the page on which the target information is likely to be located. If they fail to find the target information on the first page they turn to, they can compare the topic(s) on that page to their topic structure representations in order to compute their next page turn. (p. 668)

QuikScan summaries usually appear immediately after a heading. They contain

a much deeper level of detail that isn't usually communicated by headings. Since

headings that signal the topics and hierarchical structure of the text are the most

helpful (Kulsewitz & Lorch, 2000), QuikScan summaries are likely to benefit readers,

for these summaries contain superordinate content and clearly show topic structure

through the numbers in the summaries and the target numbers in the main body of

text.

Summaries

Signals typically associated with the study of headings are summaries,

previews, or overviews. These terms, summaries, previews, and overviews, mean

different things for different researchers. Therefore, I put them in the same category.

Overviews, previews, and summaries both resemble and differ from headings

(Lorch & Lorch, 1995). As Lorch and Lorch (1995) put out:

> Like topical overviews and summaries, headings explicitly label
> important text topics; unlike overviews and summaries, headings
> communicate information about the organization of topics only
> implicitly by their position in the text. (p. 538)

Lorch and Lorch (1986) found that readers who read text with summaries were able to

remember the content better. In their 1995 study, Lorch and Lorch focused on how

headings, summaries, and overviews facilitate the free recall of information and how

these signals differ from one another. In their study, the summaries and overviews

used in the experiments were of the same content except that the overviews appeared

immediately before the text and the summaries appeared immediately after the text

and they were labeled "overviews" and "summaries" respectively. Lorch and Lorch

(1995) inserted each overview immediately before the expanse of text it led. Each

overview begins with an underlined phrase designating it as the overview for that

corresponding section:

> The first paragraph was inserted immediately before the section of the
> text discussing environmental damage. It began with an underlined
> phrase designating it as an overview of the first section, and it
> identified and numbered the six problems to be discussed in their order
> of discussion. The second paragraph was inserted immediately before
> the section of the text discussing alternative energy sources. It began
> with an underlined phrase designating it as an overview of the second
> section, and it identified and numbered the six alternatives in their
> order of discussion. (Lorch & Lorch, 1995, p. 540)

Lorch and Lorch's (1995) use of overviews largely resembles the Boxed Summaries in

QuikScan because these Boxed Summaries appear immediately before the

summarized local section and the numbered list items match the same numbers in the

main body of text.

Lorch and Lorch (1995) found that headings, overviews, and summaries

"induced readers to change their text-processing strategy from one in which they do no

systematically encode the text's structure to one in which they do [strategy-switch

hypothesis]" (p. 543). They also found that the signals showed significant effects

when readers were cued in their recall (given a list of topics they have read).

In addition to Lorch and Lorch (1995), numerous researchers have found that

summaries facilitate reading comprehension and recall (Bean, Singer, Frazee, & Sorter,

1983; King, Biggs, & Lipsky, 1984; Singer, 1986; Singer & Donlan, 1989; Nevid &

Lampmann, 2003). When signals like summaries or overviews are present, readers

tend to pay attention to the top-level structure of the text (Meyer, Brandt, & Bluth,

1980; Meyer & Rice, 1982, 1989; Loman & Mayer, 1983; Mayer, Dyck, & Cook,

1984). Murray and McGlone (1997) suggest that readers spent less time on topic

sentences if these superordinate content items are signaled through overviews. Singer

and Donland (1989) found that an effective summary can filter out unessential

information and synthesize the superordinate content. Otterbacher, Radev, and Luo

(2002) studied automatically generated summaries and human-generated summaries

and pointed out that summaries written by editors are more cohesive and informative.

QuikScan summaries are human-generated to ensure they effectively communicate

superordinate information. With multiple within-document summaries, QuikScan

gives overviews to specific parts of a document, providing much more convenience

for information seeking.

Nevid and Lampmann (2003) investigate the use of highlighting and signaling

key concepts in students' content acquisition of textbooks. They point out:

> Textbooks have long highlighted key terms to help students acquire the
> technical vocabulary needed to develop an understanding of the subject
> matter. Similarly, students should be able to encode and retain
> important concepts more easily when textbooks signal or highlight
> them. (p. 228)

Specifically, Nevid and Lampmann (2003) studied the effects of signaling key

concepts as inserted summaries in the margin of textbook passages. They conducted a

study in which 80 undergraduate students read two textbook chapters (one signaled

with marginal inserts and one unsignaled) and answered multiple-choice questions to

demonstrate their content acquisition. The textbook chapters they used contained

headings, subheadings, and boldfaced terms, and thus fit with the standard expository

model. Regarding the multiple-choice quiz, half of the items were about signaled

content and the other half was about the unsignaled content (Nevid & Lampmann,

2003). At the end of the study, each participant indicated their preferences between the

signaled and unsignaled texts. Nevid and Lampmann (2003) found the following

interesting results:

> The results of this study indicate that signaling may facilitate encoding
> and retention of key concepts. Students performed better on content
> quizzes overall and on the subset of items assessing key concepts when
> this material was signaled than when it was not. (p. 229)

Associating their findings with teaching, Nevid and Lampmann (2003) point out:

> By signaling key concepts, authors can alert students to the major
> concepts contained in signaling to help students identify key lecture
> points. For example, they can prepare lists of the main points or
> concepts they cover in their lectures and present this information in the
> form of blackboard notes, handouts, or overhead transparencies. (p.
> 229)

Intriguingly, Nevid and Lampmann (2003) also found that students did not

perform better on those test items that were related to the unsignaled content. They

believe that "[s]tudents should not use the highlighted concepts or other pedagogical

features, such as summaries or study quizzes, as substitutes for a complete reading of

the assigned text material" (p. 229). Nevid and Lampmann (2003) inform my research

in the following ways. First, I considered their methodology and study procedure in

my empirical research on QuikScan. In assessing the effects of QuikScan on reading

comprehension and retention, I used a multiple-choice questionnaire that asked both

the information signaled by QuikScan and those not signaled by QuikScan. In

assessing the effects of QuikScan on information seeking, I further divided

multiple-choice questionnaire into three types of questions whose answered were

signaled to different degrees. Second, Nevid and Lampmann's findings suggest that

QuikScan may be an effective tool in spotlighting superordinate information and may

be used as a pedagogical device.

Number signaling

One signaling device that can improve comprehension and recall is number

signaling (Lorch, 1985; Lorch & Chen, 1986). As Lorch and Chen (1986) explain:

> [I]f a text presents an argument for a particular point of view, each
> piece of supporting evidence might be preceded by numbers or by
> number words (e.g., first, next, and finally). (p. 263)

Lorch and Chen (1986) examine the effects of number signaling on recall

through a study in which participants read two texts and performed free and question

recall (providing recall questions) afterwards. Lorch and Chen (1986) used two texts

of similar structure and produced a version with number signaling for each one. They

identified 10 target sentences (superordinate content) in each text and used a number

to indicate the serial position of each of the target sentences. Lorch and Chen (1986)

found that number signals have the following influence on text recall: "guiding

readers' attention to the signaled text information," "influencing how the information

is represented in memory," and "directing the process of recall itself" (p. 268).

In addition, Lorch and Chen (1986) found that readers spent more time

processing sentences that were preceded by a number signal. They believe that the

difference between the time spent on unsignaled and signaled sentences indicate that

"number signals direct how subjects allocate their attention during reading" (p. 268).

> In sum, number signals appeared to affect the process of recalling
> information from memory by protecting signaled information from

being deleted from free recall as irrelevant or unimportant. (Lorch & Chen, p. 268)

However, it is important to note that Lorch and Chen (1986) did not use number signals in association with summaries, and did not highlight the number signals in their experimental passages. Using numbers in QuikScan summaries was an important design decision. The numbers are aimed to make each Boxed Summary function as a "map," pinpointing to the places in the body text.

So far, I have discussed three types of reading signals: headings, summaries, and number signaling. In the middle of this discussion, I described both the studies that used individual signals and those that employed multiple signals simultaneously. Because QuikScan is a format that integrates different reading signals, it is important to learn the lessons in mixing signals in addition to those I have discussed. Jonassen (1985) points out that inappropriately combining various types of typographical cues such as color, boxes, typefaces, and size, may have an undesirable effect. Applying too many cues on a document or implementing cues on a large percentage of a document both hinder readers' comprehension (Jonassen, 1985). Avoiding the excessive use of QuikScan is important in ensuring that the presence of QuikScan brings more help than distraction. In Chapters 3 and 7, I describe design considerations and guidelines that prevent an excessive use of QuikScan.

The literature on reading and reading signals supports my research in the following ways. First, the theories on reading and information seeking provide a basic but important foundation upon which I conceived QuikScan. Second, the literature on

signals informs the effectiveness of a number of major signals such as headings, summaries, and number signaling. Some of these are incorporated into QuikScan as a component; others resemble QuikScan in certain ways. This literature shows when these signals can be most effective, thus guides my way of designing and implementing QuikScan. Third, the literature on signals largely informs the empirical tradition and experimental methods that have been used to examine the effects of signals on reading comprehension, retention, and information seeking. All in all, the body of research on reading and reading signals is informative on several fronts. More broadly speaking, the literature on information design and reading and reading signals, when combined, provides the primary foundation for my research.

My search for literature, however, also led me to a smaller, but more specific body of literature on summaries. Although summaries are studied by reading researchers, the literature on summaries exists beyond the realm of reading. It spreads across several disciplines, notably technical writing and organizational communication. Because the Boxed Summary is a primary component of QuikScan, it is necessary to explore how summaries are viewed and studied by the researchers in these disciplines. I devote the next section to the literature on summaries.

2.3   Summaries

The quality of the QuikScan summaries determines its appropriateness and effectiveness. In the field of technical and professional communication, there has been an enormous amount of research on how to write effectively for different genres and in different situations. Studies tend to explore the process of technical writing, the use

of language, and the production of typical technical documents such as proposals,

instructions, and presentations (Alley, 1996; Markel, 2006). Some researchers focused

on writing and communicating in such professions as the computer industry,

environment, health, government, the military, and so forth. Although all of them are

very helpful to QuikScan, it is the study of summaries that most closely pertain to

QuikScan. Grant-Russell and Beaudet (2001) reviewed a large body of research on

summaries:

> Summaries and the summarizing process have been used and studied
> for a wide variety of purposes: by educators as a tool for evaluating
> language skills; by teachers as a method of improving their students'
> abilities to process information and write coherently; by reading
> specialists and psycholinguists interested in memory, reading and
> comprehension; by linguists interested in discourse processing
> strategies, semantic and rhetorical structure, and intertextual relations;
> by information specialists in the field of library science; and, most
> recently, by computer scientists interested in artificial intelligence and
> automatic information retrieval systems. The summary has been taught,
> studied, written about and researched from such a variety of approaches
> and across so many disciplines that it is truly an interdisciplinary topic.
> (p. 105)

In the preceding section, I have explained empirical studies on summaries

within the context of reading research. In this section, I focus on the research on

summaries that has given anecdotal, qualitative, and empirical support for QuikScan.

2.3.1 Purposes and Effectiveness of Summaries

The purpose of the executive summary is to inform readers as to the purpose,

scope, methods, findings, and conclusions of a document (Alred, Brusaw, & Oliu,

2006). Green (1993), in the context of proposal writing, believes that the executive

summary is critical for a proposal in persuading decision makers. Hill (1993)

considers the effective summary as a "sales document" whose purpose is to "give an overview of the proposal and to present, arrange, and phrase the facts in a way that will persuade the reader to reach the conclusion that the bidder should get the job" (p. 166). Emanuel (1996) points out that the executive summary should be used to help business decision makers who usually don't have time to read a lengthy document. Many summaries take multiple pages yet do not enable readers to efficiently process such a large amount of information (Emanuel, 1996). In Emanuel's format of executive summaries, information is presented in the sequence of problem definition, summary of factual information, conclusions, recommendations and cost-benefit analysis. The summary contains page numbers where the ideas presented briefly in the summary are discussed in full. This is a bit like QuikScan. In each section, a statement is provided to connect it with previous sections causally. Emanuel's format combines the feature of an executive summary with the function of a Table of Contents.

Hartley (1999) analyzes the advantages of structure abstracts. These abstracts, containing sub-headings (e.g., introduction, methods, results), are found to inform readers more and enable them to search and read (Hartley, 1999). In formatting summaries, Hartley (1994) also found that enlarging the type size of an abstract can improve the clarity of the content.

2.3.2 Writing Effective Summaries

Much research and commentary on summaries deal with how to write effective summaries. Anderson and Hidi (1989) identify two key factors that influence summarizing: selection and reduction process. Specifically, the summary writer

should understand what to include and what to eliminate, as well as what to emphasize and what to condense (Johnson, 1983; Anderson & Hidi, 1989). Anderson and Hidi (1989) believe that the characteristics of the text, the presence of the text during summarization (as opposed to recall), and the purpose of summarizing shape the writer's selection and reduction process. For instance, summarizing a document for oneself (writer-based summary) largely differs from summarizing for someone else (reader-based summary) (Anderson & Hidi, 1989).

Much research has been done on the executive summary. Unlike normal summaries that appear before the original document, the executive summary is a slightly different genre and can typically be read separately from the original document. Seeing the executive summary as a "persuasive marketing document that reflects the major points of the overall proposal," (Chuck, 1994, p. 512), Chuck explains the purpose of the summary, its length and content, and makes insightful recommendations on producing an effective executive summary. "[T]he summary should be a document that nudges the team to merge proposal strategies and details into a clear and cohesive story." (Chuck, 1994, p. 512) Chuck (1994) points out that the executive summary should focus on the key discriminators and features of a proposal, maintain flexibility in length, and should compliment rather than substitute for the original proposal.

Hill (1993) has a special approach to summaries. He suggests that an executive summary should consist of a synopsis, a short review of topic sentences, and a synthesis of both. The synopsis should "feature boldfaced headings, indentions, bullets

to enhance the main arguments, interesting illustrations, and sufficient white space to give the page an uncrowded look." (p. 169) The main body of the synopsis should provide page numbers or section numbers so that readers can conveniently find corresponding content items (Hill, 1993). The executive summary should end with an inviting wrap up that entice readers to understand the benefits of a proposal (Hill, 1993). Hill (1993) also stressed the importance of having senior management review the executive summary. Because Hill's analysis focused on proposals, the executive summary typically occupies a number of pages and is aimed at attracting customers (Hill, 1993).

Focusing on scientific writing, Alley (1996) humorously describes summaries as a means to "give away the show right from the beginning and let the audiences decide whether they want to read the document" (p. 21). Alley considered two types of summaries: descriptive and informative. Descriptive summaries predict what information is included in a document whereas informative summaries (or executive summaries) are themselves synthesized version of the document (Alley, 1996). "Everything written in the informative summary—every sentence and illustration—is either a repetition or condensation of something in the main text of the document." (p. 25) Writers do not write either an executive or an informative summaries; rather they may need to combine the two (Alley, 1996). To keep the summary short, a descriptive presentation may be used within an informative summary to describe a lengthy list of items and to save space (Alley, 1996).

In the context of discussing strategies for effective scientific writing, Alley

(1996) suggests several ways to emphasize details. Although his discussion was not centered on summary writing, the concept of emphasizing details is very relevant to QuikScan. Alley (1996) points out that because people typically only remember a portion of a document, important phrases should be repeatedly expressed. Writers should mention important details not only in the main body of text but also in informative summaries and conclusions (Alley, 1996). A second way to emphasize details is through the use of dependent clauses and infinitive phrases (Alley, 1996). A third way to spotlight details is by using illustrations, although they should not be overly used (Alley, 1996). The fourth way of emphasizing details lies in the strategic placement (Alley, 1996). According to Alley, "text that borders white space receives more emphasis than text that borders other text. For this reason, the titles and headings receive emphasis because they are surrounded by white space (line breaks before and after)" (p. 66). Alley (1996) makes the reasonable suggestion that when there is a rather long list of items, it may diminish the relative importance of particular items. Producing a shorter list or breaking the original list into a hierarchical structure could solve this problem (Alley, 1996).

2.3.3 Teaching and Learning through Summaries

Some researchers have approached the summary from the perspective of using summaries as a tool for learning. Bean (1986) points out during summarizing, students develop dialectic thinking. "In summarizing another person's ideas, the student must temporarily abandon his or her own perspective to assume what is often an unfamiliar point of view." (Bean, 1986, p. 344)   "With systematic guidance from the teacher,

summary writing can encourage movement from thesis (the student's initial, unchallenged ideas) to antithesis (the summary of a dissonant view) to synthesis (more complex and developed ideas)." (p. 344) Since many students may find it hard to accept alternative perspective other than their own (Egocentrism), summary writing could improve their dialectic thinking (Bean, 1986). Further, summary writing helps reading comprehension, organizing information, and presenting contradictory opinions (Bean, 1986).

There is another more specialized thread of research on automatic summarization. Such research is typically focused on automated summarization, computer-assisted abstracting, algorithms, and other information retrieval. Since QuikScan involves human work, the literature in automatic summarization is not reviewed. In the future, however, it should be possible to develop machine-assisted QuikScan, which would make QuikScan much more convenient to use.

2.4   Summary of the Conceptual Framework of QuikScan

In this chapter, I have demonstrated the three broad realms of knowledge that comprise the conceptual framework of QuikScan: information design, reading and reading signals, and summaries. I used the term "information design" as an umbrella term for the literature on (1) book design, (2) document and information design theories, principles, and techniques, (3) document usability, and (4) relevant literature on the organizational and cultural aspect of information design. This thread of literature helps me conceptualize QuikScan in the historical context of the evolution of document formats and provided both theoretical and pragmatic assistance for the

design of QuikScan and the empirical studies. The literature on reading and reading signals is immense. This thread of literature gives strong theoretical support to the claim that QuikScan is likely to improve reading comprehension, retention, and facilitate information seeking. It gives direct support, mostly empirical, on the effectiveness of such signals as headings, summaries, and number signaling. Meanwhile, this body of literature leaves certain gaps. For example, as Klusewitz and Lorch (2000) point out, there hasn't been much research on the effects of signals on information seeking and there hasn't been enough research that examines how people seek information on a document they have read before. These gaps are filled in my empirical studies. A third thread of literature I focused on is on summaries. This realm of knowledge is dispersed and somewhat buried in different disciplines. I consider the literature on summaries as an independent thread that builds the conceptual foundation of QuikScan. It guides the design of QuikScan components and in particular, the implementation of QuikScan (which is addressed in Chapter 7).

It is important to note that although these three threads inform the design and use of QuikScan, the field of rhetoric and particularly the research on author-reader relationships provides a lens to analyze the rhetorical context of QuikScan and the roles played by the QuikScanner and the reader of QuikScanned documents. In Chapter 5, I present this body of literature on rhetoric as I analyze the rhetorical implications of QuikScan.

In the next chapter, I present the design of QuikScan that is largely informed by the three threads of literature I have discussed.

Chapter 3: The Design of QuikScan

Throughout the literature review, I have provided an abundance of lessons on improving documents and assisting reading. I have also identified lacunas that prompted me to devise new design ideas. In this chapter, I introduce the design of QuikScan for use in print and online documents in light of these insights drawn from the literature.

The design of QuikScan has had a long gestation. Over several years of design and research, several pilot tests were conducted involving students and working professionals. These tests have helped me refine my design ideas. As first explained in Chapter 1, QuikScan is best suited to conventionally formatted documents that adhere to the standard expository model. In addition to the simplest design described in Chapter 1, I have successfully created a variety of designs that fit with diverse document genres and optimized these design components for various contexts of document use. While my early work focused on print media, I have also attempted to produce a robust and dynamic version for the interactive online environment. QuikScan is intended to be simple, parsimonious, and intuitive.

In this chapter, I first introduce the primary components of QuikScan: summaries and highlighting. Through examples and scenarios, I explain the placement of these summaries in documents, the way the summaries are formatted, and the functions of highlighting. I then discuss the extended design components: adapting summaries for different contexts of document use and different types of documents.

Finally, I show design solutions for using QuikScan on Web pages. The design draws upon a variety of theories such as the Gestalt theory, the principles of information design, and the effectiveness of different reading signals. QuikScan modifies and integrates a number of information design techniques and attempts to make the best use of them.

Before delving deep into the chapter, however, I first briefly explain two primary types of QuikScanning activity, defined by their purposes. These two types of QuikScanning must be introduced prior to the detailed description of the design because they largely determine how QuikScan should be used. As represented in Figure 3.1, sometimes a QuikScanner is more closely aligned with the community that originates the document, which I call *Originator-Aligned QuikScan.* Sometimes she may be more closely aligned with the community that receives and uses the document, which I call *Audience-Aligned QuikScan*. While both QuikScanning activities are influenced by the audience, such audience influences are more paramount and specific in the latter. Therefore, the difference between these two types of activities can lead to some significant differences in QuikScanning style. These two activities are explained in related sections later in the chapter.
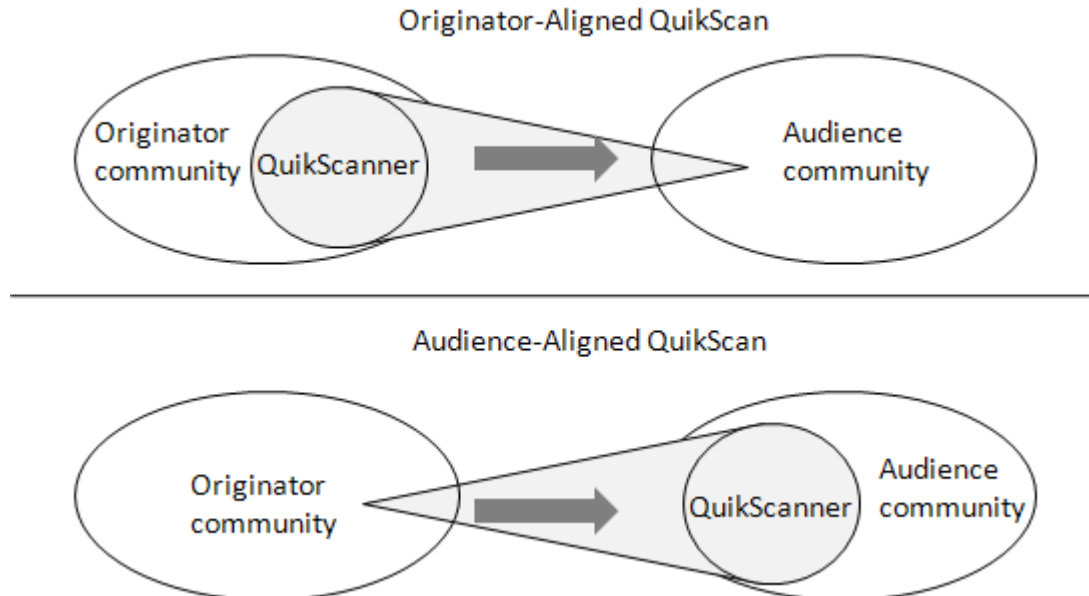
Figure 3.1 Originator-Aligned QuikScan and Audience-Aligned QuikScan

3.1 Primary Design: Summaries and Highlighting

QuikScan consists of two components: summaries and highlighting. The most prominent component of QuikScan is the Boxed Summary. Boxed Summaries appear throughout a document, typically after a heading. They summarize each local section. A Boxed Summary is typically formatted as numbered or lettered list items. Each number or letter in the summary text corresponds to the same number or letter in the main body of text where the summarized item is elaborated in full.

Each summary is put in a box in order for it to be easily differentiated from the body text. According to Gestalt theory, such a use of boxes helps differentiate information (Moore & Fitz, 1993). In addition, the summaries have a light turquoise background color. The use of color distinguishes the figure from the ground, achieving a satisfactory figure-ground segregation (Moore & Fitz, 1993). Light turquoise was chosen because it stands out clearly against a white background when a document is

printed in color or viewed on a monitor and because it appears as a legible gray when a document is printed in black and white.

Boxed Summaries differ from the commonly used executive summaries or abstracts in two major ways: First, Boxed Summaries summarize the superordinate ideas of each section locally rather than synthesizing the whole document globally. Second, the numbered (or sometimes lettered) list items in the summaries are keyed to their corresponding locations in the main body of text, enabling readers to conveniently locate specific information.

Depending on document genre, the placement of headings and the frequency of headings vary. To accommodate these differences, I have devised three types of Boxed Summaries: Standard Summaries, Floating Summaries, and Compound Summaries. In this section, I first introduce these three types of summaries and note when they should be used. I then explain the numbering and lettering system in Boxed Summaries. Finally, I demonstrate the function of the second component of QuikScan—highlighting.

3.1.1 Standard Summaries

The Standard Summary, shown in Figure 3.2, is the most prevalent kind of Boxed Summary. Standard Summaries appear directly after a heading and summarize the entire section of the document (up until the next heading or the next summary). Standard Summaries are very useful for documents that are structured by headings and subheadings. Specifically, they are most suitable for documents that employ a low to medium frequency of headings. Figure 3.3 represents two Standard Summaries

appearing in a document of this kind.

Economic Feasibility of Supplying Red Cedar to Manufacturers

6} The government funds extraction.
7} The costs to landowners are almost entirely transportation.
8} These transportation costs should typically be $9.25/ton.
9} But the plan only works if red cedar is a suitable raw material for particleboard.

{6 Currently landowners can make use of state and federal programs that fully subsidize the cost of extracting or otherwise removing red cedar from their property. {7 Therefore, the cost to landowners of supplying red cedar to manufacturers consists almost entirely of transportations costs. {8 Transportation costs will vary for each landowner depending upon the vehicle load, distance to the manufacturer, and the costs of gasoline. Our

Figure 3.2 A Standard Summary consisting of four list items
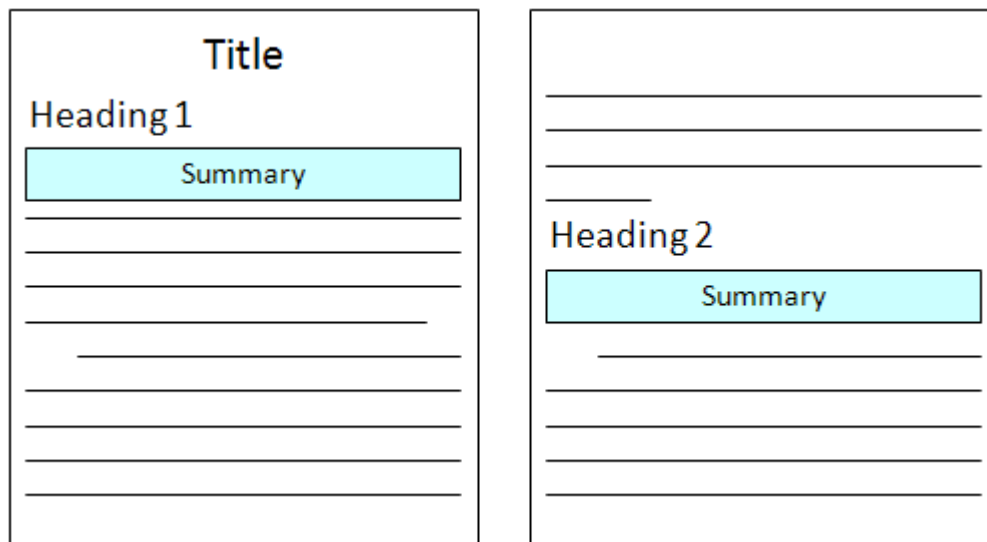
Figure 3.3 Standard Summaries in a document

3.1.2 Floating Summaries

As we know, not all documents are structured by headings. Among those that

do, the frequency of headings varies. The use of headings and their frequency depend

on document genre, medium, subject area, and the formatting preferences of the

individual writer. For example, an instruction manual typically employs a high

frequency of headings whereas a journal article in the field of English tends to have

fewer headings. Documents with few headings are likely to have longer sections governed by each heading. In these documents, Floating Summaries should be used. The Floating Summary, shown in Figure 3.4, "floats" in the midst of a long expanse of text; it does not directly follow any heading. If the QuikScanner perceives a shift or some other juncture within this expanse of text where a summary would be appropriate, she uses a Floating Summary. It is possible to employ multiple Floating Summaries within a very long section of a document; each Floating Summary will summarize an expanse of text within that section.

Following the first criterion, four product categories stood out between 1985 and 2002 as belonging to the 40 most dynamic product groups: electronic and electrical goods; chemicals; engines and parts; and textiles and clothing. Following the second benchmark, a number of agricultural and processed foods and beverage items cropped up in the "top 40" (United Nations Conference on Trade and Development, 2004).

11} Despite the dynamic growth of manufacturing exports from developing countries, developed countries enjoy much more of total export value of products involving high research and development.
12} However, some East Asian economies have made significant inroads as suppliers of higher-skill, higher-tech products to world markets.
13} Most developing countries are involved in the low-skill assembly phases of production, which may cause the price of exports to decline.
14} There is an on-going debate on whether liberalization and open trade necessarily benefit growth.
15} Several investigations argued that outward-oriented economies grow faster.
16} However, a growing number of criticism questions this relationship between outwardness and growth speed.
17} Hence, the more specific association between trade liberalization and growth remains largely unproved. This relationship also depends on the pattern of trade specialization of a country.

11} Despite the dynamic growth of manufacturing exports from developing countries, developed countries generally accounted for the lion's share of the total export value of products requiring high research and development (R&D) expenditures and characterized by high technological complexity (SITC section 5 and division 87), the exception being optical instruments. 12} It was only a limited number of East Asian economies—for example, Malaysia, the Republic of Korea, Singapore and Taiwan Province of China—that made significant inroads as suppliers of higher-skill, higher-tech products to world markets.

13} Most developing countries are thus involved in the low-skill assembly phases of production. Because they have often increased their participation in the labour-intensive segments of production of high-tech goods, the question which arises is whether being engaged in the low-skill assembly stages of the production chain carries the same benefits as the export of more high-skill, high-tech products or whether, to the contrary, a form of "commoditization" is occurring.

Figure 3.4 A Floating Summary consisting of seven list items

3.1.3 Compound Summaries

Some documents contain multiple short sections divided by headings and subheadings. Due to the high frequency of headings, these sections are too short for Standard Summaries to be employed effectively because summarizing the limited

amount of content in a short section might only require a single list item. Also, the summary might largely repeat the relatively brief amount of text comprising the section, thus reducing the meaningfulness of the summary. Floating Summaries, similarly, are not appropriate for short expanse of text.

When encountering these short sections, the QuikScanner should use Compound Summaries. As shown in Figure 3.5, Compound Summaries appear directly before the first of the cluster of short sections. All the headings in the expanse of text summarized by the Compound Summary are replicated within the summary. In general, one or more list items appear below each of the headings within the summary, but if the heading is sufficient to summarize the section, the list items can be omitted. To differentiate items in a Compound Summary and to signal that these summarized items are treated as one whole section, a two-part numbering system is used. The value of the first number (the number that precedes the hyphen) represents the count of Boxed Summaries up to that point in the document. In Figure 3.5, this is the fifth Boxed Summary in the document, thus the first number is 5. The second number (following the hyphen) represents headings and subheadings within the section. Note that the headings rather than the list items are numbered. This is to make it easy for readers to grasp the structure of the summarized section and conveniently locate details. The overall numbering system in QuikScan is explained in detail in the next section.

5-1} **TC Builds a Global Village**
As part of the rapid globalization of technical communication, TC works with, and designs for, citizens of the world. Here is a sampler of our extensive international programs.

5-2} **International research programs**
TC faculty, graduate students, and undergraduates have engaged in numerous international research projects. Strong ongoing ties often result.

5-3} **Visiting professors and scholars**
Visiting professors and scholars from all over the world guest lecture, teach complete courses, collaborate with us on research projects. TC faculty are themselves frequent guest researchers and instructors.

5-4} **International student exchanges**
We have an active student exchange with the Department of Communication Studies at the highly regarded University of Twente in the Netherlands. We seek more such opportunities.

5-5} **The Technical Japanese Program**
TC's unique Technical Japanese Program enriches the international experience of our students and opens doors to internships and other opportunities in Asia.

{5-1 TC Builds a Global Village
The second revolution in technical communication is the globalization of the profession. We now work with, and design for, citizens of the world. To ensure that TC students can work effectively in the international environment, TC has launched an extensive international program. Here is a sampler of our activities.

{5-2 International research projects
Especially in recent years, TC faculty, graduate students, and undergraduates have engaged in numerous research projects in Central Asia, Africa, Europe, Japan, and elsewhere. In many cases, strong permanent ties with our international partners have emerged from these projects.

{5-3 Visiting professors and scholars
TC has hosted visiting professors and scholars from all over the world, and these

Figure 3.5 A Compound Summary

3.1.4 Numbering and Lettering

As noted, most QuikScan summaries contain list items using either numbers or

letters. Each of these numbers or letters corresponds to the same numbers or letters in

the main body of text where the summarized item is elaborated in full. To

accommodate different types of documents, several numbering and lettering formats have been devised.

Numbering and Target Numbers

The use of numbered list items and corresponding target numbers enables readers to easily find specific information that appears in the QuikScan summaries. In addition, the target numbers provide a unique "address" for the key content of the document. For example, someone might say, "Carmen, please look at target number 11." Or, "Carmen, please look at target number 5-3."

QuikScan employs two different schemes for numbering list items and their target numbers. For relatively short documents, it is often best to use a single sequence of numbers running consecutively (start to finish) throughout the entire document. This scheme is shown in Figure 3.2. Notice that the numbers of the list items are boldfaced and followed by a right brace and that the target numbers are boldfaced, highlighted with a turquoise background, and preceded by a left brace. The reason to use turquoise but not light turquoise is that these numbers are optimized for locating information and so they need to stand out. Since highlighting (yellow), explained later in the chapter, is used for subordinate details in the main body of text, the color for target numbers ought to be more salient than the highlighted subordinate items.

Previously I have introduced the use of two-part numbering in Compound Summaries (Figure 3.5). This numbering format is also desirable for longer documents in general. As shown in Figure 3.6, the value of the first number (the number that precedes the hyphen) represents the count of Boxed Summaries up to that point in the

document. In other words, if this is the ninth Boxed Summary in the document, the value of the first number is 9. The second number (following the hyphen) re-starts with each summary, making it clear how many superordinate ideas are summarized. This approach prevents the second number from becoming inconveniently large in a lengthy document. Notably, if a Compound Summary and its and two-part numbering is used in a document, it doesn't mean that other Boxed Summaries in the same document have to use the two-part numbering system. For example, the summary that follows the Compound Summary in Figure 3.6 starts with the number "10." If it's another Compound Summary, its numbers are likely to be "10-1," "10-2," etc. If it's a Standard or Floating Summary, its numbers could be "10," "11," "12," etc. In other words, inserting a Compound Summary in a document does not disrupt the numbering.

Moreover, China and India were not the only countries driving these increases. When these two countries are excluded, the share of manufactures increased from 10 to more than 60 per cent of total exports of low-income developing countries in the period from 1980 to 2003.

9-1} There have been significant regional differences in the increase of manufacturing exports.
9-2} East Asian economies enjoyed the highest position, Latin America and the Caribbean were intermediate, and Africa was lowest.
9-3} Least developed countries and small island developing countries still depend on primary non-fuel commodities for over half their export earnings.
9-4} The reasons why not all developing countries have benefited from the trade boom are excessive dependence on one or two primary products, civil conflict, politically motivated trade embargoes.

9-1} While the share of manufactures rose in most geographical regions, there have been significant regional differences. 9-2} In the East Asian economies, almost 70 per cent of goods exports were manufactures in 2001 and over 80 per cent in 2003. Moreover, the relevant exports were often at the higher end of the value-added chain and many were

Figure 3.6 Two-part numbering in a Floating Summary

Lettering and Target Letters

Some standard expository documents use a system of numbered headings and subheadings. For example, the heading of the passage in Figure 3.7 is numbered "3.4.1." In such documents, the addition of a set of QuikScan numbers would cause confusion. Therefore, list items are preceded by an alphabetical sequence of letters, starting fresh at "a" for each new summary (Figure 3.7). Likewise, corresponding target letters rather than numbers are employed.

3.4.1 Economic Feasibility of Supplying Red Cedar to Manufacturers

a} The government funds extraction.
b} The costs to landowners are almost entirely transportation.
c} These transportation costs should typically be $9.25/ton.
d} But the plan only works if red cedar is a suitable raw material for particleboard.

{a Currently landowners can make use of state and federal programs that fully subsidize the cost of extracting or otherwise removing red cedar from their property. {b Therefore, the cost to landowners of supplying red cedar to manufacturers consists almost entirely of transportations costs. {c Transportation costs will vary for each landowner depending upon the vehicle load, distance to the manufacturer, and the costs of gasoline. Our

Figure 3.7 The use of letters in a document that employs a system of numbered headings

Directionality

In both summaries and the main body of text, braces are used next to the numbers and letters preceding the list items as well as the target numbers and letters. The main reason for using braces is to suggest directionality (the direction the reader's eyes should be looking) and to facilitate reading. The use of braces (which are akin to arrowheads in shape) is supported by the literature on the use of arrows. Researchers believe that arrows can be used to depict the direction of actions (Tversky et al., 2000; Krull & Sharp, 2006). Krull and Sharp (2006) consider arrows as "visual verbs" that facilitate the processing of procedural information. Tversky et al. (2000) point out that

without arrows, only structure and interrelation can be identified but not direction.

Braces used in QuikScan function as arrows.

Initially, I used braces of the same direction (right braces) for both summary items and target numbers and letters. By using right braces, I intend to signal there is more content coming. After a number of pilot tests, however, participants recommended that the direction of the braces used in the two different places should be differentiated. It is more intuitive to have the braces in the Boxed Summaries right-pointing and those in the main body of text left-pointing to suggest the correspondence between the two.

The issue of directionality became more important when I tested QuikScan on a blind student who read QuikScanned documents on a computer with the help of text-to-speech software. Text-to-speech software reads out loud every word and punctuation mark in a document. Because a blind reader cannot see the Boxed Summaries, he or she relies on audio cues provided by the software. Therefore, differentiating the directionality between the braces in the Boxed Summaries and those in the main body of text is very important: Text-to-speech software tells a blind reader whether it's a left brace or a right brace. A blind reader can therefore easily differentiate whether he or she is listening to summaries or the main body of text[2]. This is an example of how the evolution of QuikScan has been driven by user testing.

3.1.5 Highlighting
A premise underlying QuikScan is that the main job of the QuikScanner is to

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[2] Chapter 6 explains in-depth the use of QuikScan by visually impaired readers.

summarize the ideas that the author has made superordinate. Assuming a reasonable match between the author's intended audience and the actual audience reading the QuikScanned document, what the author considers most important should be close to what the audience cares about the most. It is common, however, that the QuikScanner identifies ideas that are less superordinate and decides to leave them out of the summaries in order to maintain conciseness in summaries. There will also be times when the QuikScanner identifies items of subordinate information that are nonetheless important for target readers whose goals differs from the those of the original author's anticipated audience. Highlighting can be used to spotlight both less superordinate information and subordinate but important content items.

A yellow highlight is used for highlighting because it is neither too bright nor too dark when printed on paper in black and white (Figure 3.8). It is a lighter background compared to the turquoise color used to highlight the target numbers and letters in the main body of text. I believe less superordinate and subordinate details ought not to compete with the target numbers and letters, for the numbers and letters are optimized for locating superordinate information. Differentiating the use of color also makes a document legible when they are viewed on the computer screen. In this section, I explain two kinds of highlighting: highlighting less superordinate items and highlighting subordinate items.

Highlighting Less Superordinate Items
Sometimes, QuikScanners leave out less superordinate ideas (considered somewhat important by the original author) in order to make summaries as concise as

possible. But these less superordinate items are valuable elaborating upon the

summarized items, and they cannot simply be considered subordinate or unimportant.

For example, the passage in Figure 3.8 explains the commitment to diversity in the

Department of Technical Communication at the University of Washington.

Highlighting appears in three places. The first two explain the diversity scholarship.

The third highlighted item is contact information. All three items are secondary rather

than superordinate information, but they are worth highlighting because they provide

useful information about the summarized items.

1} UWTC developed a diversity mission statement to convey TC's effort to have a diverse community and devised a "roadmap" to set milestones.
2} After a meeting with students and alumni, the UWTC Diversity Board was formed.
3} The first diversity scholarship was awarded to two students in Autumn 2007.
4} The TC department is fostering a supportive environment for students, faculty, and staff.

{1 UWTC believes in diversity, but how do they show it? The TC department's desire for a diversity program coincided with former TC adviser Jesse Knappenberger's Master's internship in 2005. Collaborating with Judy Ramey, UWTC Chair, the two developed a diversity mission statement and a "roadmap" to help direct UWTC's diversity efforts. The goal was two-fold: to develop a statement that would convey how the TC department strives to have a diverse community, and to set milestones in the roadmap to keep progress moving forward.

{2 Knowing the importance of drawing on the wisdom of our alumni from diverse backgrounds, Knappenberger invited TC students and alumni to a meeting in summer 2006. Knappenberger and Ramey were pleased to find that more than a dozen students and alumni were dedicated and interested in helping the department meet the goals in the roadmap. This group was dubbed the UWTC Diversity Board.

{3 Moving forward, the UWTC Diversity Board has advised the department on the selection process for the first Sakson Scholarship. Donna Sakson and her husband's gift of $100,000 launched UWTC's first diversity scholarship to be awarded in Autumn 2007 to two students. The purpose of this fund is to bring more under-represented minority students into the UWTC program and thus into the profession.

{4 The Diversity Board is just a stepping stone to the role that the department wants to play in years to come. By embracing and encouraging diversity, the TC department is fostering a supportive environment for students, faculty, and staff. For more information about the Diversity Board, or for questions regarding the next meeting, please contact Gian Bruno at gbruno@u.washington.edu.

Figure 3.8 Highlighting less superordinate items

Highlighting Subordinate but Important Details

At the beginning of this chapter, I briefly introduced two types of

QuikScanning activities: *Originator-Aligned QuikScan* and *Audience-Aligned*

QuikScan. All my discussion in this chapter so far has been focusing on

Originator-Aligned QuikScan: summarizing superordinate information and

highlighting less superordinate information of the original document without injecting

special needs of the audience. However, any QuikScanning activity is influenced by

the audience; the extent of such an influence varies. *Originator-Aligned QuikScan*, for instance, fully considers the audience but reflects the original author's conception of what is important to the audience. While it is common that the QuikScanner can be more influenced by the originator than by the audience, it is also likely that the QuikScanner is heavily influenced by the audience and is expected to incorporate audience needs in her QuikScanning (*Audience-Aligned QuikScan)*. *Audience-Aligned QuikScan* reflects a more intimate knowledge of the audience than the original author had and, if there are discrepancies in goals and benefits, the QuikScanning is aligned with the interests and goals of the audience. Between the two components of QuikScan, summaries and highlighting, summaries are mostly used to synthesize the superordinate ideas of the original document while highlighting is mainly used for *Audience-Aligned QuikScan* activities. In this section, I illustrate the use of highlighting in audience-aligned situations through two concrete scenarios. In the first scenario, highlighting is almost completely determined by the audience's needs as interpreted by the QuikScanner. The second scenario is more radical in that highlighting reflects the QuikScanner's direct and intimate knowledge of the needs of the audience with which she is aligned (as an employee of the audience community). Therefore, the QuikScanner reveals vital information that might otherwise have been ignored by the audience.

Scenario 1: The University of Washington (UW) Graduate School has released an announcement of twenty scholarships and calls for applications from qualified students. While some of these scholarships are campus-wide, several of them are

targeted at specific academic departments. For example, two scholarships are offered

specifically to those who major in technical communication. The announcement has

been passed to academic advisors of all departments to be sent to their corresponding

students. In the Department of Technical Communication, the academic advisor has

decided to QuikScan this announcement. She uses a Boxed Summary to summarize

the superordinate information in the announcement that is universal to all UW students.

Meanwhile, she feels that it is necessary to emphasize the two scholarships for

technical communication students. Therefore, she tailors the announcement by

highlighting the information about the two scholarships. As shown in Figure 3.9, the

highlighting in this scenario is almost completely driven by the target

audience—technical communication students—and their needs. Since the original

announcement is directed at all students, a QuikScanner in the Graduate School or in a

different academic department would not have focused on the information relevant to

technical communication students. Highlighting effectively enables readers to be

immediately drawn to the content items they consider important.

UNIVERSITY OF WASHINGTON GRADUATE SCHOOL

Announcement of Scholarships for UW Students

> **1}** Donec mi pede, eleifend vitae, ultrices vitae, egestas ut, erat.
> **2}** Ut lacus sapien, pulvinar sit amet, ultrices hendrerit, molestie sed, elit.

Dear students,

        {1 Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Sed tellus leo, porttitor accumsan, iaculis at, congue non, purus. Sed laoreet pretium est. Praesent ut elit. Fusce nunc urna, fermentum et, sagittis sit amet, molestie vitae, nisi. Donec mi pede, eleifend vitae, ultrices vitae, egestas ut, erat.

        {2 Ut ultrices tincidunt lacus. Donec ultricies, ante non vulputate mattis, enim diam lacinia ligula, in fringilla felis ante sit amet justo. Ut lacus sapien, pulvinar sit amet, ultrices hendrerit, molestie sed, elit.

Wayne Scholarship

        Cras felis neque, mattis et, tristique eu, vulputate vitae, ante.

Williams and Mary Scholarship

        Pellentesque id sem. Aliquam cursus, elit in ultrices pellentesque, sapien mauris vehicula mi, a scelerisque ante libero et leo.

....

Innovation in Engineering Scholarship

Vestibulum consequat pharetra enim. Phasellus arcu lectus, lobortis vehicula, congue a, feugiat vitae, massa.

Sakson & Taylor Scholarship

Nullam eu erat id tortor aliquet rhoncus. Suspendisse iaculis tincidunt pede. Ut at urna. Duis lacus. Nunc aliquam ligula vitae lacus. In dui.

Excellence in Communication Design Scholarship

Vivamus nec magna ut augue imperdiet dignissim. Nunc sagittis sagittis lacus. Vivamus vel magna.

National Service Scholarship

Cras risus purus, dapibus nec, dictum a, ullamcorper ut, mauris. Curabitur ultricies malesuada elit. Phasellus eget sapien.

....

Figure 3.9 An example of audience-aligned highlighting

        The value of highlighting may become greater in a business situation when a

single piece of detail may have a significant impact on business operations and profits.

Because readers of such business discourses have limited time to invest on documents,

highlighting can be particularly important in helping them grasp vital information.

Next, I introduce the second scenario in which a member[3] of the QuikScan Directed

Research Group acted as a QuikScanner and obtained first-hand experience on the

importance of highlighting documents in the architecture field.

Researching and writing proposals in the architecture field involves

considerable time and expense. Very often, architects are too busy to invest a

sufficient amount of time researching potential clients. Furthermore, architects may

meet with their upper management only periodically (e.g., once a week or less). It is

critical, therefore, that decisions made in these meetings are thoroughly informed.

QuikScanning documents to be used in these meetings could significantly improve

meeting productiveness.

Scenario 2: The Green Coast Community College (imaginary) in California

has advertised a Request for Qualifications (RFQ) for the construction of the Green

Coast Learning Center. A Seattle-based architecture firm is interested in pursuing the

Green Coast project and has asked one of its employees to QuikScan the RFQ[4]. The

architecture firm has a significant portfolio of work on community college campuses.

They have designed libraries and classroom buildings. They are primarily interested in

whether or not their experience with this project type will allow them to overcome the

challenges they face by being located remotely from Green Coast. For example, is the

---

[3] Kelly Lillis, a member of the QuikScan Directed Research Group, QuikScanned the RFQ and commented on her experience.
[4] The RFQ used in this scenario is based on a real document of an organization but important identifiable information has been removed.

competition from the many equally qualified firms in the Green Coast area too great?

Would the client have an inclination toward hiring a locally based architect instead of

a firm in the Northwest? Is it worth the time and money involved in producing a

proposal, and subsequent interview presentation process? Due to its large size, the

complete QuikScanned version of the RFQ is not included in this chapter. It can be

found in Appendix N. I do, however, describe the most significant aspects of this

scenario.

Initially the QuikScanner struggled with finding the best QuikScan strategies

for this document:

> *These types of documents do not typically have long sections of*
> *expository text that would benefit from summaries or the numbering*
> *technique. They are usually chock full of headings, bulleted lists, bold*
> *text and other signaling techniques, but the critical information still*
> *gets lost easily*. [QuikScanner[5]]

While using some summaries, the QuikScanner considered highlighting to be

the most useful editorial technique. Because a large amount of text is presented in

bullet points, important details do not stand out. During the QuikScanning process, the

QuikScanner found many important details about the expectations of the client, the

expectations that answer some of the questions the architecture firm had. In this

section I show two places where highlighting revealed vital information that was not

of superordinate or even secondary importance in the original document. The first

example, shown in Figure 3.10, belongs to the "Firm Resources" section of the RFQ.

The potential client wants to know the architecture firm's technical capabilities. The

---

[5] Quoted with permission

QuikScanner highlighted "Green Coast Community College District campus" because it hints that the Community College preferred experience on the campus. This information would not have easily caught attention of the staff of the architecture firm without QuikScan. The second example, shown in Figure 3.11, shows the client asking for project team qualifications. Interestingly, as the highlighted parts show, the QuikScanner discovered a potential mistake made by the client. "Child Development Centers" appears in the document but is not mentioned anywhere else; it is possibly copied from a previous RFQ.

The QuikScanner also assessed the broad scope of qualifications the client demanded. These will need to be considered before the architecture firm officially pursues this project. Please note that the QuikScanner originally used a yellow background for the highlighting. For the sake of explaining her point to the research group, she used the "Comment" feature in Microsoft Word, which overwrote the original highlighting.

c. Explain the firm's technical capabilities in the following areas:

6. CAD capability and software proposed to be used to produce the deliverables for the project; and the ability to provide the District with electronic CAD files.

7. Cost estimate history, comparing cost estimates versus actual bid amount on three school projects awarded in last five years.

8. Quality control / assurance procedures, including coordination of design disciplines, complying with program requirements and conformance with Federal/State/Local applicable code requirements.

9. Experience and qualifications on Library Projects, preferably on a Community College campus and/or Green Coast Community College District campus, detailing scope, budget and scale of previous projects.

10. Experience in sustainable design.

11. Experience working with State/Local agencies, including Department of State Architect, City Public Works and Fire Departments.

12. Experience with photovoltaic systems.

13. Financial Information

d. Provide credit references and information regarding the firm(s) financial stability.

Figure 3.10 Highlighting revealing vital information

3. Project Team Qualifications

    a. Identify the following key members within the firm and provide their resumes with qualifications especially as it relates to upper division school projects, and specifically ==Child Development Centers== in a Community College setting:

        1. Project Manager

        2. Lead Architect

        3. Lead Engineer

        4. Lead Estimator

        5. Lead CAD Designer

    b. Identify any proposed ==consultants==, such as ==civil==, ==structural==, ==mechanical==, ==electrical== engineers and any ==other relevant disciplines== for this project. List license numbers and dates as well as business address, phone number and fax number. Include resumes and related experiences for appropriate members of these firms.

4. Firm Resources

    a. Provide a statement demonstrating your firm's or team's ability to accomplish the scope of services in comprehensive and thorough manner with an aggressive schedule in order to meet a client's goal of moving projects into construction within the earliest possible timeframe, in compliance with CEQA.

Figure 3.11 Highlighting revealing vital information

Through these examples, I have shown that QuikScan highlighting can be used in both *Originator-Aligned QuikScan* and *Audience-Aligned QuikScan*. In particular, highlighting can reveal important details that may otherwise be overlooked in a business setting. Chapter 6 addresses the use of QuikScan in business meetings in detail.

3.2   Extended Design: Summary Text

Boxed Summaries are simply the "buckets" of QuikScan; the summary text that makes up the Boxed Summaries is the heart of QuikScan. In this section, I explain the types of summary text according to two dimensions. The first dimension deals

with tuning the informativeness of summary text for different reading goals, reader characteristics, and document genres. The second dimension deals with whether the summary text is keyed to the main body of text or not.

3.2.1 The Informativeness of Summary Text

Summaries are widely used in books, academic journal articles, technical reports, and many other everyday documents. They can be written in different ways. Two major categories of the summary have been studied in technical communication: descriptive summary and informative summary (Alley, 1996). "A descriptive summary (sometimes called a descriptive abstract) tells readers what kind of information the document will contain." (Alley, 1996, p. 23) Descriptive summaries give readers a preview of the document and they can be written ahead of time (Alley, 1996). For example, "the correlation between heat and pressure are presented." This sentence doesn't specify how heat and pressure are correlated, but only predicts the availability of this content. Informative summaries, by contrast, "present the actual results of the work" (Alley, 1996, p. 23). For instance, "this study shows that frequent use of headings improves students' comprehension scores and enhances their satisfaction." In this example, readers understand the know-how. Informative summaries provide more concrete information and are generally preferred.

In QuikScan, although both the descriptive and informative style can be used, Boxed Summaries should primarily be informative because they are usually designed to provide the most complete and concrete information to a reader who may choose not to read the full text.

However, the level of informativeness of the summary text may vary according to three factors: reading goals, reader characteristics, and the nature of the document.

Reading goals: Readers use documents for various purposes. Two major reading purposes are seen common in everyday document use: reading for comprehension and reading to seek/locate information.

When readers read a QuikScanned document primarily for comprehension, they are mostly interested in the informativeness of the summary text. Let's consider the following situation:

> *A QuikScanner is about to QuikScan an introductory material on how to keep Axolotls, a species of salamander that retains its external gills into maturity. The target audience consists of novice readers who have little or no knowledge of Axolotls. The readers would most likely be interested in obtaining a comprehensive picture of this species and how it differs from other species.*

In this situation, because the target audience knows little about the subject matter, the QuikScanner ought to make Boxed Summaries informative. Summaries should not just briefly indicate the specific information to be found in the body of the document; rather, each summary should entail a substantial amount of superordinate content typically written as complete sentences. The QuikScanned document of this scenario is shown in Figure 3.12.

Keeping Axolotls

1} Axolotls are only found in a few Mexican lakes: Lake Xochimilco and Lake Chalco. Due to the development of Mexico City axolotls have become extremely endangered.
2} Axolotls are neotenic and in most ways do not usually develop beyond the larval stage which means they are fully aquatic and do not lose their gills like other salamanders. They will develop sexually while in this stage.
3} Axolotls can regenerate almost any damaged or missing body part. This ability is lost if the Axolotl undergoes metamorphosis.
4} Naturally axolotl colors range from black to brown. Through breeding, a variety of other colors have been brought out: albino white, albino yellow, grey, black, or tan for example.
5} Axolotls are expected to live between 8 and 14 years depending on the conditions.

{1 Axolotls (*Ambystoma mexicanum*) are some of the strangest amphibians to be found anywhere; they are large animals reaching up to 12 inches in length and 5 or 6 inches in girth!

They are in fact Salamanders and are thought to be a branch of the Tiger Salamander which has evolved along different lines probably due to environmental conditions.

Their natural home is somewhat limited to a few lakes in the Bowl of Mexico, Lake Xochimilco and Lake Chalco. Both of these lakes have almost disappeared now due to development of the city of Mexico and drainage but a few small patches and tributaries still remain of Lake Xochimilco. This amphibian is now an endangered species in the wild and has been classified as Cites 1 listed which means they are almost all gone from the wild. Recently there has been some activity to re introduce them to the remaining lake areas that survive; only time will tell if this has been successful.

{2 Axolotls have some quite amazing differences to any other amphibian; the most visibly obvious is that they are almost always seen in their larval stage. Under normal circumstances the Axolotls never *(or rarely)* actually goes through final metamorphosis, this phenomenon is known as *neoteny*. Axolotls are totally aquatic and breathe through external gills which are the frilly organs at each side of the head, they do rarely finally change in to a land living or semi aquatic amphibian which resemble the Tiger

Figure 3.12 A highly informative Boxed Summary

However, there are times when information seeking is paramount. When readers read primarily to search for information, they are more concerned with how well the summary text conveys the nature of the information that can be found in the body of the document. In other words, they want to know where the target information

is located. Let's examine the following scenario:

> *A QuikScanner is about to QuikScan an introductory material on Axolotls. The target audience is a student activist group at the Washington Institute of Technology which plans to put together a letter to a senator about the importance of protecting Axolotls in the United States. The student activists are mostly interested in the fact that Axolotls are endangered and how they differ from other amphibians. They are less interested in, for example, the behavior and appearance of Axolotls, their suitability as pets, and how to care for them.*

Compared to those readers who aim for general knowledge of Axolotls, these students with their specific information-seeking goals prefer concise summaries that signal the location of specific content items in order for them to quickly spot and access the items. The QuikScanner must consider tuning the informativeness of Boxed Summaries for students' information-seeking needs. In this case, this means writing descriptive list items. As shown in Figure 3.13, each summary item is descriptively phrased and is relatively short. When writing summaries this way in general, some list items could be phrases that resemble headings. Compared to complete sentences, phrases require less cognitive resource to process and are easier to distinguish from one another.

Keeping Axolotls

1} Axolotls as an endangered species in the wild
2} How Axolotls differ from other amphibians
3} Why Axolotls regenerate damaged and missing body parts
4} The color of Axolotls
5} Axolotls' life expectance

{1 Axolotls (*Ambystoma mexicanum*) are some of the strangest amphibians to be found anywhere; they are large animals reaching up to 12 inches in length and 5 or 6 inches in girth!

They are in fact Salamanders and are thought to be a branch of the Tiger Salamander which has evolved along different lines probably due to environmental conditions.

Their natural home is somewhat limited to a few lakes in the Bowl of Mexico, Lake Xochimilco and Lake Chalco. Both of these lakes have almost disappeared now due to development of the city of Mexico and drainage but a few small patches and tributaries still remain of Lake Xochimilco. This amphibian is now an endangered species in the wild and has been classified as Cites 1 listed which means they are almost all gone from the wild. Recently there has been some activity to re introduce them to the remaining lake areas that survive; only time will tell if this has been successful.

{2 Axolotls have some quite amazing differences to any other amphibian; the most visibly obvious is that they are almost always seen in their larval stage. Under normal circumstances the Axolotls never *(or rarely)* actually goes through final metamorphosis, this phenomenon is known as *neoteny*. Axolotls are totally aquatic and breathe through

Figure 3.13 A less informative Boxed Summary

In addition to making summary items concise and short, the QuikScanner could consider using more summary items, each of which summarizes a smaller chunk of the upcoming expanse of text. In so doing, each summarized item narrowly matches with the corresponding content item in the main body of text, improving the precision of information seeking.

Reader characteristics: Among many reader characteristics examined in the literature, readers' familiarity with the document subject significantly influences the design of documents such as the use of headings, summaries, and other reading signals.

Therefore, I believe tuning the informativeness of QuikScan summary text partially depends on by how familiar readers are with the topic of a document. Take the following scenario as an example:

> *Reader A and B are both looking for a book on statistics. A is very familiar with statistical concepts, while B has only basic knowledge of statistics.*

Because Reader A is familiar with some statistical concepts, it may not be necessary to provide relatively detailed descriptions of these concepts in the Boxed Summaries. For instance, suppose A is familiar with Analysis of Variance (ANOVA) and Multivariate Analysis of Variance (MANOVA), the QuikScanner may not need to spell out their functions and differences in the summary. As a matter of fact, it may become a burden for A to read information that is redundant. The QuikScanner could phrase the summary item as:

> **1}** ANOVA and MANOVA are explained below.

By contrast, Reader B is less familiar with statistics and may not understand the terminology. Therefore, when describing ANOVA and MANOVA, the QuikScanner does need to spell out what they are and explain how they differ. Otherwise, unexplained terminologies in the summaries could cause confusion. For Reader B, the summary item may be written in the following way:

> **1}** ANOVA (Analysis of Variance) can be used to examine the effects of one or more independent variables on one dependent variable.
>
> **2}** MANOVA (Multivariate Analysis of Variance) is used to examine the effects of one or more independent variables on two or more than two dependent variables.

Nature of the document: The way a document is formatted influences the way summary text should be presented. For example, Figure 3.14 shows a typical bullet point list we see in documents. This bullet point list explains how to write and successfully publish an op-ed (opposite editorial or opinion editorial) article in an American newspaper. There are plenty of bullet points and, on average, they are long:

- Have a "news hook." Make sure the issue about which you write is contemporary and timely without being too far ahead of the news curve.
- At the same time, it doesn't hurt to create an op-ed bank. If you see an angle you want to write on, but an issue is not yet in the news, go ahead and do a draft. When its time comes, do a rewrite to make it timely and send it in. You may get published by being first in.
- Be mindful of the opposing argument. Anticipate plausible or common objections and deal with them respectfully and non-dismissively. Counter-intuitive arguments get attention.
- Although there is a genre of economic or other pieces that can include some numbers and statistics, as a general proposition editors' eyes glaze over "very quickly" when they see numbers. So "sugar-coat that pill" by putting the numbers in a "human context" wherever possible.
- In a similar vein, relating a personal experience lends pieces credibility; omniscience is out. Write in a clear, strong voice. Let the readers see why they should care passionately about this subject and why they should trust what you say.
- Especially with the national newspapers, you should not expect to be published more than twice or even once a year. Local papers seem willing to carry writers more frequently, though often the policy is no more often than once a month. This underscores the need to plan strategically as to where to place which items.
- Depending on the subject you wish to address, a query may suffice, although some editors -- and especially if you are unknown to them -- may want to see a completed manuscript. If possible, you need to pitch the piece roughly two weeks before it will appear (obviously this is impossible with fast breaking stories). The reason is simple: editors need to budget pieces in terms of topics and column inches.
- Try to develop a relationship with the op-ed editor. With any luck, s/he will solicit you to write on topics.

Figure 3.14 A typical bullet point list

Although the goal of using a bullet point list instead of using paragraphs is to improve readability, these long items essentially lose the crispness of bullet points. A

Boxed Summary is used to tune-up the crispness by tersely stating the gist of each of

the somewhat verbose list items (Figure 3.15).

The following bullet point list explains important tips for writing an op-ed opinion piece for newspapers.
1} Pick contemporary and timely topics
2} Prepare topics in advance; submit rapidly when opportunities arise
3} Expect opposing arguments
4} Be cautious when using numbers; put numbers in context
5} Relate to personal experience; write in a strong voice
6} Newspapers limit the publishing frequency of an author
7} Expect query from the editor
8} Develop a relationship with the op-ed editor

{1 Have a "news hook." Make sure the issue about which you write is contemporary and timely without being too far ahead of the news curve.
{2 At the same time, it doesn't hurt to create an op-ed bank. If you see an angle you want to write on, but an issue is not yet in the news, go ahead and do a draft. When its time comes, do a rewrite to make it timely and send it in. You may get published by being first in.
{3 Be mindful of the opposing argument. Anticipate plausible or common objections and deal with them respectfully and non-dismissively. Counter-intuitive arguments get attention.
{4 Although there is a genre of economic or other pieces that can include some numbers and statistics, as a general proposition editors' eyes glaze over "very quickly" when they see numbers. So "sugar-coat that pill" by putting the numbers in a "human context" wherever possible.
{5 In a similar vein, relating a personal experience lends pieces credibility; omniscience is out. Write in a clear, strong voice. Let the readers see why they should care passionately about this subject and why they should trust what you say.
{6 Especially with the national newspapers, you should not expect to be published more than twice or even once a year. Local papers seem willing to carry writers more frequently, though often the policy is no more often than once a month. This underscores the need to plan strategically as to where to place which items.
{7 Depending on the subject you wish to address, a query may suffice, although some editors -- and especially if you are unknown to them -- may want to see a completed manuscript. If possible, you need to pitch the piece roughly two weeks before it will appear (obviously this is impossible with fast breaking stories). The reason is simple: editors need to budget pieces in terms of topics and column inches.
{8 Try to develop a relationship with the op-ed editor. With any luck, s/he will solicit you to write on topics.

Figure 3.15 QuikScanning a bullet point list

When encountering bullet point lists of this kind, the QuikScanner should

summarize the superordinate ideas of each list item and present them in the form of

short sentences. The list items in the summary should be numbered and should appear in the same sequence as they are explained fully in the main body of text. The nature of the document, a bullet point list, prevents the QuikScanner from using elaborated summary items for such items may largely repeat the main body of text.

In short, the informativeness of summary text can be, and should be, adjusted according to reading goals, reader characteristics, and the nature of the document. An informative summary is needed when readers with no particular information seeking goals would like to obtain a comprehensive and in-depth understanding of the superordinate ideas. A less informative summary can be desirable for readers who want to filter out the parts they have no interest in order to search for particular information. It can also be especially useful for those who are subject matter experts on the content of the document.

Sometimes, the QuikScanner may employ summaries of different levels of informativeness in a single document because readers have different needs for different parts of the document. At other times, a document is targeted at more than one audience population; each of the target audiences has a distinctive need. Therefore, the QuikScanner needs to be flexible when crafting summary text.

3.2.2 Keyed Summaries versus Unkeyed Summaries

So far, all the summary types I have being discussing contain either numbered or lettered list items. These numbers and letters do not just itemize the summary text. Rather, each of them is "keyed" to the target number and letter in the main body of text. I call them "Keyed Summaries." The use of Keyed Summaries is the primary

format of QuikScan for they provide accessibility to content items and facilitate information seeking. They can be very useful in most standard expository documents.

Because of the diversity of documents, however, Keyed Summaries may not be feasible or useful in every situation. For example, many standard expository documents employ graphics, tables, charts, and photographs. Sometimes, documents contain bullet point lists whose items are brief. Although these elements are likely to contain essential information, it may not be feasible to "key" the summary to them. Consequently, Unkeyed Summaries should be used to generalize the superordinate ideas of these content items. As its name suggests, an Unkeyed Summary does not contain numbered or lettered list items that correspond to the target numbers or letters in the main body of text. Compared to Keyed Summaries optimized for content accessibility, Unkeyed Summaries do not offer the same amount of assistance in information seeking. Their value lies in the fact that they make it much easier and more efficient for a layperson to decode illustrations that can otherwise be difficult and time-consuming to process[6].

To gain a better understanding of using Unkeyed Summaries to summarize brief bullet point lists, maps, graphs, tables, and other illustrations, it is wise to first analyze how these illustrations are typically used in documents. Generally speaking, there are three ways these illustrations are typically used in documents. First, the authors explain these elements in the main body of text but do not provide any caption

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[6] Unkeyed Summaries can also enable blind readers to attain the content (expressed vocally by text-to-speech software) that they cannot see otherwise. Chapter 6 explains in-depth the use of QuikScan by visually impaired readers.

to each illustration (except brief illustration labels). Second, the authors provide a full caption (usually written as sentences) for each of the illustrations but do not explain them in the main body of text. Third, the authors provide a brief caption to each of the illustrations and explain them in more detail in the main body of text. Fourth, the authors neither explain the illustrations in the main body of text nor provide any caption.

Assuming an illustration contains superordinate information thus must be QuikScanned, the QuikScanner needs to decide (1) whether to use one item in the Boxed Summary for that part of the main body of text to summarize the illustration or (2) to construct a separate Boxed Summary that just summarizes the illustration. The former situation is not that different from other normal summaries. I focus here, instead, on the latter situation. There are a variety of reasons when the QuikScanner may need to use a separate Boxed Summary to summarize an illustration. For example, sometimes the illustration is presented alone, with no explanation in the main body of text and no caption. This is seen more common on the Web. Sometimes, the author has provided a full caption for the illustration; but the caption is rather long and complex. It is necessary to summarize the superordinate ideas of the caption. At other times, the author may explain the illustration in the main body of text and give a caption, but the illustration is too important to simply occupy one item in the Boxed Summary for that part of the main text.

Next, I demonstrate a number of scenarios of using a separate Unkeyed Summary for a brief bullet point list, a map, a graph, and a table when these content

items are neither explained in the main body of text nor addressed through a caption. I choose to focus on this radical situation to show the value of Unkeyed Summaries at its most prominent. Note that if there are textual explanations to the examples shown in this section, the Unkeyed Summaries may be less detailed. Neverthless, these examples are used here to help illustrate the scenarios when Unkeyed Summaries are useful.

Figure 3.16 shows an Unkeyed Summary for a two-column bullet point list of the possible career paths for technical communicators. In this scenario, it is unnecessary to summarize the content by repeating the information in the bullet point list. It is also hard to identify what is superordinate and what isn't. In fact, there may not be superordinate information in this bullet point list and there is no presumed sequence. Therefore, the QuikScanner has to provide an unkeyed descriptive summary statement: *The following is a list of possible career paths for students who major in technical communication.*

The following is a list of possible career paths for students who major in technical communication.

- Technical writer
- Medical writer
- Legal writer
- Proposal writer
- Freelance writer

- Usability specialist
- User researcher
- Information designer
- Web designer
- User interface designer
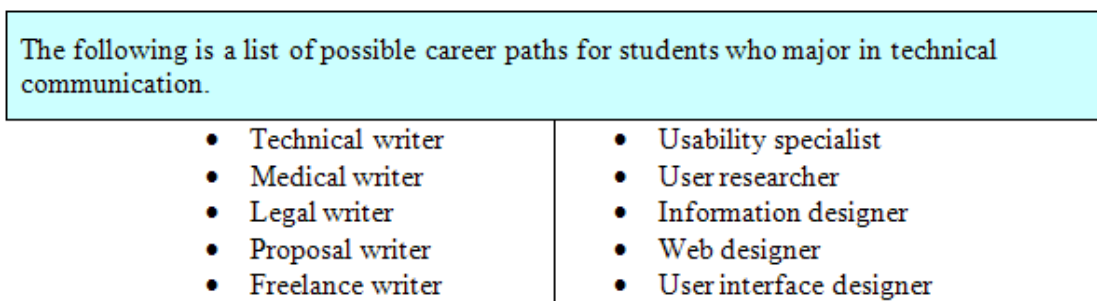
Figure 3.16 QuikScanning a two-column bullet point list

Figure 3.17 shows an Unkeyed Summary for a map previewing the 2006 mid-term election in the United States. Note that unlike the summary in Figure 3.16, which is holistic, this Unkeyed Summary itemizes information. Instead of synthesizing

the gist of the figure in a sentence or paragraph, this summary lists content items in a more readable way.

Whether or not to itemize a summary is a decision an individual QuikScanner makes on a case by case basis. There should be no set rules as of when an Unkeyed Summary must be holistic and when it must be itemized. Usually, it is wise to itemize content items when the summary text is long. Itemizing makes it easy to grasp the major points of the content being summarized.

Figure 3.18 is another example of using an Unkeyed Summary to summarize a figure. This summary is not itemized because it is relatively short and easy to read. Figure 3.19 shows an Unkeyed Summary explaining the differences between Glaucoma and Cataracts in affecting vision loss. While it is impossible to "key" a summary with the two images, the summary text clearly identifies the differences between Glaucoma and Cataracts. Figure 3.20 shows an Unkeyed Summary synthesizing a table. Unkeyed Summaries can be particularly useful when the QuikScanner intends to emphasize certain items in the table.

The following map shows the upcoming 2006 election by states.
► States with orange color will elect a governor.
► States with blue color will elect a senator.
► States with green color will elect a governor and a senator.
► States with yellow color do not elect a governor or senator at this time.

The number in each state represents the number of seats allotted to that state in the House of Representatives.
► The District of Columbia has a nonvoting delegate in the House, but it is not represented in the U.S. Senate.
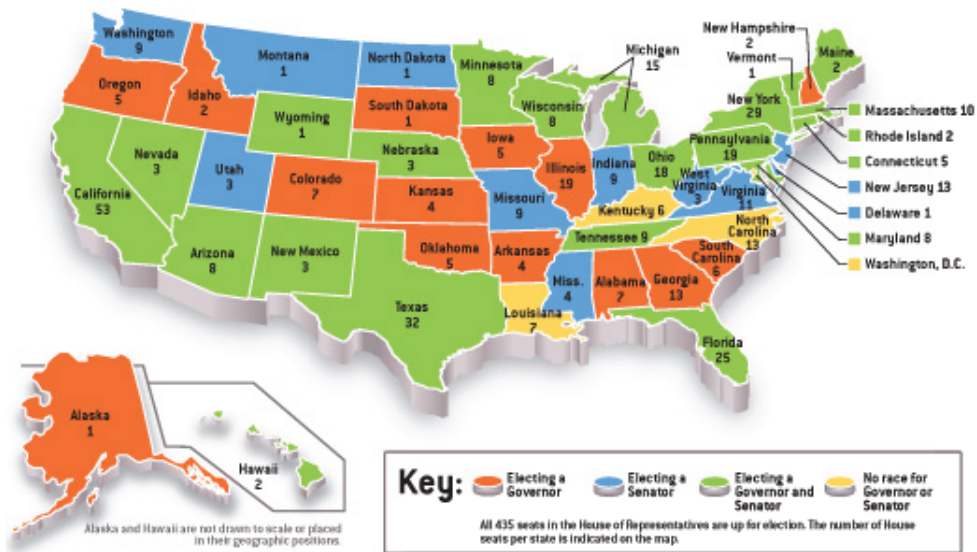
Figure 3.17 An Unkeyed Summary for a map

The following map shows that approximately half a million women died of maternal causes in 2005 according to the World Health Organization. Among the deaths, 99% occurred in developing countries and regions, among which Africa and South Asia are in worst situations. Sub-Saharan region, in particular, takes more than half of the deaths.

Maternal mortality ratio per 100 000 live births

Legend

- Less than 10 deaths per 100000
- 10 - 199 deaths per 100000
- 200 - 499 deaths per 100000
- 500 - 999 deaths per 100000
- greater than or equal to 1000 deaths per 100000
- Data not available
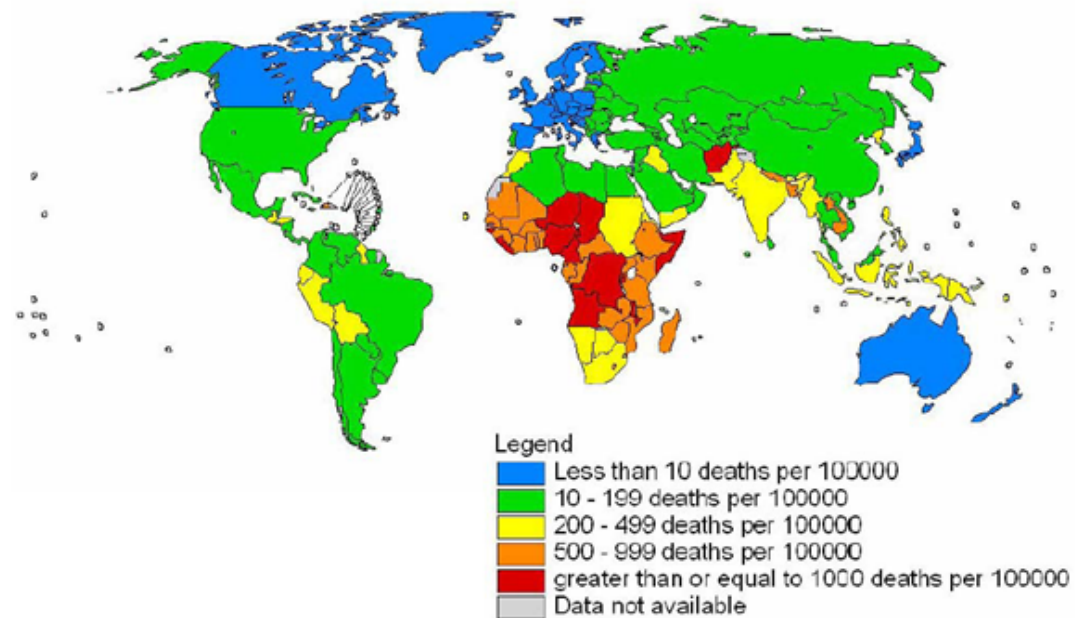
Figure 3.18 An Unkeyed Summary for a map[7]

The following two pictures compare how Glaucoma (left) and Cataracts (right) affect sight. Glaucoma can cause side vision to fade gradually. Cataracts create blurred vision.

Figure 3.19 An Unkeyed Summary for two graphs

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[7] Source: http://www.who.int/research/WHO_maternal_mortality_ratio.pdf (Accessed March 27th, 2008)

Table 1 compares the viral titers for 3 different VHSV genotypes isolated from 6 different sources when plated on 7 different cell lines.

	F1 (Ia)	23-75 (Ia)	KRRV (IVa)	Makah (IVa)	muskellunge (IVb)	mummichog (IVb)
EPC-ATCC	6.5	6.8	5.6	8.6	7.3	7.0
EPC-Newport	6.3	7.0	5.2	8.6	7.5	7.3
FHM-J	6.3	6.9	5.4	8.5	7.4	7.4
FHM-Lamar	6.5	n.d.	5.5	8.7	7.5	7.2
CHSE-214	7.0	5.4	5.1	8.1	5.5	6.2
RTG-2	7.2	n.d.	<3.7	5.1	3.3	3.7
BF-2	7.9	6.7	7.4	8.3	7.4	7.0

Figure 3.20 An Unkeyed Summary for a table

As I have shown, Unkeyed Summaries are valuable in conveying the gist of brief bullet point lists, maps, graphics, and tables. It is important to note that these content items can be QuikScanned using other strategies in addition to Unkeyed Summaries. My intention here is not to limit the QuikScanners' options but rather to show the option of the Unkeyed Summary that may help QuikScanners determine their strategies.

In this section, I have discussed the extended design of QuikScan by focusing on the informativeness of summary text and the use of Keyed and Unkeyed Summaries. QuikScanners should flexibly adopt these strategies and potentially mix them to best fulfill the needs of their target readers.

3.3 Extended Design: Documents with Embedded Previewing Elements[8]

Many authors and editors use a number of strategies to familiarize readers with the goals and structure of documents. I call these strategies "previewing elements" because they provide an overview of the entire document. These previewing elements include but are not limited to preview statements, introductory paragraph(s), and executive summaries. Different strategies are used in different genres of documents. For instance, an academic journal article usually starts with an abstract summarizing its research findings. A book can start with a preface or introductory chapter by the author or editor, explaining the context, content, and recent updates of the edition. These previewing elements are intended to establish the topic of a document, provide prerequisite background information, define terminology, and emphasize important goals.

When encountering a document with such previewing elements, the QuikScanner should not simply repeat them in a summary. Instead, she should provide a higher-level "roadmap" that helps readers decide whether to continue reading. As I shall show, the summaries of these previewing elements should typically be concise and aim for quick scanning.

As a general rule, the QuikScanner should use a Boxed Summary and signal that this is a summary of the previewing elements by using the all caps "INTRODUCTION" heading in the summary (Figure 3.21, 3.22). This is to capture

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[8] Marita Graube, a member of the QuikScan Directed Research Group, contributed importantly to this part of the design.

visual attention and to distinguish this summary from standard Boxed Summaries. In this section, I present my design strategy for summarizing two types of frequently seen previewing elements: statements that preview the structure of a document and statements that outline the goals of the author.

3.3.1 QuikScanning Structure-Outlining Preview Statements

Many documents start chapters, sections, and paragraphs with a preview statement that outlines their structure. Although these structure-outlining statements give a general overview of the document's content, many of them are written and formatted in the same way as the rest of the document. Because they are "buried" in the text, readers may not be able to distinguish these preview statements from other content items. When reading such documents, readers are inclined to intuitively underline, highlight, or take notes on the preview statements. This informal practice on the part of readers suggests the value of visually distinguishing the key points in an overview, and these can be accomplished by QuikScan summaries. Writers may also write relatively lengthy preview statements, but the QuikScan summaries are shorter and easier for readers to process at a glance.

Figure 3.21 shows an example of summarizing a structure-outlining preview statement. This QuikScan summary makes clear the three topics covered in the upcoming expanse of text. Because preview statements or paragraphs are high-level overviews themselves, the QuikScanner does not need to write list items in a sentence form. As shown in Figure 3.21, the summary text resembles headings and they effectively make the structure of the document outstanding.

INTRODUCTION }
Below is the structure of this paper.
1} Theoretical groundwork and the theory of hybridity and cyborgs
2} Empirical research on computer-mediated communication and mobile phone use
3} Literature about mobile phones

{1 This chapter lays out the theoretical groundwork for this project and discusses the primary theory of hybridity as well as the related sub-theory of cyborgs. **{2** Then empirical research on computer-mediated communication and mobile phone use is reviewed in order to illustrate how mobile phone use is both similar to and distinctive from computer-based technologies. These studies of computer use show how people form relationships online and how cultural identity is expressed over computers—concepts that can be extended to the mobile phone arena. The computer-mediated communication literature is also included because computer use is reported in the Tashkent and Bangalore studies. **{3** The literature about mobile phones is then presented to show the theories of mobile technology use that inform this project and to create a theoretical space for discussing the two studies.

Figure 3.21 QuikScanning a structure-outlining preview statement

3.3.2 QuikScanning Goal-Outlining Introductory Elements

It is common for writers to outline their goals and plans for a document in the introductory section. Very often, these goals are expressed as plain text without headings or other signals. Hence, they don't immediately stand out and may often be overlooked. Figure 3.22 is an example of a typical goal-outlining paragraph. The author uses "first, second, third" to lay out his/her purposes. Because these goal statements are relatively short, it may not be necessary to replicate them in a regular Boxed Summary. Instead, the QuikScanner adopts simple use of numbering to make these outlined goals salient for readers.

INTRODUCTION }
Below are the three goals of this report.

{1 First, we seek to demonstrate the weaknesses of the current counterinsurgency operation. **{2** Second, we intend to draw some lessons on tackling the most dangerous challenges in the battle field. **{3** Third, we hope to inform future counterinsurgency operations or related military campaigns for the Marines.

Figure 3.22 QuikScanning a short goal-outlining paragraph

If the goal-outlining paragraph is lengthy, as represented in Figure 3.23, it can be necessary for the QuikScanner to provide list items in the Boxed Summary.
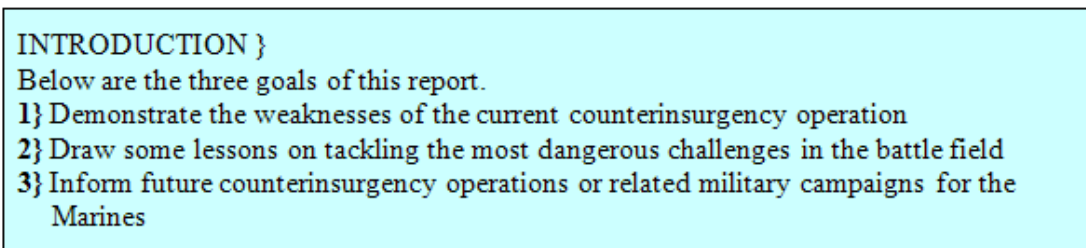
INTRODUCTION }
Below are the three goals of this report.
1} Demonstrate the weaknesses of the current counterinsurgency operation
2} Draw some lessons on tackling the most dangerous challenges in the battle field
3} Inform future counterinsurgency operations or related military campaigns for the Marines

{1 First, we seek to demonstrate the weaknesses of the current counterinsurgency operation. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Nunc vehicula massa eget neque. Curabitur sodales nisi eu lacus. Nullam varius consectetuer ante. Aenean et diam. Cras tristique, lectus ac gravida consectetuer, arcu lectus pharetra eros, sed vestibulum dolor nulla in nisi. Vestibulum gravida interdum dolor. Vivamus aliquet convallis mauris. Quisque iaculis varius ipsum. Donec tortor augue, mattis a, facilisis imperdiet, consequat vel, odio. Aenean lectus lectus, bibendum eget, porttitor a, adipiscing in, massa. Vestibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia Curae; Aenean ut metus. Nulla elementum laoreet odio. {2 Second, we intend to draw some lessons on tackling the most dangerous challenges in the battle field. Nulla adipiscing mi et risus. Integer id elit. Maecenas lorem libero, luctus sed, suscipit sed, posuere nec, metus. Etiam vestibulum dolor. Maecenas leo est, vestibulum ac, dictum sed, varius sit amet, massa. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Nulla felis. Proin in erat vitae elit elementum sollicitudin. Mauris pharetra, augue eu ornare rutrum, velit enim dictum tortor, in rutrum metus erat at sem. {3 Third, we hope to inform future counterinsurgency operations or related military campaigns for the Marines. Donec eget pede vel ante pellentesque suscipit. Cras eu diam. Nullam eget dolor. Maecenas turpis. Pellentesque interdum sapien et risus. Pellentesque mauris risus, porta in, condimentum a, euismod in, augue. Mauris mi. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis vel nibh vel purus dapibus rutrum. Cras feugiat, felis at consequat vulputate, velit tortor porttitor tellus, quis posuere nunc mi a nibh.

Figure 3.23 QuikScanning a lengthy goal-outlining paragraph

3.4   QuikScan on the Internet

My design work on QuikScan has focused primarily on print documents. It was relatively recently that I started to explore ideas for using QuikScan on Web pages. On the one hand, I believe that the basic design principles and strategies of print-based QuikScan should be maintained in the online environment. On the other hand, the interactive and dynamic features of the Web create opportunities for a

dynamic use of QuikScan. In this section, I provide design solutions for using

QuikScan on HTML Web pages. The first solution much resembles its print

counterparts except for the use of hyperlinks. The second solution is used on Web

pages that, departing from the standard expository model, exhibit complex layout.

These design ideas are drawn upon existing research on reading online.

3.4.1 Hyperlinked Summaries

Information design practitioners have been using a variety of strategies to

facilitate online reading. These include but are not limited to hyperlinking, chunking,

tabbing, and so forth. These practices are meant to suit the fast, often impatient

reading habit of online readers. Some practices are particularly close to QuikScan. For

instance, CNN.com editors have been using a bullet point list to outline the major

points of a news story. As shown in Figure 3.24, "story highlights" (circled) enables

users to quickly skim and scan the superordinate content without reading the entire

story.

Figure 3.24 The use of "story highlights" on CNN.com

QuikScan, however, is a more robust and thoroughgoing technique that

supports information seeking as well as scanning superordinate ideas. A direct

application of QuikScan on Web pages is to hyperlink items in the Boxed Summaries

with their target numbers or letters. As shown in Figure 3.25, users can click the item

they are interested in and directly jump to the corresponding section in the main body

of text where the summarized item is explained in full.

Trade in the Developing World

1} The exports of developing countries have grown significantly since the early 1990s.
2} A "new geography" of trade has emerged with developing countries finding new markets for their commodities in other developing countries.
3} Progressive multilateral trade liberalization has supported and contributed to this robust trade.
4} This report examines the relationship between trade and growth. Dependence on primary commodity exports is a "trade vulnerability." Being a small island or landlocked country creates a geographical trade vulnerability.

{1 Since the early 1990s, growth of exports of developing countries as a whole has been robust. In both the first and second halves of the last decade, the average annual growth of developing-country exports surpassed the growth rate of world exports (12.2 versus 8.7 per cent for 1991-1995 and 7.7 versus 4.8 per cent for 1996-2000). Moreover, this trend continues—with global exports having expanded at an annual rate of 5.8 per cent per year in 2001-2003, compared with a comparable rate of 7.4 per cent for developing countries. A number of developing countries have focused explicitly on encouraging exports and have been remarkably successful with their strategies. {2 In some instances, this vigorous trade growth has led to what has been termed a "new geography" of trade, with developing countries finding new markets for their commodities in other developing countries.

{3 Progressive multilateral trade liberalization has supported this robust trade performance. Further multilateral trade liberalization, with a view to generating an equitable outcome to all participants, can contribute to growth and development in developing countries. In fact, the Monterrey Consensus of the International Conference on Financing for Development (United Nations, 2002, annex) acknowledged that "a universal, rule-based, open, non-discriminatory and equitable multilateral trading system, as well as meaningful trade liberalization, can substantially stimulate development worldwide, benefiting countries at all stages of development."

Figure 3.25 An HTML hyperlinked QuikScan summary

Farkas and Farkas (2002), in their book *Principles of Web Design*, address two important concepts of Web navigation: scent and situation awareness. Based upon the information foraging theory, "Scent" refers to how confident users are in finding their target information (Pirolli & Card, 1999; Farkas & Farkas, 2002). When information is poorly organized, readers may not be able to find the right navigation path to their destination (Farkas & Farkas, 2002). Through the use of numbers and concise summary text, QuikScan gives clear directions on what is being discussed on a Web page and how such discussion is structured. Another concept is "situation awareness." As its name suggests, "situation awareness" refers to how much users feel they know

where they are on a Web site (Whitaker, 1998; Farkas & Farkas, 2002). On giant Web

sites, users can easily get lost and give up browsing. QuikScan can be used to enhance

"situation awareness." Because each summary is localized to a particular section of a

body of text, users stay informed on what they have read, what they are reading, and

even what they are about to read.

3.4.2 Pop-up Summaries[9]

Web pages, among others (e.g., magazines, brochures), employ elaborate

formatting that departs greatly from the standard expository model. They are often

complicated by texts, graphics, and animations. It is not possible for a QuikScanner to

alter an existing Web page and freely add boxed summaries with hyperlinked items for

that may substantially change the original Web layout and may require extensive

efforts by the QuikScanner. The QuikScanner, therefore, is likely to be asked to

QuikScan an existing Web page without disrupting its original formatting. Instead of

inserting summaries into the text, the QuikScanner may be able to use Web

technologies to implement pop-up summaries that can be placed almost anywhere on a

web page regardless of the complexity of the formatting.

Figure 3.26 shows the use of a pop-up summary. A red outline is added around

the main heading "Ant" to indicate the existence of the pop-up summary that is hidden.

When the user moves the mouse pointer over the boxed area, the pop-up summary

appears along with number markers indicating the location of the summarized text.

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[9] Niklas Nordlof, a member of the QuikScan Directed Research Group, contributed to this part of the research.

QuikScan, therefore, is not limited to the print medium; rather, QuikScan is quite adaptable to all kinds of online documents. Furthermore, the possibility of pop-up summaries enables QuikScan to accommodate elaborately formatted documents in digital media. QuikScan possesses the potential to be applicable to documents beyond the standard expository model. I give further ideas in Chapter 8 on pursuing this avenue of design work.
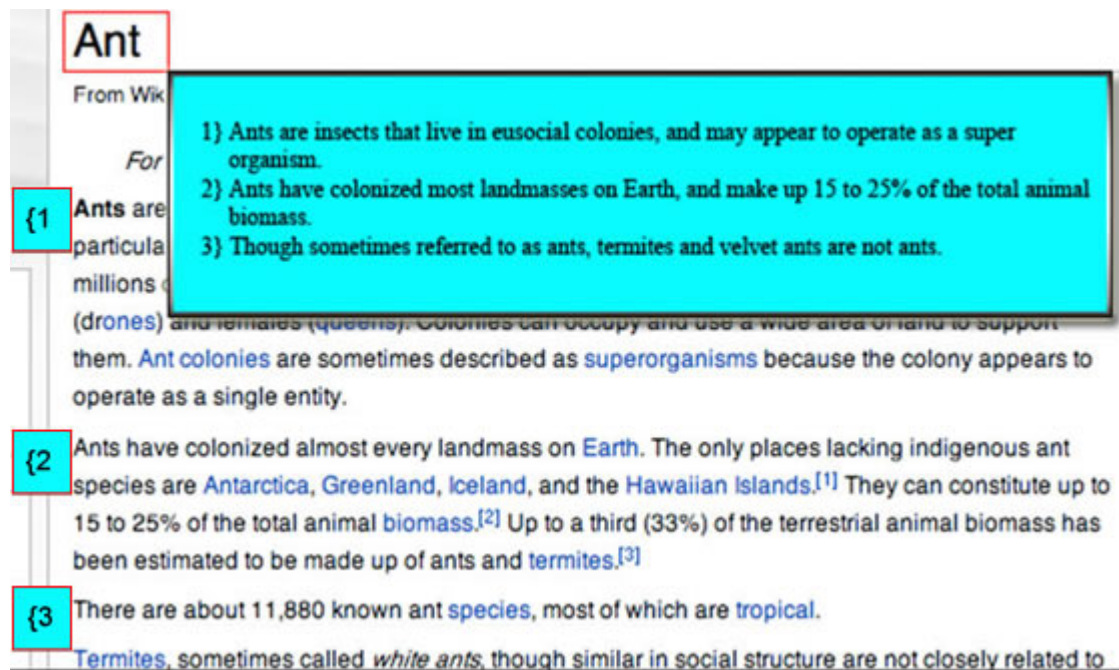
Figure 3.26 A dynamic pop-up QuikScan summary

3.5   Summary

In this chapter, I have introduced the design of QuikScan in both print and online environments. I first explained the two major categories of QuikScanning activities: originator-aligned and audience-aligned. I then introduced the basic design components: summaries and highlighting. I explained the numbering and lettering in the summaries and showed the value of highlighting. In addition, I presented extended

design ideas for using QuikScan in a variety of circumstances. Through examples and scenarios, I have associated the design with common reading goals, reader characteristics, and frequently used document formats. Finally, I discussed design solutions for using QuikScan on Web pages.

As I have shown, the design of QuikScan is solidly grounded in several fields of study, particularly reading signals and visual design techniques. My design integrates many existing techniques and maintains intuitiveness, parsimony, and simplicity. As a concluding note, I emphasize that QuikScanners should maintain flexibility when adopting these design strategies. In many situations, I believe a mixed strategy encompassing multiple design ideas is effective.

The design of QuikScan has not ended. I attempt to further refine the design and to expand its potential on the Internet. In the next chapter, I investigate the effects of my design on reading. I present two empirical studies conducted to explore how QuikScan benefits reading comprehension/retention and information seeking respectively.

Chapter 4: Empirical Validation

QuikScan has been developed to assist a wide variety of reading behaviors. An important purpose of this research, as I have indicated earlier, is to empirically examine the effects of QuikScan. Because of the complexities in the design of QuikScan, however, to study the effects of every design component in every reading context described in Chapter 3 is well beyond the scope of this dissertation. Instead, it focuses on two studies conducted to empirically investigate the effects of QuikScan on a number of prevalent reading behaviors. The first study, conducted in 2006, explores whether and how QuikScan facilitates reading comprehension and retention. The second study, conducted during late 2006 and early 2007, investigates whether and how QuikScan enhances information seeking.

It is important to note that QuikScan has steadily evolved and may continue to evolve. Therefore, these studies were conducted on a somewhat earlier version of QuikScan than that presented in Chapter 3. This earlier version slightly differs from the most recent one in that right-facing brackets are used in both summaries and the main body of text. In addition, due to the nature of the experimental passage, only Standard and Floating Summaries were used. The numbering restarts from 1 when a new summary appears, as opposed to the consecutive numbering introduced in Chapter3.

Both studies are informed by the literature. The first study is grounded on the research on reading signals and the cognitive processes of reading. The literature on

reading signals such as summaries, headings, and number signaling is particularly

helpful. The second study is grounded on the literature on information search theories,

information-seeking strategies, and the effects of reading signals on information

seeking.

4.1 Study 1: Reading Comprehension and Retention

An important goal of my research is to make QuikScan a desirable tool that

enables people to effectively comprehend and remember the content of a document.

This study investigates whether and how QuikScan facilitates reading comprehension

and retention of a long expository text when readers are relatively unfamiliar with the

subject matter. This section draws from "Improving Reading with QuikScan:

Introduction and Experimental Validation[10]" published in the proceedings of the 2007

International Professional Communication Conference (with David K. Farkas, 2007b).

4.1.1 Research Questions

Task area 2(a) in Chapter 1 is the focus of this study.

Research Question: Whether and how does QuikScan improve reading

comprehension and retention?

  a. Whether and how does QuikScan improve reading comprehension?

  b. Whether and how does QuikScan improve retention?

4.1.2 Method

A mixed approach encompassing quantitative and qualitative research was

chosen to investigate the effects of QuikScan on both comprehension and retention. A

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[10] A minor error in the data reported in this proceeding paper is corrected here in this dissertation.

multiple-choice questionnaire was used to test how well participants in this study

comprehended the experimental passage. The results of this questionnaire were

analyzed statistically. In addition, a survey was conducted to probe participants'

attitudes toward QuikScan. The survey includes both multiple-choice questions and an

open-ended question asking for participants' comments and suggestions. Researchers

have indicated that monomethods—that is using one single method—are limited to the

operational definition of that specific method (Tashakkori & Teddlie, 1998). Therefore,

it is insufficient to probe multiple aspects of a research activity, thus threatens research

validity (Tashakkori & Teddlie, 1998). Mixed methods, by contrast, can triangulate

data using multiple collections, and complement the shortcomings of a specific

method (Tashakkori & Teddlie, 1998). According to Tashakkori and Teddlie (1998),

there are many different ways to combine different methods in a research study. For

instance, researchers could use qualitative and quantitative methods sequentially or

use them simultaneously in parallel with one another, an approach called "equivalent

status design" (Tashakkori & Teddlie, 1998). Alternatively, researchers could

concentrate on one major method and use another method as complementary measure,

an approach termed "dominant-less dominant design" (Tashakkori & Teddlie, 1998).

In this study, I chose the multiple-choice questionnaire as the dominant method,

and regarded the survey as a method that can help explain results and add insights.

Multiple-choice test is effective for a variety of reasons. It provides better content

domain sampling because more content items can be represented in the

multiple-choice format as opposed to essay or open-ended questions (Haladyna, 1997).

Multiple-choice test can reduce the subjectivity in scoring, thus improving scoring

consistency (Haladyna, 1997).

4.1.3 Participants

Forty undergraduate students from the University of Washington participated

in this study during the summer and autumn quarter of 2006. Students who majored in

Economics, International Studies, and Business were excluded because the topic of the

experimental passage is concerned with global trade.

In this study I did not, for several reasons, distinguish between native and

non-native speakers. First, prior to the study, several pilot tests were conducted to

collect responses toward the experimental passage and the questionnaire. In these tests,

native and non-native English speakers exhibited similar performance. A likely reason

for their similar performance is that all students enrolled at the university must have

taken academic and language proficiency tests and fulfilled university requirements.

Second, the student body and backgrounds are heavily influenced by an increasingly

globalized education system. At the University of Washington, or similarly diverse

American universities, being a native or non-native speaker is not a prominent

determining factor on student performance. In a recent article published on *College*

Composition and Communication, Ortmeier-Hooper (2008) presents three case studies

showing that in today's United States, the boundary between native and non-native

English speakers is becoming fuzzy; students do not identify themselves as either ESL

(English as A Second Language) or native. Terms like "ESL" and "Generation 1.5"

are considered problematic by Ortmeier-Hooper because they depict a static and often

outdated image of student experiences. Therefore, I paid more attention, instead, on ensuring that some participants were not significantly more knowledgeable in the subject area than others. Finally, since QuikScan is likely to be a professional practice in the culturally diverse workplace in the U.S., the inclusion of non-native speakers is aimed at accurately reflecting such a mixture.

In this study, two participants did not perform in the expected manner. One of them was sleepy during the experiment; the other student spent significantly longer time in reading and question-answering. Hence, their data was not included in the analysis. In total, thirty-eight participants were included in the data analysis.

4.1.4 Materials

The main experimental passage that the participants read was excerpted and edited from Chapter II of the United Nations report "World Economic and Social Survey 2005: Financing for Development[11]." The passage was chosen for a variety of reasons. First, it was intended to be not too easy to read. Since the text contains specialized knowledge in global trade, it has a certain level of difficulty for those without such a background. I sought to avoid a "ceiling effect," in which the subjects would so easily comprehend and retain the content of the passage that the possible effects of QuikScan could not be determined. In retrospect, as explained below, the passage may have been overly difficult, creating a partial "floor effect." Second, the passage was intended to be interesting for the participants. The topic of global trade is

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[11] The original UN report can be found at:
http://www.un.org/esa/policy/wess/wess2005files/wess2005web.pdf (Accessed March 24th, 2008)

a popular topic in today's American society and politics, thus is interesting to the participants. I avoided technical topics such as biology and medicine for students' lack of interests in these topics may hinder this study. In addition, the passage fits with the standard expository model upon which QuikScan is primarily based.

The experimental passage was re-titled "Trade in the Developing World" to make it a standalone document. The original document was formatted with a wide main column for body text and a supplementary narrow column for pull quotes. All this formatting was removed in order to create a straightforward standard expository document. Tables and charts embedded in the original portion of the UN report were also removed. Although tables and charts help explain the content, they are not essential in this document. The participants would have spent a significant amount of time examining these tables and charts, and the processing of graphics was not relevant to the study.

Two researchers in the QuikScan Directed Research Group independently QuikScanned the document. Through comparing and negotiating, they settled on a final QuikScan version.

The materials used in this study are the following:

- The QuikScan version of the experimental passage "Trade in the Developing World" (Appendix D)
- The non-QuikScan version of the experimental passage (Appendix E)
- A comprehension questionnaire with 17 multiple-choice questions (Appendix F)

- A retention questionnaire with 17 multiple-choice questions (Appendix G)

- A brief survey on participants' attitude toward QuikScan (Appendix H)

Since the goal of this study was to examine how much participants understand and remember, the comprehension questionnaire consisted primarily of questions that require synthesizing and reference-making. The multiple-choice questions in this study reflect the lessons from Haladyna (1997)'s *Writing Test Items to Evaluate Higher Order Thinking*. Haladyna (1997) identifies several tried-and-true test item structure commonly used in multiple-choice questions such as "Which best defines...?" "Which of the following is an example of ...?" "What is the most effective for ...?" "Given..., what is the primary cause of...?" The multiple-choice questionnaire was designed by two researchers in the QuikScan Directed Research Group, discussed among other group members, and tested and revised based on pilot tests. When writing the multiple-choice items, I avoided opinion-based biases, avoided window dressing, and varied the position of the right answer (the correct answer is not always in the same position). I kept all choices independent so that they do not overlap with one another and create confusion. Distracters (the choice items other than the correct answer) were carefully chosen and worded so that they were plausible but false. There were five choices for each question, with one option as "I don't know." This option was included to prevent participants from purely guessing the answer. Participants were told to mark "I don't know" when they were not sure about the answer. The retention questionnaire used the same questions as the comprehension questionnaire

except that the sequence of the questions and the sequence of the multiple choices were rearranged. This was to ensure that participants' question-answering was not influenced by the way the questionnaire was structured.

In addition to the comprehension questionnaire, the survey contained four multiple-choice questions that probed participants' attitudes toward QuikScan:

1. How much attention did you give to the boxed summaries?

2. How much did QuikScan help you understand and/or remember the content?

3. Do you find QuikScan distracting?

4. Do you wish to use QuikScan in your reading in the future?

The question on distracting was asked because during pilot tests, a minority of participants found QuikScan somewhat distracting in certain circumstances. At the end of the survey, participants were asked to give further comments and suggestions about QuikScan.

4.1.5 Procedures

This study consisted of two sessions. On the first session, participants were randomly assigned to individually read either the QuikScan version or the non-QuikScan version of the experimental passage. They were given a maximum of 45 minutes to read. This time range was based on my pilot testing lessons. During reading, they were not allowed to take notes or communicate with one another. After that, all participants completed the comprehension questionnaire. They were not allowed to access the experimental passage during their question-answering. When

answering questions, they were not allowed to go back and change answers once they moved from one question to another.   Because these participants read and answered questions in the same room, it was necessary to ensure that their performance was not affected by others behaviors (For example, if some leave the room early, others may feel they were not performing well). Therefore, the participants were told that they were doing different things and the time needed for each participant may vary.

Upon completing the questionnaire, those who received the QuikScan version filled out the survey. A week later, participants came back for the second session on retention. They were asked to complete the retention questionnaire regarding the content they read a week ago.

4.1.6 Results

The data of this study consists of two parts: the answers to the questionnaire and the responses to the survey.

Data from the questionnaire was analyzed in SPSS 15.0 on a PC. An alpha level of .05 or less was considered as significant. Two t tests were conducted independently to examine the effects of QuikScan on comprehension and retention of the same document. The study found that those who read the QuikScan version (N=20, M=9.4000, SD=2.99825) performed significantly better than those who read the non-QuikScan version (N=18, M=7.1667, SD=3.31219) (t [df=36] =2.182, p<.05). QuikScan readers performed 13% better than non-QuikScan readers. Table 4.1 shows the correct rate for each question between QuikScan readers and non-QuikScan readers.

Table 4.1 Correct rate for each question

	QuikScan Readers	Non-QuikScan Readers
Question 1	12	2
Question 2	13	10
Question 3	17	10
Question 4	8	5
Question 5	18	13
Question 6	10	8
Question 7	15	5
Question 8	10	7
Question 9	5	3
Question 10	14	7
Question 11	11	10
Question 12	7	5
Question 13	10	6
Question 14	11	10
Question 15	5	2
Question 16	12	11
Question 17	17	15

However, the study did not find significant difference in retention between those who read the QuikScan version (N=15, M=8.1333, SD=3.52272) and those who read the non-QuikScan version (N=13, M=5.8462, SD=3.28751) (t [df=26] =1.767, p=.089).

The survey results show enthusiasm towards QuikScan. Tables 4.2 and 4.3 indicate the responses to the four multiple-choice survey questions. All participants who read the QuikScan version paid attention to the Boxed Summaries. Most participants found QuikScan helpful in understanding and remembering the content. More than half of the participants didn't find QuikScan distracting. While 25% participants were neutral, only 20% agreed that QuikScan is distracting. Most participants would like to use QuikScan in the future.

Table 4.2 Study 1 survey results I

	A great deal	A significant amount	Some	Not much	Very little
How much attention did you give to the boxed summaries?	20%	60%	20%	0	0
How much did QuikScan help you understand and/or remember the content?	10%	45%	35%	10%	0

Table 4.3 Study 1 survey results II

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Do you find QuikScan distracting?	0	20%	25%	20%	35%
Do you wish to use QuikScan in your reading in the future?	20%	50%	15%	15%	0

In addition to these four questions, an open-ended question was asked at the end: other comments and suggestions? The following are participants' responses:

- *The QuikScan helped to focus my reading of the material. This is the first report on this subject that I've ever read, so it was easy for me to get lost in the names and jargon. An added suggestion to go back and read the QuikScan after reading the passage may be useful to some readers.*

- *I know very little about economy and economic ***** [unrecognizable]*, so my performance may have a lot to do w/ my very low vocalbulary and limited understanding. But the QuikScan helped me zero in on main points, despite my lack of knowledge.*

- *While QuikScan was effective at establishing the content of the upcoming passage, it's presence also served to interrupt the flow of the writing. So although it may have been helpful at retention, it was a bit inconvenient and occasionally awkward.*

- *I typically have a hard-time absorbing information from reports*

such as this one; however, I felt that the QuikScan added an extra level of reenforcement to the "key topics". This additional emphasis on the key topics truly allowed me to retain more information, (and specifically more of the pertinent information) from this report.

- *I don't know if I'd want to use QuickScan all the time-in some readings I really like drinking in all the details without little reminders about what the basic ideas are breaking up the text. However, in reports like this, where a lot of information that can be boiled down to basic ideas is presented, I found QuikScan very helpful and effective.*

- *QuikScan include more than 1st sentence of corresponding paragraph.*

- *Because I was unfamiliar with the subject, sometimes the QuikScan summaries were confusing because they used undefined terms. I was also wary of the summaries because of a leveling and sharpening effect, by which they might ignore subtleties. This lead me to spend time checking the summary against the text on occasion. While I didn't notice a large effect, that's specific to this summary and not to the method in general. The summaries were especially useful for some passages that I found hard going due to the unfamiliar material. I'm curious how I would react to them for material in my own discipline.*

- *I think the words use in the box should be more easy understanding. I think the QuikScan method is a good way to study. It will be a lot helpful if the QuikScan is used in a textbook.*

- *The boxed QuikScan format was nicer and helped highlight those points better than the greyed numbers.*

- *Having little to no experience in world trade, I found that the boxed QuikScan portions effectively summarized the main points and smoothed the flow of information that was sometimes difficult to understand. However, this article did contain a lot of specialized jargon that hindered my ability to focus on the subject matter. Overall, the addition to the QuikScan synopses was more beneficial than distracting.*

- *QuikScan helps a lay-person in the topic to understand what is*

important in a given technical document.

4.1.7 Discussion

The results of this study indicate that QuikScan significantly improves reading

comprehension of a long expository text when readers are relatively unfamiliar with

the subject matter. This means that by using Boxed Summaries and numbers,

participants were able to grasp the complex relationships among content items

significantly better than those who read the non-QuikScan version. Their response to

the survey reconfirms this conclusion. Most participants emphasized the value of

QuikScan on documents that are unfamiliar to them. One participant mentioned that

he or she may adopt different reading strategies toward different types of documents.

"I really like drinking in all the details without little reminders about what the basic

ideas are breaking up the text." But this participant did note, specifically, that reading

a document like the one used in this study benefits from QuikScan. This is likely due

to the fact that the experimental passage is relatively difficult, long, and employs a low

frequency of headings. The fact that a number of participants found the passage

unfamiliar and difficult might mean that the study has a "floor effect." Although the

results were significant, those who read the QuikScanned version did not perform as

well as I had initially anticipated. Participants encountered some unfamiliar

terminology in the experimental passage. On the one hand, QuikScan helped

summarize the main points and "smoothed the flow of information." On the other

hand, one participant found that the unfamiliar terms contained in the summaries made

the summaries harder to understand because these terms are not fully explained in the

summaries. This participant further pointed out that it may be due to the way this particular document was QuikScanned, rather than the QuikScan format itself. One of the principles of QuikScanning is to strive to write summary text so that it is as broadly accessible and modular as possible. That is, ideally readers should be able look at any summary and understand it. This goal, however, will not always be fully achievable, and the QuikScanning of this text appears not to have fully met this goal—at least for this participant. Intriguingly, another participant mentioned that QuikScan can be very helpful in a textbook. This might be due to the fact that textbooks are meant to teach the audience; hence, learners can learn more efficiently if the superordinate information a textbook emphasizes is QuikScanned.

Interestingly, although the retention results were near-significant, those who read the QuikScan version didn't perform significantly better than those who read the non-QuikScan version. However, I believe that this is very likely due to the limited number of participants (28) who came back for the retention test. Although the results here were not statistically significant, some participants pointed out in the survey that QuikScan helped them retain information. Therefore, the results of the retention test are too inadequate to draw a conclusion. Had more participants came back for the retention test, the results would have been possibly more significant assuming that pariticpants behave in a normal way. I give suggestions on further research on the effects of QuikScan on retention in Chapter 8.

4.2   Study 2: Information Seeking

An important distinction between my research and most other studies in the

literature on reading lies in the fact that I intend to optimize QuikScan not only for reading comprehension and retention but also for information seeking. In this study, I investigate the effects of QuikScan on information seeking. Before I explain the research questions of this study, I first introduce three types of information seeking involved in QuikScan: *cued information seeking*, *partially cued information seeking*, and *uncued information seeking*.

First, readers seek the information directly cued by QuikScan (*cued information seeking*). This entails information contained in the summaries and items highlighted in the main body of text. Because these content items are cued, readers are able to locate them in the main body of text without spending a significant time reading the whole body text. Second, readers seek information partially cued by QuikScan (*partially cued information seeking*). These include the content items that are partially mentioned in QuikScan summaries or highlighting. For example, an important concept might be mentioned in the summaries but to gain a full understanding, readers need to read a significant amount of body text. Third, readers seek information not cued by QuikScan at all (*uncued information seeking*). These content items are not included in the summaries and are not highlighted in the main body of text. The empirical investigation in this study was centered on these three types of information seeking tasks.

4.2.1 Research Questions

Task area 2 (b) in Chapter 1 is the theme of this study.

Research Question: Whether and how does QuikScan improve information

seeking?

a. Whether and how does QuikScan improve cued information seeking?

b. Whether and how does QuikScan improve partially cued information seeking?

c. Whether and how does QuikScan improve uncued information seeking?

4.2.2 Method

This study focuses on the accuracy and efficiency of information seeking. A multiple-choice questionnaire was used to test the accuracy of participants' information seeking. To probe information seeking efficiency, the answering for each question was timed. At the end, a survey was conducted to investigate participants' attitudes toward QuikScan. The survey included both multiple-choice questions and an open-ended question asking for participants' comments and suggestions.

4.2.3 Participants

Forty students at the University of Washington participated in this study. Students who majored in Economics, International Studies, and Business were excluded because the content of the experimental passage is on global trade. For the same reasons as Study 1, this study did not distinguish between native and non-native English speakers. Additionally, none of the participants in this study had read the experimental passage or had participated in Study 1.

4.2.4 Materials

This study is based on the same experimental passage used in Study 1. The

QuikScan version and the non-QuikScan version of the experimental passage were also the same as Study 1. The following materials were used:

- The QuikScan version of the experimental passage "Trade in the Developing World" (Appendix D)

- The non-QuikScan version of the experimental passage (Appendix E)

- An Information seeking questionnaire with 18 multiple-choice questions (Appendix L)

- A brief survey on how the participants think of QuikScan (Appendix M)

To investigate the three types of information seeking in QuikScan, the information-seeking questionnaire contained three types of questions (Table 4.4). Type I questions asked for information cued by QuikScan. Type II questions asked for information partially cued by QuikScan. Type III questions asked for information not cued by QuikScan. I categorized these questions in consultation with members of the QuikScan Research Group.

Table 4.4 Three types of information seeking questions

Question types	Information seeking tasks	Number of questions
Type I questions	Cued information seeking	6
Type II questions	Partially cued information seeking	6
Type III questions	Uncued information seeking	6

The main purpose of this study was to examine how fast participants answer information-seeking questions and how well they perform on these questions. Information seeking, as defined in this study, is not entirely the same as information

search. To successfully answer some of the multiple-choice questions, participants had to not only search for details but also digest the document. Questions included both searching for facts and making inferences.

The multiple-choices questions in this study reflect the lessons from Haladyna (1997)'s *Writing Test Items to Evaluate Higher Order Thinking*. There were five choices for each question, with one option as "I don't know." This option was included to prevent the participants from purely guessing the answer. They were told to mark "I don't know" when they were not sure about the answer. All five choices of the same question fitted on the same page. This was to ensure that participants did not have to flip pages in order to see the whole question and its choices. Flipping pages may cause participants to spend time and slow down their question-answering.

In addition to the information seeking questionnaire, the survey contained five multiple-choice questions:

1. How much attention did you give to the Boxed Summaries?

2. How much did QuikScan help you find items of information you were looking for

3. How much did QuikScan help you understand and/or remember the content?

4. Do you find QuikScan distracting?

5. Do you wish to use QuikScan in your reading in the future?

At the end of the survey, participants were asked to give further comments and suggestions about QuikScan.

4.2.5 Procedures

Participants were randomly assigned to either the QuikScan or the non-QuikScan version of the report. They were given 10 minutes to read the document before they received the information-seeking questionnaire. Because the document is long and relatively difficult, this 10-minute period was to familiarize the participants with the subject that they don't have prior knowledge in. This was also to avoid the "floor effect" seen in Study 1. In order to keep participants in their own natural reading mode, I did not specifically tell them how to read. But those who received the QuikScan version were told to make the most use of QuikScan.

After the 10-minute reading period, each participant was given the information-seeking questionnaire. They were told to answer the questions as quickly and accurately as possible. Timing started when each of them started to answer the questionnaire[12]. They were allowed but not required to access the document during question-answering. They were required to inform the researcher immediately after they finished each question and were told to immediately start the next question. The time they spent answering each question was recorded. After answering the questionnaire, those who read the QuikScan version filled out the survey form.

4.2.6 Results

This study generated three types of data: the answers to the questionnaire, the time spent answering the questions, and the responses to the survey. The results from

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[12] An online stopwatch was used for the timing in this study:
http://www.shodor.org/interactivate/activities/Stopwatch/?version=1.4.2&brow (Accessed March 24th, 2008)

the questionnaire were analyzed in SPSS 15.0 on a PC. An alpha level of .05 or less was considered as significant.

A MANOVA was conducted to examine the effects of QuikScan on 8 dependent variables:

- The number of correct answers to Type I questions

- The time spent on answering Type I questions

- The number of correct answers to Type II questions

- The time spent on answering Type II questions

- The number of correct answers to Type III questions

- The time spent on answering Type III questions

- The total number of correct answers

- The total time spent on answering all questions

The Wilks Lambda multivariate test was significant ($F_{(7, 32)} = 4.362$, $p < .05$). This means that those who read QuikScan and those who read the non-QuikScan version exhibited significantly different performance. The univariate test of document type difference (QuikScan vs. non-QuikScan) shows significant difference on the time spent on answering Type I questions ($p < .05$) between the QuikScan group (N=20, M=303.05, SD=118.83) and the non-QuikScan group (N=20, M=553.40, SD=243.93). There are significant differences in the time spent on answering Type II questions ($p < .05$) between the QuikScan group (N=20, M=480.80, SD=244.93) and the non-QuikScan group (N=20, M=737.25, SD=382.72). There are also significant difference on the total time spent answering all questions ($p < .05$) between the

QuikScan group (N=20, M=1285.80, SD=534.18) and the non-QuikScan group (N=20, M=1926.65, SD=750.31).

However, the study did not find significant difference on the number of correct answers for Type I questions (QUIKSCAN: N=20, M=3.65, SD=1.53; NON-QUIKSCAN: N=20, M=3.05, SD=1.23), Type II questions (QUIKSCAN: N=20, M=1.75, SD=1.07; NON-QUIKSCAN: N=20, M=2.00, SD=1.17), Type III questions (QUIKSCAN: N=20, M=3.05, SD=1.61; NON-QUIKSCAN: N=20, M=3.90, SD=1.77), and all questions (QUIKSCAN: N=20, M=8.45, SD=2.95; NON-QUIKSCAN: N=20, M=8.85, SD=3.15). In addition, no significant results were found on the time spent on answering Type III questions (p>.05) between the QuikScan group (N=20, M=501.95, SD=224.00) and the non-QuikScan group (N=20, M=636.00, SD=215.56).

In addition to comparing the QuikScan and the non-QuikScan group, it is important to investigate whether participants in each group spent significantly different amounts of time answering the three types of questions. Specifically, I intended to examine the time each group spent on each type of questions, which would help me understand whether the participants were more efficiently in finding information cued by QuikScan. If this is true, it implies that QuikScan not only facilitates information seeking in a document as a whole, but is particularly effective in providing accessibility.

A one-way repeated measures ANOVA was conducted to investigate the effects of question type (I, II, III) on the information seeking time by those who used

QuikScan. Repeated measures tests were used because all participants were exposed to the three types of questions. The results from the analysis indicate that the Mauchly's Sphericity Test is not significant (p=.461). Therefore, the Tests of Within-Subjects Effects can be interpreted. The result shows that the within-subjects variable of document type is significant, $F (2, 38) = 16.36$, $p < .000$. This means that QuikScan readers spent significantly different amount of time on the three types of questions. Specifically, Tests of Within-Subjects Contrasts and Pairwise Comparisons show that QuikScan readers performed significantly faster on Type I questions (N=20, M=303.05, SD=118.83) than on Type II questions (N=20, M=480.8, SD=244.93) ($p < .05$) and Type III questions (N=20, M=501.95, SD=224) ($p < .05$). It shows that QuikScan readers did not perform significant faster on Type II questions (N=20, M=480.8, SD=244.93) than on Type III questions (N=20, M=501.95, SD=224) ($p > .05$). Multivariate Tests show that the overall difference in the time spent on the three types of questions is significant ($p < .05$).

Another one-way repeated measure ANOVA was conducted to investigate the effects of question type (I, II, III) on information seeking time by those who used the non-QuikScan version. The results from the analysis indicate that the Mauchly's Sphericity Test is significant ($p < .05$). Therefore, Multivariate Tests can be interpreted. The results (Pillai's Trace, Wilks' Lambda, Hotelling's Trace, Roy's Largest Root) show significant results ($p < .05$). The results are not as significant as the Multivariate Tests of the QuikScan group. Specifically, Tests of Within-Subjects Contrasts and Pairwise Comparisons show that non-QuikScan readers performed significantly faster

on Type I questions (N=20, M=553.4, SD=243.93) than on Type II questions (N=20,

M=737.25, SD=382.72) (p<.05). However, non-QuikScan readers did not performed

significantly faster on Type II questions (N=20, M=737.25, SD=382.72) than on Type

III questions (N=20, M=636, SD=215.56) (p>.05). They also did not perform

significantly faster on Type I questions (N=20, M=553.4, SD=243.93) than on Type

III questions (N=20, M=636, SD=215.56) (p>.05).

The survey results, like Study 1, show participants' enthusiasm toward

QuikScan. Tables 4.5 and 4.6 show the responses to the five multiple-choice survey

questions. All participants who read the QuikScan version gave attention to the Boxed

Summaries. Most participants found QuikScan helpful in seeking information. More

than half of the participants found QuikScan helpful for understanding and

remembering the content. Most participants didn't find QuikScan distracting. A large

majority of participants would like to adopt QuikScan in their future reading.

Table 4.5 Study 2 survey results I

	A great deal	A significant amount	Some	Not much	Very little
How much attention did you give to the boxed summaries?	40%	45%	15%	0	0
How much did QuikScan help you find items of information you were looking for?	30%	40%	20%	10%	0
How much did QuikScan help you understand and/or remember the content?	5%	40% (understand) / 35% (remember)	40% (understand) / 45% (remember)	10%	5%

Table 4.6 Study 2 survey results II

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Do you find QuikScan distracting?	0	5%	15%	65%	15%
Do you wish to use QuikScan in your reading in the future?	30%	50%	10%	5%	5%

In addition to these five questions, an open-ended question was asked at the end: other comments and suggestions? The following are participants' responses:

- *I enjoyed reading the report and QuikScan did provide me with the ability to get more information from the report in a short or limited amount of time. The limitation of not being able to go back to a question made me read the questions with more concentration.*

- *Not many headers, so QuikScan was used instead.*

- *Why are there no headings and subheadings? Headings usually help to enforce my reading—each QuikScan sentence is sort of like a heading in itself, but a broader heading for each box may have been helpful for reference's sake.*

- *I only used it because I had limited time. If I was reading the paper for personal interest or for work/school, I would of found QuikScan annoying. All of that information should just be in the intro of each section.*

- *The quikscan format was very helpful to quickly access where something was located within the paper. It gave great "jumping in" points to find answers to the questions. Great work.*

- *QuikScan was very useful for gathering the overall summary of a section/paragraph, but the questions were very specific and so I had to rely on scanning the document myself. However, I remember what QuikScan pointed out or highlighted much more than what I found when quickly scanning the document.*

- *I didn't know if the QuikScan box was enough for me to read. I questioned whether there were parts I was missing by not reading the whole document.*

- *It helped me navigate through the document in search for answers.*

4.2.7 Discussion

The MANOVA test shows that QuikScan readers performed significantly faster than non-QuikScan readers on Type I questions, Type II questions, and on all questions. Although statistically insignificant, QuikScan readers also performed faster than non-QuikScan readers on Type III questions. Except for Type I questions, non-QuikScan readers had a higher correct-response rate on the question-answering. However, the difference between QuikScan readers and non-QuikScan readers were insignificant. In fact, the two groups were very similar on their correct-response rate.

This means that those who used QuikScan found the information cued by QuikScan (Type I questions) much faster than those without QuikScan while maintaining a higher correct rate (although insignificant). Readers also found information that was partially cued by QuikScan (Type II questions) a lot more rapidly than those without QuikScan. Readers of QuikScanned documents even found uncued information faster than those without QuikScan (although insignificant).

These results, shown in Figure 4.1, indicate QuikScan can be an effective tool for seeking information selectively. One participant mentioned in the survey that he or she remembered the information cued by QuikScan much better than the items of information he or she was scanning by him or herself. Another participant pointed out that he or she wasn't sure whether certain important information was left out by the QuikScan summaries. This may imply that because QuikScan emphasizes superordinate information, readers' attention is likely to be focused more on the cued

items and less on the uncued items. This seems to explain why QuikScan readers

obtained more correct answers on Type I questions but not on Type II and III

questions. This also reconfirms the Nevid and Lampmann's (2003) finding that

signaling superordinate information may be done at the cost of unsignaled information.

This study, together with Study 1, seems to suggest that QuikScan can improve

general reading comprehension, and particularly the comprehension of the target

information, but may not improve the comprehension of those not signaled by

QuikScan. Nevertheless, the overall survey responses show that participants found

QuikScan particularly valuable for information seeking under time pressure.
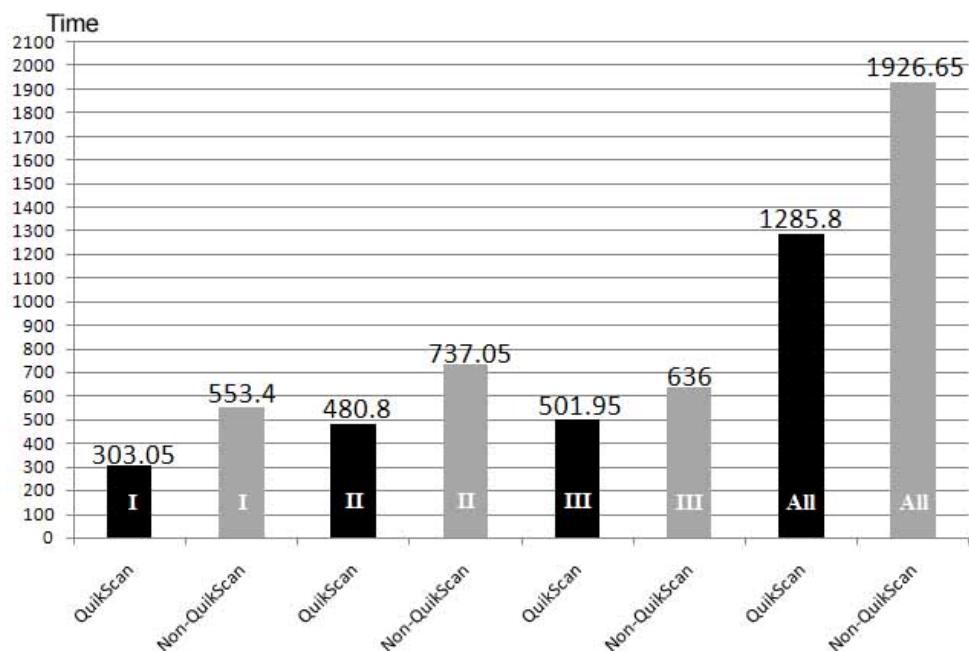
Figure 4.1 The amount of information seeking time by QuikScan and non-QuikScan groups

In addition, the two one-way ANOVAs reveal that when QuikScan was present,

readers found cued information significantly faster than both partially cued and

uncued information; but when QuikScan was not present, the difference among the

time readers spent on each of the three types of questions was small. In other words, the presence of QuikScan made certain information particularly noticeable and enabled the QuikScan readers to find this information much faster than information in the rest of the experimental passage. This seems to reconfirm participants' survey responses that they were able to use QuikScan to jump in the experimental passage and find answers more conveniently.

Additionally, the QuikScanning of the experimental passage in this study, notably, is originator-aligned. The QuikScanners tried their best to adhere to the meaning of the original authors. It is reasonable to believe that when the QuikScanning is heavily audience-aligned—that is when non-superordinate information of the original document makes it to the summaries—readers with QuikScan who are looking for such information may perform much faster than those without QuikScan. If readers look for information that is not considered superordinate by the original author, the absence of QuikScan can significantly hinder their information seeking. Finally, since the circumstance of my studies is specific, it would be interesting to explore how QuikScan works in other situations such as when a document is much more difficult and when the readers are not interested in the subject matter.

This chapter probes the QuikScan reading process solely from an empirical angle. In order to fully understand how readers interact with QuikScanned documents, particularly how readers interact with the originator of the documents and the QuikScanner, we need to explore the rhetorical nature of reading a QuikScanned

document. In the next chapter, I delve into the rhetorical process of QuikScan and

demonstrate its dynamic implications.

Chapter 5: Rhetorical Implications

Anything which makes a functional use of words will always be involved in all the technical problems of words, including rhetorical problems.

—Northrop Frye

The practice of information design has been historically centered on pragmatic aspects. Much work in this arena has been taking an engineering problem-solving approach: Whether things work or not. For instance, document designers are concerned with how to use graphs and tables; empiricists track users' eye movement on a computer screen; writers are interested in which typeface best suits a troubleshooting manual. When studying the design of information products, researchers and practitioners often substitute rhetorical analysis with design solutions and experimental research. Even when researchers have taken the step to treat information design less in empirical terms and more in its social dimensions, the attention on the rhetorical context, particularly the discourse between the author and the reader, has been insufficient. This insufficiency sets the impetus for this chapter. Simply put, QuikScan is a communication process situated in the dynamic interaction of the author, the QuikScanner, and the reader. It joins, and often complicates, the dialog between the author and the reader.

In this chapter, I bring to the foreground the longstanding interests of many technical communication scholars and rhetoricians in author-reader relationships. Drawing upon theories of author, authority, power, and reading, I demonstrate the multi-faceted roles of the QuikScanner and QuikScan readers (those who read

QuikScanned documents). I analyze the reader through the lens of major

reader-response theories and give insights into the QuikScan process. Using QuikScan

as a test bed, I analyze the dynamic interactions among the QuikScanner, the

addressed reader, the invoked reader, and the involved reader. In doing so, I bring

fresh perspectives to our understanding of newly emergent formatting techniques that

act as an intermediary in the author-reader dialog. Thus in this chapter I hope to

re-ignite interests in reader response theory and add my own contribution to that

theory.

Before explaining the details of my insights, I'd like to clarify a number of

terms frequently used in this chapter.

The QuikScanner is the person who transforms an original document into the

QuikScan format.

The QuikScan reader is the audience who reads QuikScanned documents.

QuikScan is used both as a noun and as a verb. When it's used as a noun, it

means the whole concept of QuikScan. When used as a verb, it means the act of

transforming a document into the QuikScan format. For example, "they QuikScan a

document," "she QuikScans a document," "QuikScanning a document."

5.1 The QuikScanner: Toward a Multi-faceted View

Before a QuikScanner QuikScans a document, she has to read and understand

it. Then she strategizes the QuikScanning based on her goals and her readers' needs.

She produces a QuikScanned document that accords with the semantic meaning of the

original document yet substantially alters the reading experience, forming a distinctive

discourse.

5.1.1 The QuikScanner as Reader

As a reader, the QuikScanner has the responsibility is to digest the semantic meaning of the original document and identify its superordinate ideas, or gist. The QuikScanner must adhere to the original author's messages and accurately present them. But this is not to say that she is merely a "receiver of information" (Coney, 1992). In her landmark article *Technical Readers and Their Rhetorical Roles*, Coney constructs a reader taxonomy that conceives the receiver of information as "a kind of passive consumer of the products of positivist efforts" (p. 59).

QuikScan's goal of emphasizing superordinate ideas and important details reflects reader needs and implies that QuikScan is an inherently reader-centered activity. The overall process of reading is not a process of receiving, but rather that of digesting, judging, distinguishing, and negotiating. Therefore, within Coney's (1992) technical reader taxonomy, a term more appropriate to illustrate the QuikScanner is "maker of meaning." Coney explains, "the text and the author neither control nor even create meaning; at best they provide the occasion for readers to exercise their interpretive autonomy" (p. 61). This identity of "maker of meaning" can be seen in any QuikScan activity but is particularly pararmount when the QuikScanning is heavily influence by the audience community. The QuikScanner makes meaning by interpreting and, most importantly, tailoring the original document toward particular goals and needs.

To fully understand how the reader reads text, reader-response critics have

introduced a number of influential concepts including the "invoked reader" (Ede &

Lunsford, 1984). Scholars have employed different terms to describe this role,

including "implied reader," (Iser, 1974), "virtual reader," (Prince, 1980), "inside

reader," (Sherbo, 1969), "fictitious reader," (Ong, 1975), "authorial reader,"

(Rabinowitz, 1987), and "rhetorical reader" (Coney, 1992).To keep it simple, I use

"invoked reader" throughout this chapter. The invoked reader differs from the actual

reader in that it is assigned by the author. It is "a role that must be assumed, a set of

values, attitudes, biases, even facts that must be known and accepted if the text is to be

read and understood" (Coney, 1987, p. 323). Thralls, Blyler and Ewald (1988) point

out that the invoked reader is "not a living person external to the text but exists as an

abstraction to be shaped within the text" (p. 47).

In the context of QuikScan, it is important to note that when the original author

wrote the document, he or she did not intend to have it QuikScanned. His or her

invoked reader is neither someone who expects to read a QuikScanned version of the

document nor someone who expects to read the document with the intention to

QuikScan it. On the other hand, the QuikScanner brings her readers' needs to her

reading the existing document.

There are times when the QuikScanner feels uncomfortable when reading and

QuikScanning a document. Let us imagine the scenario of a QuikScanner who

possesses liberal political values trying to QuikScan a politically conservative

document for the benefit of her circle of liberal friends who regularly discuss politics

and ideology. She may disagree with the content and opinions. Thus, she may not feel

comfortable to be that assumed "you" the author refers to. This makes her an

"excluded reader" (Goodwin, 1991). Excluded readers, according to Goodwin (1991),

are those who resist a document and refuse to accept the invoked reader assigned by

the author. An even more intriguing thing happens when the QuikScanner has to

QuikScan a document *she* finds hostile. In fact, this may happen quite often when the

QuikScanner is hired to work on documents not for personal interests, but as part of

her job. In this situation, the QuikScanner is not only an "excluded reader" but also an

"enforced reader" (Goodwin, 1991), a scenario Goodwin (1991) called "worst

situation" (p. 103). An enforced reader, as its name suggests, is someone who resists

to but has to take on the invoked reader role assigned by the author (Goodwin, 1991).

In these situations, the QuikScanner as reader and the invoked reader of the

original document are in conflict. However, such a content-related conflict may

happen in any writing process. A writer of marketing material, for example, may be

required to describe the virtues of a product she does not respect. Leaving aside the

serious ethical dimensions of this situation, this kind of ethical conflict has no

particular ties with the nature of QuikScan. It is important to note that whether the

QuikScanner accepts or rejects the invoked reader of the original document, this

invoked reader always has an impact on how the QuikScanner invokes her own image

of the QuikScan reader (the invoked reader of the QuikScanned document). I explain

the complexities in the next section.

5.1.2 The QuikScanner as Augmenter

Despite the importance of reading the original document, the QuikScanner is

largely defined by her creative work on the existing document.

Adapting and Augmenting

The image of a person altering an existing document brings to mind the

author's editor. Speck (1992) uses the author's editor as a context to explain the need

for professional writing teachers to engage with students collaboratively. Speck (1992)

points out that an author's editor must maintain the original author's ideas and, at the

same time, fulfill reader's needs. However, he considered the author's editor merely as

"servant":

> The author's editor recognizes that the author has authority to accept or
> reject the author's editor's recommendations. Thus the author's editor
> is a servant whose goal is not to gain power through position, but to
> serve through the use of rhetorical skills. The author's editor must
> convince an author that a change merits acceptance. The author's editor
> cannot decree that the author make changes. (p. 48-49)

First, let me challenge Speck's unfortunate characterization of an editor as a

"servant." Speck would have done much better to simply note that editors typically

work in an advisory capacity. The author of the original document is typically not

involved in the QuikScanning, which may take place long after the production of the

original document. Thus, the original author typically does not have direct contact

with the QuikScanner and will likely not review the QuikScanning.

Unlike the author's editor, the QuikScanner does not alter the existing text. Her

goal is not to polish or proofread writing with the purpose of making the same

document more appropriate. Her work consists of adding summaries and highlighting

while preserving the semantic meaning of the original document intact, complete, and

unchanged. The summaries and highlighting comprise a microcosm of the original

document that parallels—but is not identical to—the original document. Such a

shortened version contains valuable superordinate information and subordinate but

important details. The QuikScanner's responsibility is independent from that of the

original author and is dependent on her goals and target readers. Therefore, the

QuikScanner should not be considered as a "servant," (nor is an editor a servant), but

rather as someone who creates a discourse distinguishable from that of the original

document. I call the QuikScanner an "Augmenter." She is always the "rhetorical

bridge" between the author's messages and the reader's expectations. This act of

augmenting, undoubtedly, is more prominent when the QuikScanning is heavily

influenced by the target audience.

Figure 5.1 shows a typical augmenting process. The QuikScanner absorbs both

the original document and the needs of the target reader. She then transforms the

document into a QuikScanned version.
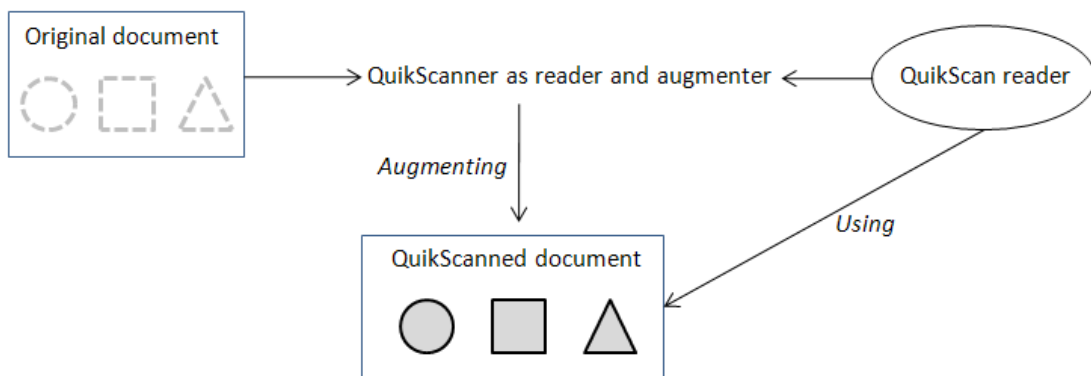
Figure 5.1 The QuikScanner's augmenting process

In Figure 5.1, the three shapes (circle, square, and triangle) represent the

superordinate ideas and important details of the existing document (or suited for

particular audience needs). These shapes are represented in dotted lines to indicate

their implicitness in the original document. However, they are represented with

outlining and filled shapes in the rectangle representing the QuikScanned document to

indicate their explicitness in the QuikScanned text.

Sharing Power, Contributing Meaning

To further investigate the role of the QuikScanner as augmenter, let us survey

how scholars in technical communication view the technical communicator, an

umbrella term encompassing the QuikScanner. The technical communicator has

traditionally been considered as possessing no power and making no meaning (Slack,

Miller, & Doak, 1993). Consider, for example, Speck's use of the term "servant." She

is merely a transmitter of messages or a translator of meanings (Slack et al., 1993).

Slack, Miller, and Doak (1993) analyze three distinct views of communication

(transmission, translation, and articulation) and advocate that the technical

communicator has the authoring power that is typically unrecognized. Their analysis

creates a way to illustrate the nature of the QuikScanner as an augmenter.

From the transmission view, the technical writer's job is "to assure that

messages are accurately encoded and that they are transmitted with minimal noise

over clear channels" (Slack et al., 1993, p. 18). Meaning is conveyed from one point to

another, a process in which the receiver is seen absent (Slack et al., 1993). "The

technical communicator remains the neutral vehicle facilitating the exercise of power."

(p. 14) The transmission view sees communication as the transportation of messages

and the power is solely owned by the sender (Slack et al., 1993). "Meaning," Slack et

al. explain, "is something that is 'packaged up' by the sender, shipped out, and

'unwrapped' by the receiver, who can then act or think accordingly" (p. 16). "Meaning

is a fixed entity; it moves in space 'whole cloth' from origin to destination." (Slack et

al., 1993, p. 16) The technical communicator is considered as "surrogate engineer"

who is "rendered essentially transparent" (Slack et al., 1993). Thus, meaning is

essentially determined by engineers, not the technical communicator and certainly not

the reader (Slack et al., 1993).

From the translation view, meanings are located "in the practice of encoding,

in the discursive product, and in the practice of decoding" (p. 22). Compared to the

transmission view, the translation view sees meaning as the results of sender-receiver

interaction and considers meaning as negotiated in the encoding and decoding process

(Slack et al., 1993). "Meaning is fluid and elusive, never really fixed at any moment."

(p. 22) "The translation view reconstitutes transmission to add an understanding of the

receiver's contribution to the constitution of meaning and introduces the constitutive

role of a mediator." (p. 25)

Slack et al.'s (1993) view on the role of the technical communicator finally

settles on the articulation view. "Articulation asserts that any identity in the social

formation must be understood as the nonnecessary connection between the elements

that constitute it." (p. 26) "Power is no longer understood as simply the power of a

sender over a receiver or as the negotiated symmetry of the sender's or receiver's

meanings but as that which draws and redraws the lines of articulation." (p. 28) Slack

et al. (1993) further advocate:

> Technical communicators are authors, even when they comply with the
> rules of discourse that deny them that recognition. (p. 31)

In the dynamic process of articulation, technical communicators add, delete, change

and select meaning (Slack et al., 1993), a process quite similar to that of the

QuikScanner.

Where does the QuikScanner fit among the three views of communication?

The QuikScanner does transmit. She has to maintain the neutrality of the original text,

whether she injects a special emphasis or not. In this regard, the QuikScanner is like a

manuscript editor, although, in contrast to the editor, the QuikScanner's

augmentations are visible, not submerged in the text. Yet, the very act of

QuikScanning is prompted by a specific purpose for a specific audience. Hence, while

transmitting is a part of the chain of actions taken by the QuikScanner, she is never

merely a "surrogate encoder" (Slack et al., 1993, p.19) or a transmitter.

The role of the QuikScanner also resembles, in part, that of a translator. The

process of digesting the gist of the original document is a process of decoding (or

deconstruction). The act of transforming a document to a QuikScanned version is a

process of encoding (or construction). Moreover, reading a QuikScanned document is

an act of decoding as well. The meaning generated by the reader can be different from

the one conveyed by the QuikScanner. The question is: does the QuikScanner's role

cease at that of a translator? Slack et al. (1993) point out that "translation based on the

model of encoding and decoding limits our understanding of the full authorial

contribution and power of the mediator" (p. 25).

QuikScan is a process in which the QuikScanner consults (physically and/or virtually) with the target reader, on a constant and iterative basis, and negotiates (physically and/or virtually) on what and how to summarize and highlight. This process does not merely consist of the "polar contributions of sender and receiver," (Slack et al., 1993, p. 25), but is constituted in "the relations of meaning and power operating in the entire context within which messages move" (Slack et al., 1993, p. 25). Thus, the articulation view is more suited for the QuikScan process.

The next question arises: is the QuikScanner an author, like the technical communicator in the eyes of Slack et al. (1993)? Undeniably, the QuikScan process involves creativity. Nevertheless, the picture of the QuikScanner does not fit perfectly with the frame of a typical technical writer who produces a document from scratch. The QuikScanner bases her content on an existing document. From an ethical and professional point of view, she can't claim authorship. Thus, she may not be considered as author.

However, the QuikScanner is not completely powerless. She facilitates a discourse distinguishable from that of the original document. The emphasis on the superordinate ideas and important details, and particularly the tailoring for the needs of the target audience, indicate that the QuikScanner shares power with the original author, and contributes meaning. The QuikScanned document can be seen as a new rhetorical experience, grounded on the framework of an existing document. The QuikScanner's shared power is granted through her articulation of meaning. Figure 5.2 illustrates the QuikScanner's role as a reader and an augmenter. As indicated

previously, she interacts with the invoked reader of the original author as she reads the

original document. The QuikScan reader, on the other hand, interacts with the invoked

reader of the QuikScanner. What is interesting here is how the formation of the

QuikScanner's invoked reader is necessarily and inescapably dependent on the

original author's invoked reader (curved arrow in Figure 5.2). In a normal situation,

the QuikScanner's invoked reader is much constrained by that of the original author,

for QuikScanning doesn't change or add semantic meaning to an existing document.

The exception would be the QuikScanning activities that are largely shaped by target

audience. Therefore, we may say that the QuikScanner's invoked reader is a result of

the process in which the QuikScanner shares power and makes meaning.
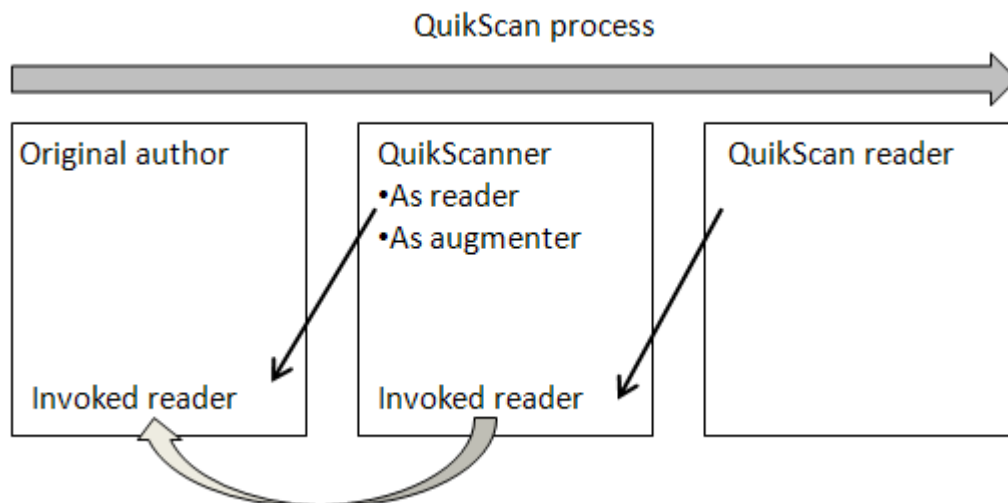
Figure 5.2 Roles of the QuikScanner in the QuikScan process

5.2 The QuikScan Reader: Toward a Multi-faceted View

"Without specific attention to the role of audience in the dynamics of the

communication situation, no discussion of audience can be complete." (Keene &

Barnes-Ostrander, 1985, p. 167) This is particularly true for the reader-centered

QuikScan process. In this section, I attempt to demonstrate the roles of the reader in the QuikScan process. To do so, it is worthwhile to trace major views of the reader in reader-response criticism. In this section, I analyze the QuikScan reader through the lens of some representative literary scholars and their views on the reader. These theories, early and recent, have been influential at different times. They are chosen not only for their distinctive views, but also for their relevance to QuikScan. Following such comparisons, I then articulate my view of the QuikScan reader.

5.2.1 The Reader through the Lens of Reader-Response Criticism

I analyze the views of the reader through the works of Gibson (1950), Ong (1975), Ede and Lunsford (1984), Blakeslee (1993), and Johnson (1997). They are presented chronologically to demonstrate the progress of thoughts on the reader in the past half a century.

Mock Reader: Gibson

Walker Gibson, in his 1950 article "Authors, Speakers, Readers, and Mock Readers," pointed out that readers assume the attitudes the text asks them to assume or throw it away. He argues that there are two readers in every reading experience; a real reader and a "mock reader." "The mock reader," explains Gibson, "is an artifact, controlled, simplified, abstracted out of the chaos of day-to-day sensation" (p. 266).

> The fact is that every time we open the pages of another piece of writing, we are embarked on a new adventure in which we become a new person—a person as controlled and definable and as remote from the chaotic self of daily life as the lover in the sonnet. (Gibson, 1950, p. 265)

Although the mock reader concept was a breakthrough, Gibson's theory is highly

influenced by the New Critical doctrine (Tompkins, 1995) in that the mock reader is a property of the text, thus purely textual.

Gibson's mock reader cannot be used to explain the value of the reader in the QuikScan process. Very often, the reader gets directly involved, a force to be acknowledged. Imagine a QuikScanner being hired to produce QuikScanned documents for an organization. She meets with the stakeholders on a regular basis during the QuikScan process. The organization, as the reader, would not simply try to match itself with the mock reader when it receives the final document. Unlike Gibson's reader who is "embarked on a new adventure," the organization exerts major influence on the QuikScan process. In Gibson's view, every time the reader receives a document, he or she simply asks "who do I want to pretend I am today?" (p. 267) In my scenario, by contrast, the organization would instead ask "*What did I tell the QuikScanner to do last time? Did she make the changes I wanted? What should she do next?*"

Fictionalized Reader: Ong
Walter Ong (1975) believes that the writer is always fictionalizing his or her audience. He points out:

> If the writer succeeds in writing, it is generally because he can fictionalize in his imagination an audience he has learned to know not from daily life but from earlier writers who were fictionalizing in their imagination audiences they had learned to know in still earlier writers, and so on back to the dawn of written narrative. (p. 11)

By "fiction," Ong means that the writers fictionalize and construct an imagined audience, and the audience fictionalizes itself and matches this construction. He argues,

somewhat like Gibson, that the readers of a text have to take on the role assigned

(fictionalized) by the author, a role that seldom resembles the role in the readers'

actual life. As Ong puts it, "they [real readers] have to know how to play the game of

being a member of an audience that 'really' does not exist" (p. 12).More interestingly,

he believes that each new role is based on previous ones, and these roles evolve

without explicit rules. The fiction stems from audiences of earlier, similar texts

(Coney, 1987). Ong notes:

> If the writer succeeds in writing, it is generally because he can
> fictionalize in his imagination an audience he has learned to know not
> from daily life but from earlier writer who were fictionalizing in their
> imagination audiences they had learned to know in still earlier writers,
> and so on back to the dawn of written narrative. (p. 11)
>
> . . . .
>
> With the possible exception noted above of persons in the presence of
> one another communicating by writing because of inability to
> communicate orally, the writer's audience is always a fiction. The
> historian, the scholar or scientist, and the simple letter writer all
> fictionalize their audiences, casting them in a made-up role and calling
> on them to play the role assigned. (p. 17)

Ong's "possible exception" is a frequent reality in QuikScan. Even when the

real reader is not physically present in the QuikScan process, the QuikScanner is

unlikely to base her work completely upon a fiction. I provide some examples later as

I articulate my view on this.

Audience Invoked and Addressed: Ede and Lunsford
Lisa Ede and Andrea Lunsford (1984) took a different approach than Gibson

and Ong[13]. They analyze the two views towards the audience: "audience addressed" and "audience invoked." They believe that the "audience addressed" is a concrete reality, very influenced by the tradition of audience analysis in speech communication, cognitive psychology, etc (Coney, 1987). "Audience invoked," by contrast, refers to Ong's (1975) fictionalized reader. Ede and Lunsford (1984) suggest that the "audience addressed" view ignores the dynamic rhetorical process in writing and the "audience invoked" view diminishes the role of the external reader.

Ede and Lunsford's view seems to be closer to the dynamic context of QuikScan in that they bridge the two views on the audience. Nevertheless, their argument does not explain the possible interactions when the QuikScan reader meets with the QuikScanner. This possibility, however, has been explained by researchers including Blakeslee (1993) and Johnson (1997).

Audience Involved, Dynamic Collaborators: Blakeslee, Johnson

Over the past two decades, a number of innovative technology-enhanced practices have emerged in technical communication such as usability testing, user-centered design, computer-supported information design, and ethnography. This development has stimulated the field's interests in the understanding of audience in these new contexts. Here, I analyze two articles by Ann Blakeslee and Robert Johnson respectively, and demonstrate why their views capture more closely the dynamic reality of QuikScan.

Blakeslee (1993) challenges the static dichotomy views (fictionalized

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[13] Ede and Lunsford further articulated their view on the audience in a 1996 article. However, their 1984 article has the most theoretical significance and is still influential today.

constructs and concrete realities) of the reader. She conducted ethnographic field studies on how physicists write, revise, and explain a scientific paper to biologists, chemists, and other physicists. The physicists, who are authors, worked collaboratively with their audience and obtained feedback (Blakeslee, 1993). "Rather than writing a text for an abstract audience, these authors engaged their readers in direct interactions to obtain a clearer sense of their concerns." (p. 24)

> The outcome of these actions suggests ways in which authors may extend their collaborative networks to support their text production and inventional processes and to assist them in generating new knowledge that will gain the adherence of their auditors. (p. 24)

Seeing reading as a constructive and socially influenced process, Blakeslee believes that the interactions between the author and the reader are not static. She explains, "authors and readers are in a constant interplay with each other, with authors hoping, ultimately, to convince readers to accept their ideas and perspectives" (p. 32). She sees the conflicts during this process as negotiations and collaborations. Through these collaborations, the authors and readers refine their work on an on-going basis (Blakeslee, 1993).

Robert Johnson (1997) examines the phenomenon of the audience participating in the usability studies, upon which he introduces the concept of "audience involved." His 1997 article is a major contribution in recent years that bridges new trends in technical communication with the theoretical understanding of the reader. He differentiates "audience involved" with "audience addressed" and "audience invoked":

> In contrast to the addressed or invoked models of audience, the involved audience is an actual participant in the writing process who

creates knowledge and determines much of the content of the discourse. (p. 363)

Through two usability case studies, he reveals that "audiences are not just for the writer's imagination" (p. 362). "The involved audience brings the audience literally into the open, making the intended audience a visible, physical, collaborative presence." (p.363) Departing from Ong's (1975) fictionalized reader, Johnson lays out a vivid instance where the communicator sees and talks with the intended audience, even before the usability studies take place. Expanding Ede and Lunsford's (1984) views on the reader, Johnson introduces an audience who directly "intervenes" in the production of discourse. This participation, Johnson notes, can be iterative and can allow multiples rounds of user feedback.

In QuikScan, the audience can certainly get involved. When QuikScan is implemented in a business situation, the QuikScanner is very likely to meet with audience (or a representative sample) prior to or during the QuikScanning activity. This encounter could be a meeting, an interview, a survey, a focus group, or an observational study. Whatever form it takes, it informs the QuikScanner of the needs, preferences, and expectations of her target audience. The QuikScan process, consequently, is analogous to the user-centered design process in which the usability of a document is the foci. In addition, there are stakeholders in a business situation as well. I explain their roles later in the chapter.

On the other hand, the QuikScanner doesn't always meet with the target reader (or a representative sample). The absence of the physical reader, however, does not

alter the fact that audience participates. In these situations, the QuikScanner inevitably

creates personas to maintain a vivid and specific picture of her target audience.

"Audience involved," although having theoretical freshness, only pictures one

possibility of reader participation in the QuikScan process.

Through the lens of some reader-response theories, I have shown that although

our views on the reader have progressed in the past half a century, no single view can

explain the dynamic communication involved in the QuikScan process. Next, I

demonstrate the roles of the QuikScan reader and the QuikScan process.

5.2.2 The Addressed, Invoked, and Involved QuikScan Reader: Multiple Dimensions

QuikScan encompasses all three views of the reader: addressed, invoked, and

involved[14]. Sometimes, a QuikScanning activity may only have the addressed and

invoked reader. Real readers don't participate physically like usability subjects.

Sometimes, however, a QuikScanning activity may have all three types.

Addressed and Invoked Reader: When the Reader is not Involved

QuikScan's reader-centeredness is determined by its nature: enhancing a

document for a particular purpose and a particular audience. Before, during, and after

the QuikScanning, the reader of QuikScanned documents influences and shapes the

production. In this section, I explain the influence of the addressed and the invoked

reader.

Imagine I am going to QuikScan this chapter for an audience who is interested

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[14] Like Johnson (1997) and Dayton (2003), I treat "audience involved" as a different concept from "audience addressed" and "audience invoked."

in the roles of the QuikScanner and the QuikScan reader but possesses little

knowledge of rhetoric. I do not have the chance to see or communicate with the

audience. The following is a transcript of my think-aloud diary:

> *My target audience is a group of readers who are interested in learning about the roles of the QuikScanner and the reader. These are people who don't know much about rhetoric. They are different from my primary target audience—dissertation committee members. While committee members examine this chapter critically, these other novice readers may find so many concepts completely new to them such as the "invoked reader." Thus, they may not be that interested in the in-depth analysis of rhetorical theories. <u>Therefore, I should take a pragmatic approach when writing summaries</u>. <u>The summaries should explain rhetorical theory in simple ways understandable to my readers. I should focus on how the QuikScanner and the reader participate in the process</u>. Some sections are long so <u>I should segment them using Floating Summaries</u>. This can make it easier for novice readers to understand me. Also, at places headings and sub-headings are used frequently, <u>I should use Compound Summaries in these places</u>. Note that I am still constrained by my obligation to highlight the superordinate ideas expressed in the document (who under most circumstances would be an author other than myself).*

In the above transcript, I intend to show just the portions of my thoughts that

are sufficient to make my point. Although I didn't see, hear, or meet the

flesh-and-blood reader, I was inevitably "invoking" them. I analyzed my audience

regarding their interests and needs. I then strategized how to augment the document

for a reader population that has little background knowledge. The underlined parts

indicate the results of my strategizing. This is a process in which the hegemony of the

author is replaced by a collaborative discourse.

> The resulting experience, while less efficient or predictable, frees the writer as well as the reader to form new alliances, to reshape communal knowledge and professional practice. (Coney, 1992, p. 61)

Note that my augmenting was achieved through the collaboration of both my role and that of the target reader. "The act of creating and maintaining roles is not solely the right and responsibility of the writer (as the New Critics and structuralists would argue) or the reader (as some reader-response critics such as Norman Holland and David Bleich would have us believe)." (Coney, 1992, p. 62)

Invoked and Involved Reader: Dynamic Participation

An important goal of QuikScan is to facilitate communication in organizations. I envision corporations, non-profit organizations, educational institutions, and government agencies implementing QukScan in their documents. Almost certainly such organizations will at times choose to involve potential readers of these documents in the process of QuikScanning. To illustrate this, let us consider the following scenarios:

> *Because a lengthy book is frequently used as standard material for preparing for a nationwide exam, its publisher plans to publish a QuikScanned version to help students understand and recall the main ideas more efficiently. The publisher hired a QuikScanner and recruited readers to participate in this process.*

There are very interesting implications in this scenario. First of all, the reader is "audience involved," much like the one advocated by Johnson (1997). Very likely, a sampled number of target readers will meet with the QuikScanner to explain their backgrounds and needs. They may be involved in the book development process once or iteratively. They may be asked to use the evolving document and provide feedback for each prototype.
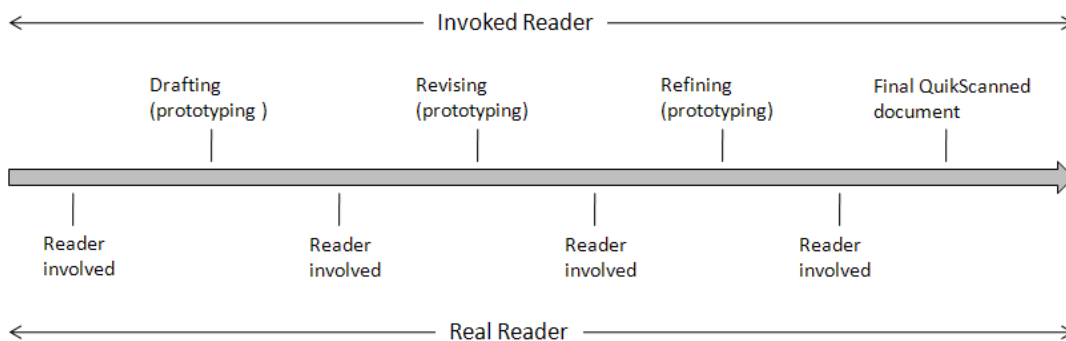
Figure 5.3 The iterative and dynamic participation of ever-changing real readers and ever-changing invoked readers in the QuikScan process

Figure 5.3 shows a scenario in which the target readers get involved four times during the QuikScanning process[15]. Before the QuikScanner starts drafting, the QuikScanner probes the readers' needs. For instance, what is important for the readers? How do the readers want the summaries be written—in an informative style or descriptive style? How numerous and specific should the list items be? In addition to the QuikScanning details, discussions could even include such considerations as limiting the length of the document or completing the project within a certain time range given a budget. In doing so, she not only hopes to set priorities for the QuikScanning, but also to enrich the invoked reader profile. Each time she interacts with the involved reader, such an interaction becomes the basis for the further evolution of the invoked reader, the next draft, and the upcoming reader involvement. All through the QuikScan process, she moves back and forth between the involved reader and the evolving invoked reader. Each interaction is built upon previous interactions. Figure 5.4 shows a scenario in

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[15] A similar approach was taken by Houser (1997) who constructs a similar graphic to show how technical communicators move back and forth between invoked and addressed audience. My approach differs from his in two ways. First of all, I use "involved reader" rather than "addressed" to describe those who interacts with the QuikScanner. Second, while Houser stresses the importance of audience for technical communicators, I draw upon his model and put a greater focus on the dynamic interactions and evolving relationships occurring in the QuikScan process.

which the real reader or a group of readers gets involved twice in the QuikScan process. The QuikScanner's invoked reader is influenced by the original author's invoked reader. As the real reader get involved for the first time, the QuikScanner's invoked reader changes. This interaction gives rise to a more enriched version of her invoked reader. In this progression, a later interaction is affected by the QuikScanner's previous interactions with the involved reader and her previous invoking, which is yet based upon previous interactions and previous invoking. I call this process "progression" not in a sense that the documents necessarily "progress" into better versions in a linear and one-way fashion. As a matter of fact, a change suggested in one interaction may prove ineffective during later interactions with the involved reader. For instance, a typeface problem was previously identified by an involved reader. But most readers, in further interactions, did not find it problematic. The QuikScanner needs to examine this feedback and adjust her work. By "progression," I mean the QuikScanner's growing knowledge about the target audience.

This progression contrasts with Ong's (1975) fictionalizing process. While Ong believes that the writer always fictionalizes the reader and such fictionalizing is built upon previous fictions, the QuikScanner's invoking is not purely fictionalizing, but a result of an accumulation of reader inquiry. The reader, in the QuikScan process, is empowered.

In Figure 5.4, the straight upward line does not intended to indicate a steady, inevitable pathway toward greater understanding of the reader. It is to show a general pattern: as the QuikScanner moves along the process, her understanding of the reader

increases dynamically.
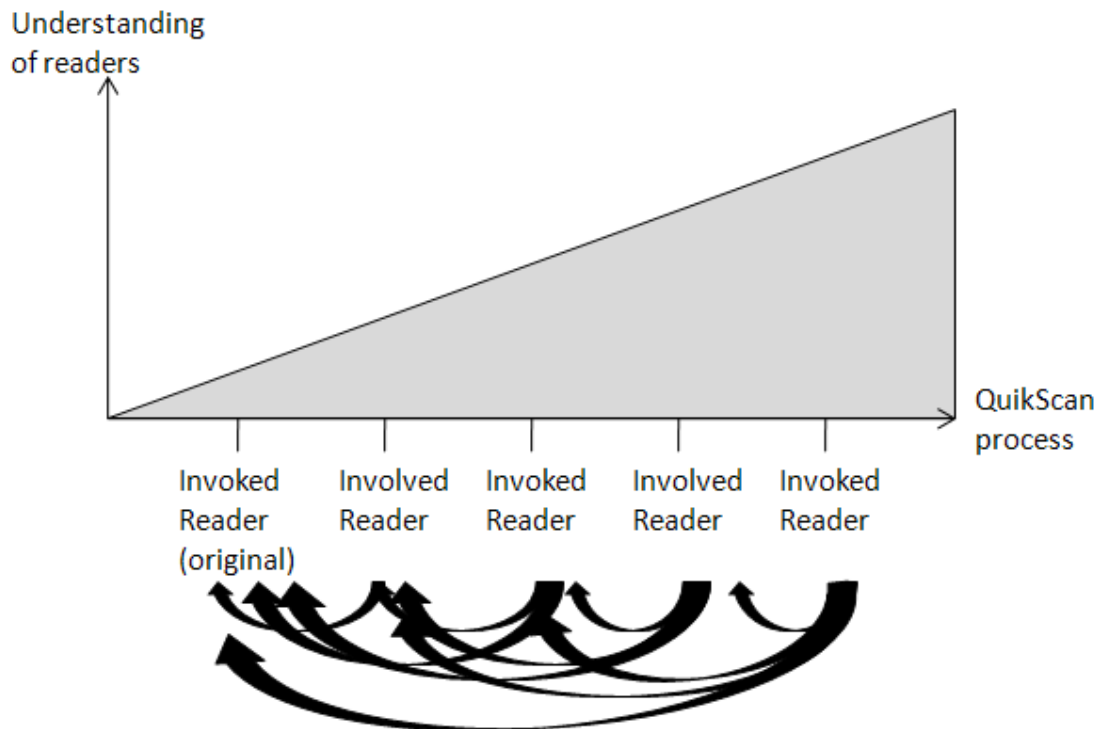
Figure 5.4 Progression of reader inquiry. The understanding of readers enriches as the interactions with invoked and real readers accumulate

Another possible scenario is that there may be more than one QuikScanner and more than one involved reader. When one or more QuikScanners interact with one or more involved readers, another layer of complex rhetorical and social effects comes into play. I suggest future research in this area in Chapter 8.

Because the reader is empowered, success and failure in a QuikScan process cannot be completely attributed to the QuikScanner. The reader, at least the involved reader, shares responsibility for a successful QuikScanning. This sharing of responsibility, intriguingly, is the result of the QuikScanner sharing control with the reader and not acquiring hegemony. Whether getting involved or not, the readers enters (virtually or physically) a territory they used to call foreign. The reader is no

longer a recipient or a passive user (Coney, 1992), but a participatory negotiator. The

QuikScanner, sharing some authorial power, is not merely a sender or a fictionalizing

writer (Ong, 1975), but a participatory negotiator. Both the QuikScanner and the

reader ought to be viewed as participatory figures in the QuikScan process.

Extreme Roles: Powerful, Excluded, and Enforced Reader

The status of the reader varies depending on the nature of the communication

process. There are situations in which the reader possesses administrative or political

power over the QuikScanner. There are also situations in which the reader is subject to

discipline. Let us first consider the following scenario:

> *Zhou & Associates, Inc. plans to increase the efficiency of its document*
> *use by implementing QuikScan in one of its lengthy internal documents.*
> *The manager of the project gives the task to a technical writer working*
> *at the company. Before the project begins, the manager meets with the*
> *technical writer and sets goals, requirements, and the timeline. During*
> *the QuikScan process, they meet every week to check the documents*
> *and adjust the QuikScanning.*

In this case, the manager is not only a typically empowered QuikScan reader, but also

a reader who has administrative authority. Since QuikScan is likely to be a business

process, very often the QuikScan will need to deal with the organizational chain of

command and political ramifications. She has to manage her relationship with senior

management and other stakeholders.

Let us consider another scenario:

> *A military manual has been QuikScanned for the army soldiers in the*
> *field. However, the QuikScanner failed to emphasize certain details*
> *that are vital to their operations. Moreover, she did not use Floating*
> *Summaries when a section exceeds two pages. The soldiers question its*
> *usefulness and find it hard to read.*

The soldiers in this scenario become excluded readers. When explaining the excluded

reader, Goodwin (1991) notes, "Pushed hard enough, audience resistance gives way to

hostility: the reader closes the manual, despises the writer, [and] forgets the product"

(p. 102). But the soldiers may not be allowed to simply forget the manual. They have

to read it as part of their duties, which makes them enforced readers. Such compulsion,

however, is due to the nature of the military rather than QuikScan. Yet in a field like

the military where discipline is seen highly important, the very motivation of

QuikScanning the manual is, undeniably, reader-centered.

In this section, I have applied pertinent reader-response theories to examine the

QuikScan reader and pointed out their shortcomings. A new framework needs to be

constructed in order to encompass the dynamics of the QuikScan process. I have

demonstrated some elements of this framework by showing my multi-faceted view of

the QuikScan reader. Such a multi-faceted view encompasses all three major views of

audience (addressed, invoked, and involved) and the dynamic relationships among

them. During this analysis, I have also described a number of QuikScanning scenarios

and indicated their participatory nature. Next, I go deeper into analyzing of the

dynamic relationships between the augmenter and the reader. I use this analysis as a

vehicle to demonstrate a broader context of information design techniques that act as

an intermediary in the author-reader dialog. Such analysis nurtures a new approach to

understanding author-reader relationships.

5.3   Understanding Augmenter-Reader Relationships

The debate on author-reader relationships, particularly on reader-response, has

cooled its temperature in the recent decade. Admittedly, there have been attempts to connect this debate with the study of new trends in technical communication. Coney and Steehouder (2000) apply the concept of the real and the rhetorical audience in designing and evaluating personas online. But their aim is not to add anything new to our understanding of author-reader relationships but to use existing theories to create practical Web design guidelines. Like Coney and Steehouder (2000), Dayton (2003) examines personas through the lens of reader-response criticism. Dayton (2003) points out that personas and scenarios encompass all three views of audience (addressed, invoked, and involved). Nevertheless, his work is centered on the value of storytelling through personas and scenarios. The implications of understanding author-reader relationships are only touched upon.

My analysis of QuikScan indicates that conventional theories regarding author-reader relationships are not perfect frameworks to explain QuikScan. In this section, I seek new frameworks to enrich such understanding. QuikScan is an example of a newly emergent formatting technique that resides in between the author and the reader. It augments the original document and enacts a discourse distinguishable from that of the original document. I call such augmentation a type of "document intermediary."

5.3.1 Augmenter as Document Intermediary

Many scholars today would certainly resist seeing author-reader relationship as one between a sender and a recipient since such a view suggests a static image of their relationship and honors the hegemony of the author. Instead, most scholars posit the

existence of an invoked reader, and in some cases, an involved reader. Thus, in order

to produce a successful document, the author has to make the actual reader be willing

to assume the invoked reader role. Although researchers have tried to adapt this view

in technical communication practice (Coney & Steehouder, 2000; Dayton, 2003), their

attempts resides in a simple author-reader framework. I say it's simple because the

discourse is grounded in a single document whose original authorship and post-author

editing cannot be distinguished. The relationships, although dynamic, involve only the

real author, the implied author, the invoked reader, and the real reader.

Augmenter Intermediary: Blended V.S. Parallel Discourse

The QuikScan discourse is complex in that an augmenter—the

QuikScanner—joins the author-reader conversation. She is not like an editor who

polishes the author's work for the sake of improving the document. She is not like a

translator who translates the meaning from one language to another for the sake of

making the same document understandable. She is not like a censor who eliminates

information on behalf of a powerful authority such as the military during wartime or

an oppressive political regime. In each of the three examples shown here (editor,

translator, and censor), there is an intermediary who mediates the author-reader

discourse. The resulting document, be it edited, translated or censored, is the blending

of the original author's messages and the message or at least the influences of the

intermediary. Such a blending, interestingly, is generally invisible to the audience. For

instance, when we read a book, we almost always assume that it has been edited. At

times editors are acknowledged, for example in the acknowledgements page or preface

of a book. But we are usually not interested in the detail of the editing. Likewise, when we read a translated book, we understand that it has been translated; we even understand that the translation may not be perfect, but we accept such a blended discourse and assume the translation is at least serviceable. When we read a newspaper in a nation in which the press is censored, we may or may not know that censorship has been performed. Even if we speculate the possibility of censorship, we can't see the censored part. Thus, the blending of discourses is, again, invisible. Since we can hardly feel the existence of these intermediaries, we can hardly recognize their implied voice (although it does exist). This blended discourse is shown in the left part of Figure 5.5.

In contrast, when we read a QuikScanned document we can clearly and easily distinguish the QuikScanner's work and that of the original author. Very often, we may even skip the main body of text and just read the summaries and highlighted parts. We understand that there are two discourses presented on paper, that of the original author and that of the QuikScanner. In other words, the discourse expressed through summaries and highlighting is visibly parallel to the original discourse. It does not blend, but augments. This means that the reader of a QuikScanned document, if needed, can attend to both the original author and the QuikScanner. The author-reader relationship in this case is not based on the author and the reader and their implied roles, but the co-presence of the author, the augmenter, and the reader (right part of Figure 5.5).
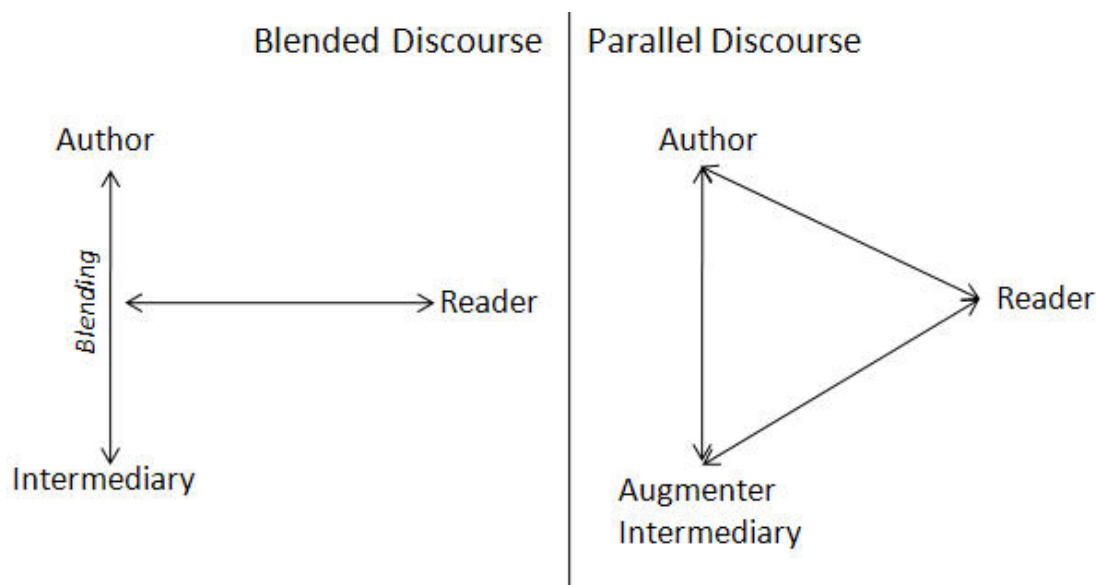
Figure 5.5 Author-reader relationships in normal intermediary and augmenting intermediary

The QuikScanner semiautonomously creates a semi-independent document whose original phrasing isn't edited, whose language isn't translated, and whose content isn't censored. Her work is discoverable and powerful—though highly constrained. Her visibility is a reason why she shares power with the original author and contributes meaning to the QuikScanned document.

5.3.2 Augmenter Intermediary: Relationships and Sub-Relationships

As I have explained earlier, the complexity of the QuikScan process can be seen through the multi-faceted roles of the QuikScanner and the reader. I have demonstrated how these roles interact. This section takes a further step by framing their relationships and investigating the interactions among these relationships. By doing so, I seek to illustrate the relationships involved in similar augmenter intermediaries, which may not be QuikScan-specific.

If we call the dialog among the author, the augmenter, and the reader "relationships," as I did in the preceding section, then let us call the interactions among the augmenter, the addressed reader, the invoked reader (augmenter's invoked reader), and the involved reader "sub-relationships." These sub-relationships are embedded between the addressed reader and the invoked reader, the augmenter and the involved reader, the involved reader and the invoked reader, and among multiple involved readers.

In the **Addressed reader—invoked reader relationship**, the reader doesn't get involved in the production of QuikScanned documents but interacts with the invoked role by the QuikScanner during reading.

In the **Augmenter—involved reader relationship,** the QuikScanner interacts with the involved reader and learn about their interests and needs.

In the **Involved reader—invoked reader relationship,** the reader gets involved in the production of QuikScanned documents, once or iteratively. He or she reads an evolving QuikScanned document and interacts with the evolving invoked reader.

In the **Involved reader—involved reader relationship**, more than one reader gets involved in the development of QuikScanned documents. Although this relationship lies completely outside the text, its vitality lies in the fact that the interactions among involved readers have an impact on how these readers interact with the QuikScanner and the evolving invoked reader. By considering the implications of this relationship, I seek to extend Johnson's (1997) "audience involved" concept.

Augmenter Intermediary: Interactions among Sub-Relationships

The sub-relationships identified here do not operate in an isolated fashion. Let us consider the following example. Prior to the QuikScanning, the QuikScanner invites a reader to get involved in order to set the right direction for the project. At this phase, the augmenter-involved reader relationship is activated. A month later, the QuikScanner brings the reader back to assess her draft. The reader is asked to read the evolving QuikScanned document and offer comments and suggestions. The reader determines that the summaries rather long and too technical, and thus finds the invoked reader role to be uncomfortable. At this time, the involved reader-invoked reader relationship is activated. The QuikScanner then adjusts the summaries. A week later, she invites multiple readers to have a focus group. The readers interact with the QuikScanner and chat with one another. Consequently, the involved reader-involved reader relationship is now activated. This is a scenario in which multiple sub-relationships coexist.

However, the sub-relationships do not merely statically coexist. They have mutual impact on one another. By interacting with the invoked reader, the involved reader can detect problems and inform the QuikScanner. By interacting with the involved reader, the QuikScanner can realize problems of the invoked reader and adjust its evolution. The communications among the QuikScanner and the involved readers are platforms in which the invoked reader evolves and the documents get improved.

To fully appreciate the rhetorical complexities of QuikScan, current literary

theories on author-reader relationships seem to be insufficient. Further attempts need to be made to accommodate these relationships, sub-relationships, and their interactions into our understanding of author-reader dialog.

5.4 Beyond Audience Involved: Toward a Dynamic View of Author-Reader Relationships

In the preceding three sections, 5.1, 5.2, and 5.3, I have analyzed the roles of the QuikScanner as reader and augmenter, the many roles of the QuikScan reader, and the relationships and interactions involved in the augmenter-reader relationship. Through this analysis, I have demonstrated the dynamic and participatory nature of the QuikScan process. This analysis, however, does not simply explain QuikScan in ways existing theories aren't able to, but also sheds some light on all author-reader relationships. In this section, I come out of the augmenter-reader box, put the augmenter aside, and focus on the implications of my analysis on our understanding of author-reader relationships. I believe that the scope of author-reader relationships should be dynamic and expand beyond "audience involved." To do so, I first highlight my core ideas that form the basis for this dynamic view.

First, I believe our view of audience should encompass all three existing views: audience addressed, audience invoked, and audience involved. Second, we ought not to view them as three different entities independent from one another. We should rather see the possibility of all three in the same discourse (in the case of QuikScan, the production of QuikScanned documents). We should not simply add the term "audience involved" to existing taxonomy, but rather understand the dynamic

relationships and interactions involved in a discourse constituted by the author, the addressed audience, the invoked audience, and the involved audience. Therefore, my new approach on author-reader relationships has the following two components: *encompassing audience types* and *understanding the dynamic relationships*. This new approach stems from the situation in which the audience is involved. It is centered on the evolution of the invoked reader and all the interactions occurring in the middle.

5.4.1 The Evolution of the Invoked Audience

Simply put, the shaping of the invoked reader is not a fictionalizing process. It is influenced by the author, the involved reader, and most importantly, their interactions. As Figure 5.5 shows, during the process of writing a document in which the audience is involved, the invoked audience constantly changes. The author may have invoked the audience before she interacts with any involved audience. The first time the audience gets involved, such interaction starts the evolution of the invoked audience. When the audience is involved again, it interacts with the previously invoked audience and the author, constituting the next version of the invoked audience. The evolution of the invoked audience, consequently, is constituted by the ongoing interactions between the author and the involved audience and the interaction between the involved audience and the evolving invoked audience. In Figure 5.6, solid lines with two-way arrows suggest interactions. Dotted lines with one-way arrows suggest the author's invoking.
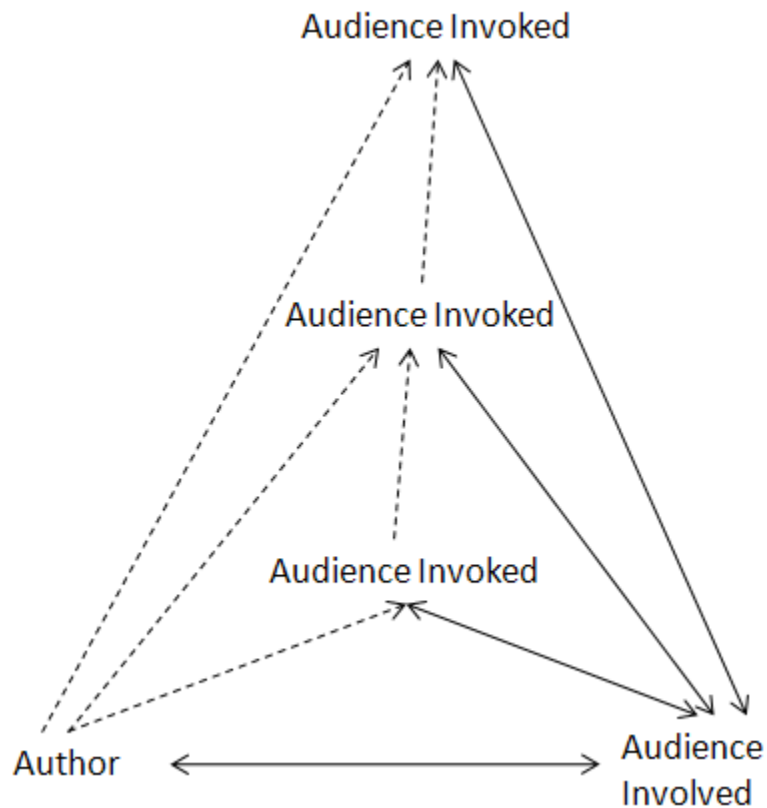
Figure 5.6 Evolution of the invoked audience

In this chapter, I have approached the rhetorical aspects of QuikScan in two ways. First, I drew upon reader response theories and analyzed QuikScan's rhetorical process. This analysis demonstrated the need to take these theories further to accommodate the complexities of QuikScan. Therefore, I devoted much attention articulating the multi-faceted roles of the QuikScanner and the reader. I framed QuikScan as a document intermediary and discussed augmenter-reader relationships. Finally, I offered my own dynamic view of author-reader relationships.

In her article *Technical Readers and Their Rhetorical Roles*, Coney (1992) generalized the common roles assumed by the reader in technical discourse. She predicted that as new technology emerges, the roles of the reader would continue to

diversify:

> [T]he roles readers play in documents, even technical documents—and the philosophic views that inform them—are not limited to the ones I've described in this paper. This is just a start, and probably there will be no finish; that is, it is likely that we will see an even greater variety of roles develop (or at least reveal themselves) as new technology with its attendant documentation and social consequences develops. (p. 61)

This "greater variety" has been realized in QuikScan. I predict that as QuikScan is used in various professional discourses, the roles of the QuikScanner and the reader, and the relationships and interactions will vary. The next chapter describes a number of special discourses where QuikScan provides significant advantages.

Chapter 6: Special Applications of QuikScan

In the preceding chapters, I have reviewed relevant literature, demonstrated the design of QuikScan, investigated the effects of QuikScan on reading, and explained QuikScan's rhetorical implications. During this discussion, I focused on the primary use of QuikScan: to facilitate reading comprehension and information seeking when a document is being read privately by an individual reader. I did briefly touch on possible applications of QuikScan in other contexts of document use such as information processing in business meetings and reading with vision loss. I will now discuss these other contexts and special circumstances in which QuikScan can be especially useful.

First, I explore the significant advantage QuikScan can offer to business meetings. To do so, I discuss the importance of documents in meeting decision-making in general, and then demonstrate where QuikScan can be especially valuable. In this discussion, an imaginary transcript of a fictionalized meeting is provided to articulate my arguments. Second, I explain the effectiveness of QuikScan in helping visually impaired readers digest and search for information on-screen. This discussion draws upon a consulting study in which a blind student used QuikScanned materials and offered comments and suggestions. Third, I demonstrate QuikScan's potential application on RSS (Really Simple Syndication) feeds. I illustrate a sample QuikScan-enhanced feed and explain the mechanism for generating QuikScan-enhanced feeds.

6.1 Using QuikScan in Business Meetings

In government agencies, corporations, and non-profit organizations, a large amount of information is processed collaboratively, often in business meetings. On the one hand, professionals in the workplace are often overwhelmed by an enormous information overload (Davenport, 1997). On the other hand, the quality of information must be ensured for it has a significant impact on the productivity of business decision-making (Volkema & Niederman, 1995; Emanuel, 1996; Huber, 2003). Well-organized use of information can enhance the quality of decision-making, increase the efficiency of meetings, and even reduce the frequency of time-consuming meetings (Huber, 2003). However, meeting attendees are often poorly prepared (Romano & Nunamaker, 2001; Emanuel, 1996). Business executives walk into a meeting with an inadequate knowledge of the documents to be used (Emanuel, 1996). Such meetings are not likely to be productive. QuikScan can be used to facilitate meeting discussion by increasing the information accessibility of documents. In this section, I first discuss relevant literature on the use of documents and summaries in organizational settings, particularly meetings, and later demonstrate the use of QuikScan in business meetings[16].

Researchers have studied means to improve document quality for meetings. Davenport (1997) points out that corporations have used librarians, editors, and other staff to effectively scan and synthesize information for senior management. He further

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[16] I use "business meetings" to designate a broad range of small-group meetings in which deliberation and decision-making take place (Zhou & Farkas, 2006).

notes that effective scanning should not merely be performed by automatic machines but by human analysis. Being able to determine, from a jungle of information, what is needed and important and what is not is a key to the success of business operations (Davenport, 1997). Tichy (1966) identifies summarizing as a critical skill for writers in the industry. Emanuel (1996) studies the executive summary and stresses its importance in the following way:

> Presenting the correct written information to a business decision maker in the appropriate form is often critical to the success of the project. A lengthy report is not likely to be read, while a project abstract with insufficient information may not allow the decision maker to act. In these cases, the executive summary may be the writer's only opportunity to convince the decision-maker to act. (p. 78)

Some researchers suggest that an executive summary, in a business environment, should be in a specific sequence. For instance, Emanuel (1996) points out that business executives read facts, conclusions, and recommendations, and then make decisions. "To make a good decision the reader must not only understand the individual components, but must also the relationships and the logic involved in reaching a particular recommendation." (Emanuel, 1996, p. 79) For this reason, Emanuel proposes a sequence of topics in an executive summary: problem definition, summary of factual information, conclusions, recommendations, cost-benefit analysis (p. 79). Like Emanuel, Burnett (1994) specifies the structure of the executive summary in the order of topic and impact, recommendation, methodology, results, and conclusion. Hartley and Betts (2007) examine structured abstracts through four empirical studies. A structured abstract, similar to the executive summary, presents

information in categories (e.g. background, aim, method, results) rather than using plain text in a paragraph format (Hartley & Betts, 2007). Hartley and Betts (2007) suggest that compared to traditional abstracts (unstructured plain text), structured abstracts contain more information and are easier to read and search. Hartley and Betts (2007) reveal that readers viewed structured abstracts more positively than traditional abstracts.

QuikScan resembles structured executive summaries and structured abstracts in that it synthesizes the superordinate ideas or target information succinctly. Nevertheless, QuikScan differs from them mainly in the following ways: 1) QuikScan does not require radical changes to a document's structure and thus is more implementable in the business setting from the perspective of cost and time; 2) Because QuikScan summarizes the superordinate ideas of each section, important ideas can be quickly identified at a local level rather than global; 3) with the help of numbered or lettered list items, attendees can rapidly locate content items, again, locally within each summarized section.

Although the implications of such differences apply to individual reading, they are especially prominent when QuikScan is used in meetings. When attendees are poorly prepared for a meeting—that is when they haven't adequately read the documents being discussed—they are likely to have difficulties in leading the meeting or following the discussion. As meeting attendees move from one topic to another, they will flip pages back and forth, skim and scan for targeted information. In this situation, QuikScan functions as "road signs" that direct attendees to make discussion

transitions smoothly. When a meeting runs into a debate over a lengthy document, the benefits of QuikScan can be particularly prominent. Since executives are unlikely to have read a lengthy document for a meeting (Emanuel, 1996), QuikScan can enable poorly prepared attendees to focus their attention on key ideas, to avoid the burden of jumping back and forth in a document, and to quickly catch up with the on-going discussion.

To illustrate how QuikScan makes meetings more efficient, an imaginary transcript of a fictionalized meeting is provided below. In this scenario, three attendees (faculty) from a university's graduate school Arthur, Beatrice, Carmen, and Roger (the dean) met together to nominate a professor for a mentorship award. Their task is to evaluate the qualifications of Professors D and E and pick a finalist. Each professor is represented by a 5-page supporting material formatted in QuikScan. The supporting material includes student opinions about each professor. While Beatrice, Carmen, and Roger had read the material once, Arthur has only glanced at them briefly. He was poorly prepared for this meeting. Arthur, therefore, makes extensive use of the QuikScan components during the meeting, but other attendees also benefited from QuikScan.

> **Roger:** *Now let's look at D's guidance on graduate students.*
>
> **Carmen:** *I think he is really an outstanding mentor. This student says D spends lots of extra time providing comments and suggestions on her dissertation. D helped her refine the study methodology and pointed out a potential issue that could invalidate her findings.*
>
> **Beatrice:** *Yes. Not only that. D even spent weekends with her going through her research plans.*

Arthur: *Which part are you referring to?* [Feeling lost due to his unfamiliarity with the material]

Beatrice: *Ah... Page 3. We are talking about the items in the summary.*

Arthur: *Oh, yes, thanks!*

Carmen: *Then she goes on saying that without D she would not have been granted the opportunity to teach. Page 4.*

Arthur: *Look at list item 3 on page 4. She says Professor D recommended her for this teaching position.* [Looking for the location in the main text where item 3 is explained] *Here, on Page 5, she explains that Professor D helped her revise resume and teaching plans when she was applying for the job. He also gave her valuable suggestions on motivating undergraduate students and making a technical course intriguing.*

Roger: *True. But Professor E also provided similar support to his student. What makes D or E unique?*

Carmen: *If you read E's material, one student talked about E's personal support.* [Looking for the summary with this information]. *Here we go, the student said E invited him to Thanksgiving dinner every year. The first summary on Page 3.*

Arthur: [Switching from D's material to E's material]

Beatrice: *I saw that as well. This is a foreign student. E helped him improve his English a lot.*

Arthur: [Found the summary items about E helping the student improve English; at the same time, Arthur noticed another important item in the summary] *Because the student had difficulties in finding funding, E actively searched for research grants for him.*

Roger: *Yes! We have a competitive pool of candidates this year.*
…………………………………………………………………………….

This scenario shows how the poorly prepared Arthur was able to overcome

feeling lost, join the conversation flow, and actively participate and later drive the

discussion. Arthur was able to take advantage of the summaries, particularly the

numbered items and the target numbers, and capture superordinate information. He

was able to catch up when the meeting switched topics. Additionally, this fictionalized

meeting depicts a scenario in which multiple documents are used. Comprehending

multiple documents coherently is a challenging process in which a reader has to

maintain active link between documents, particularly the source and the content of

each documents (Rouet, 2006). "In other words, the reader has to remember both what

was said and who said it." (Rouet, 2006, p. 92). By summarizing the superordinate

ideas of a document and providing accessibility through numbering and lettering,

QuikScan makes it easy for readers to compare and switch among documents and

reduces interruptions in the flow of discussion.

     I envision QuikScan becoming widely used in organizations, corporations,

educational institutions, and government agencies. Meetings are among the places

where QuikScan can be especially desirable. Because executive-level meetings are of

high consequence, using Quikscan to enhance meeting productivity offers high value

to organizations. QuikScan can become a professional communication career path and

can be performed both in-house and by contractors. I have designed QuikScan so that

a technical writer or editor, after one day training and practice, can become an

entry-level QuikScanner. Since it is very likely that the clients of QuikScan documents

will require a short turn-around time, QuikScanning should be planned carefully in

advance. This planning includes assigning QuikScanners, laying out a timeline,

analyzing reader needs, identifying QuikScanning priorities, and distributing

QuikScanning work among different QuikScanners. The QuikScanner should consult with clients on their special needs and expectations, and sometimes she may need to negotiate on making the best of QuikScan.

In addition to training QuikScanners, meeting attendees need to be familiar with the QuikScan format in order to effectively use it for their benefit. In Chapter 7, "Implementation of QuikScan," I include the material for reader training. In my empirical studies and pilot tests, all readers were able to satisfactorily complete reading training within two minutes.

6.2   Using QuikScan to Help Visually Impaired Readers

Whereas blind people once relied heavily on braille and audiotapes, today's technology has enabled visually impaired readers to read the same documents read by individuals with normal vision. Text-to-speech software, or the "screen reader," is an effective and widely used tool to help visually impaired individuals read text by having the text vocalized for them. These software programs can vocalize documents of many kinds including Microsoft Word and HTML pages. Widely used programs include JAWS, NaturalReader, ZoomText, and TextAloud.

One challenge encountered by visually impaired readers is that text-to-speech software reads a document in a linear and non-selective way (Juvina & van Oostendorp, 2006). Visually impaired readers, therefore, have to listen to the document being read sequentially and may waste much time on irrelevant and redundant information (Juvina & van Oostendorp, 2006). Juvina and van Oostendorp note: "This slows down the process and adds information load that much be handled

with users' limited cognitive resources" (p. 71). In addition, it also makes it highly

difficult for visually impaired readers to locate goal-relevant information (Jones, Farris,

Elgin, Anders, & Johnson, 2002; Juvina & van Oostendorp, 2006). Even when a

document has an executive summary at the very beginning, the summary does not

provide specific overviews to each local section and certainly does not enable visually

impaired readers to search for specific details. In fact, not all summaries closely map

the structure of the summarized text. Remembering what the executive summary says,

amid a lengthy document, requires extensive use of cognitive resources.   Accurately

remembering the executive summary still does little in aiding information search.

Juvina and van Oostendorp (2006) point out that text-to-speech software needs to have

"intelligence" to help visually impaired readers search for goal-relevant information.

> Sighted persons have size, colors, position, shape, motion etc. as aids to
> discriminate between various types of information. Screen readers have
> only phonetic cues (e.g. male vs. female voice) and verbal cues (e.g. the
> word 'link' is added after each link). Moreover, there is no support in
> discriminating goal-relevant information from 'noise.' Information is
> presented serially and not in parallel as in visual interfaces. Visual and
> contextual cues are either absent since they cannot be translated in a
> textual form or difficult to retrieve because re-visitation is non-selective.
> Selective reading as an alternative to exhaustive reading would be a
> natural solution. This requires adding 'intelligence' to screen readers.
> An intelligent agent could be working together with the screen reader
> prompting the user with goal-relevant selections. (Juvina & van
> Oostendorp, 2006, p. 72)

QuikScan may not be exactly the same kind of "intelligence" in the minds of

Juvina and van Oostendorp. But its potential in assisting visually impaired readers is

significant. QuikScan can enable visually impaired readers to quickly grasp the gist of

a document, read (listen) selectively, and search for specific content items.

The successful results obtained from the two empirical studies in reading comprehension and information seeking with normal, sighted readers (See Chapter 4) prompted me to investigate the effects of QuikScan on visually impaired readers. In this section, I first describe the use of QuikScan by blind readers who don't have any vision. To illustrate such use in a concrete situation, I present the findings from a blind student who read a QuikScanned document on the computer with the help of text-to-speech software. I then briefly describe the benefits of QuikScan for visually impaired readers who have a certain level of vision.

6.2.1 The Use of QuikScan by Blind Readers

Computer readers who are completely blind solely rely on text-to-speech software vocalizing texts for them. To investigate how these readers use QuikScan, I visited a blind individual, Zach, a University of Washington undergraduate who was employed as a consultant at the Access Technology Laboratory (ATL)[17] at the University of Washington on February 15th, 2007. Zach worked with me in the capacity of a salaried consultant rather than as a research subject. Through this consultation, I intended to investigate the following questions:

1. Can a blind reader differentiate QuikScan elements from the main body of text?

2. Can a blind reader read selectively and skip sections in a QuikScanned document?

3. Can a blind reader search for content items in a QuikScanned document?

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[17] http://www.washington.edu/computing/atl/

4. Will a blind reader find QuikScan useful?

Using JAWS on a computer, Zach first read a QuikScanned document (Microsoft Word) for approximately 15 minutes and then read a HTML version of the same document. In Word, he was able to quickly understand the function of QuikScan summaries and differentiate these summaries from the rest of the document. When encountering a Boxed Summary, JAWS reads: "table [number], uniform table, column one of one, row one of one, one brace." Blind readers are immediately informed that they are listening to a summary. I was greatly gratified to observe that Zach, using the Boxed Summaries in conjunction with Word's Find feature, was able to quickly jump to the sections of the text he was interested in. On the HTML version, he successfully used the hyperlinked summary items to locate particular content items in the main body of text. He noted that the numbers in the summaries helped him search for the same numbers in the main body of text to get a full description of the summarized items. Table 6.1 shows Zach's comments and suggestions.

Zach's experience reveals the great potential of using QuikScan to help visually impaired readers. If QuikScan can be very valuable for textbook readers in general, as one participant in the empirical studies mentioned, then it can be even more valuable for visually impaired students who read textbooks on the computer. In Chapter 8, I suggest some ideas to further study the effectiveness of QuikScan in helping visually impaired readers.

Table 6.1 Quotes from Zach[18]

Comments	Suggestions
"This is really cool."	*"I expected it to be in two different files. There is no trouble in opening up two files."*
[Talking about HTML] "I like the curly brackets here, just for consistency."	*"Make* [No.] *4 a link back up to the summary."* [Talking about the HTML]
"Oh, that's cool, it worked." [Speaking about the jumping between the summary and main text in HTML]	*"If the numbers getting big, I don't mind. I would prefer that rather than being ambiguous."* [Commenting on the reuse of the same numbers in the summaries]
"I would definitely use it. It's extremely valuable."	[Instead of using "}}" all the time, maybe use "{{1" in the summary, and "1}}" in the document. This is especially helpful for blind people. "}}" could be troublesome if it confuses with the same symbols in the document.]
"I like to have summaries to keep a global perspective."	
"The coolest thing is it creates a link between what's going on locally and what's going on globally."	[Normal average screen reader doesn't read color, or at least not obviously available. But JAWS does read underlining.]
"I could implement the system myself."	
"JAWS loves to read heading structure. The more hierarchical, the better."	[Regarding highlighting, JAWS reads "black on yellow" to distinguish from "black on white." However, there is no way to search for the highlighted part. The reader has to know where the highlighting is in order to read it.]
"Extremely valuable for math texts with 10 pages of theorems."	

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[18] Quoted with permission; italicized information refers to direct quotations while the information in braces explains Zach's words or paraphrases Zach's meaning.

6.2.2 The Use of QuikScan by Readers with Partial Vision[19]

QuikScan can potentially help visually impaired readers, who have some

vision, to grasp the gist of a document more effectively and search for information

more efficiently. A number of programs such as NaturalReader and ZoomText help

make information stand out visually for these readers in a variety of ways. In

NaturalReader, for example, the sentence being read is highlighted with a yellow

background (Figure 6.1). The word being read is further highlighted with a dark

background (Figure 6.1).
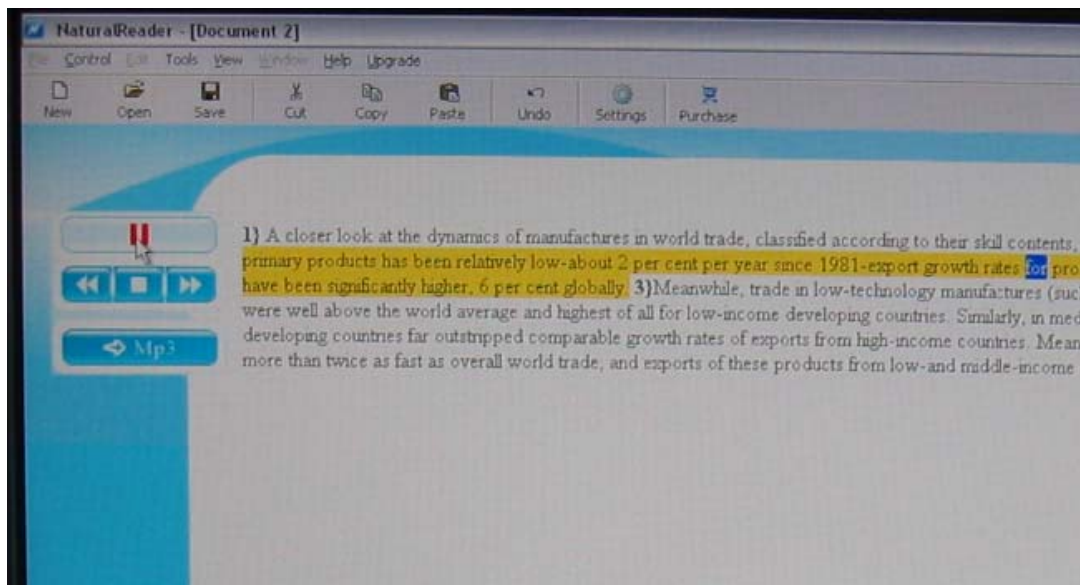
Figure 6.1 NaturalReader reading a QuikScanned paragraph

ZoomText enables readers to magnify the interface on the computer. Figure 6.2

shows a zoomed-in screen of a QuikScanned document in Word. Figure 6.3 shows a

further magnified version. When zoomed, the QuikScan summaries, numbers, target

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[19] For the figures used in this section, pictures instead of screenshots are used. First, capturing
screenshots was not feasible at the workstation. Second, because pictures show the computer monitor
screen, it helps indicate the size of the zoomed-in interfaces.

numbers, and color can potentially help visually impaired readers who have

difficulties in distinguishing content items. Figure 6.4 shows a typical workstation for

visually impaired readers in the Access Technology Laboratory at the University of

Washington. The workstation has two keyboards: one used by regular users (left) and

one designed for visually impaired users (right). The keyboard for visually impaired

users is yellow with large bolded characters (Figure 6.5). Visually impaired readers

can use the buttons to zoom the QuikScanned document on the computer screen.

QuikScan, therefore, holds great value both for completely blind readers who

rely entirely on audio information and for partially sighted blind people who can use

QuikScanned documents when the text has been magnified. Possibly, some blind

readers will use both methods in tandem.
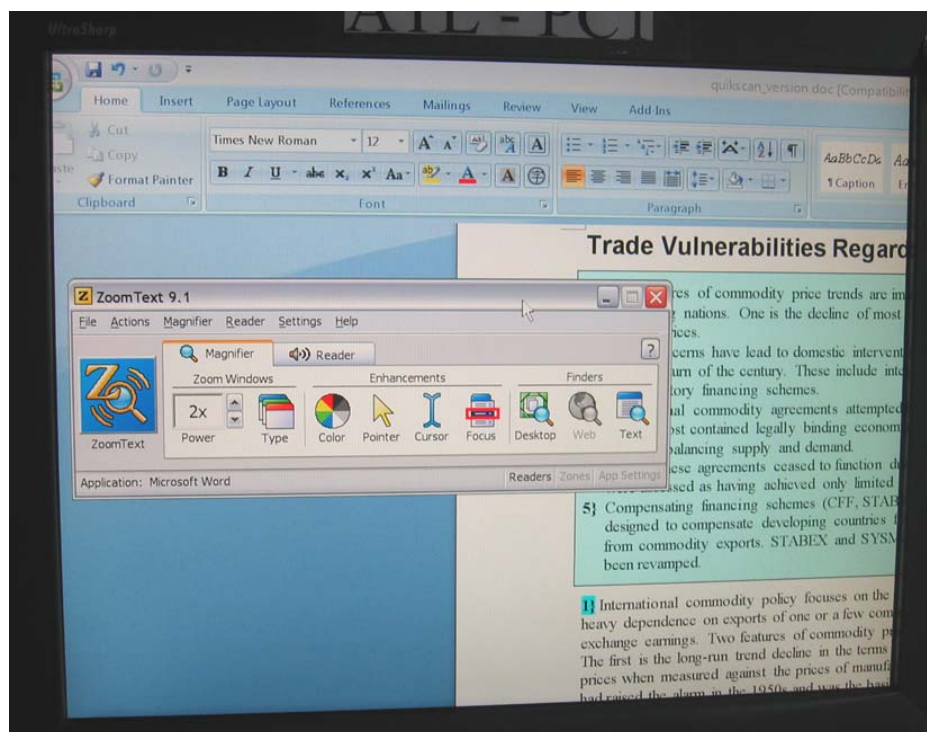
Figure 6.2 A QuikScanned document magnified by ZoomText
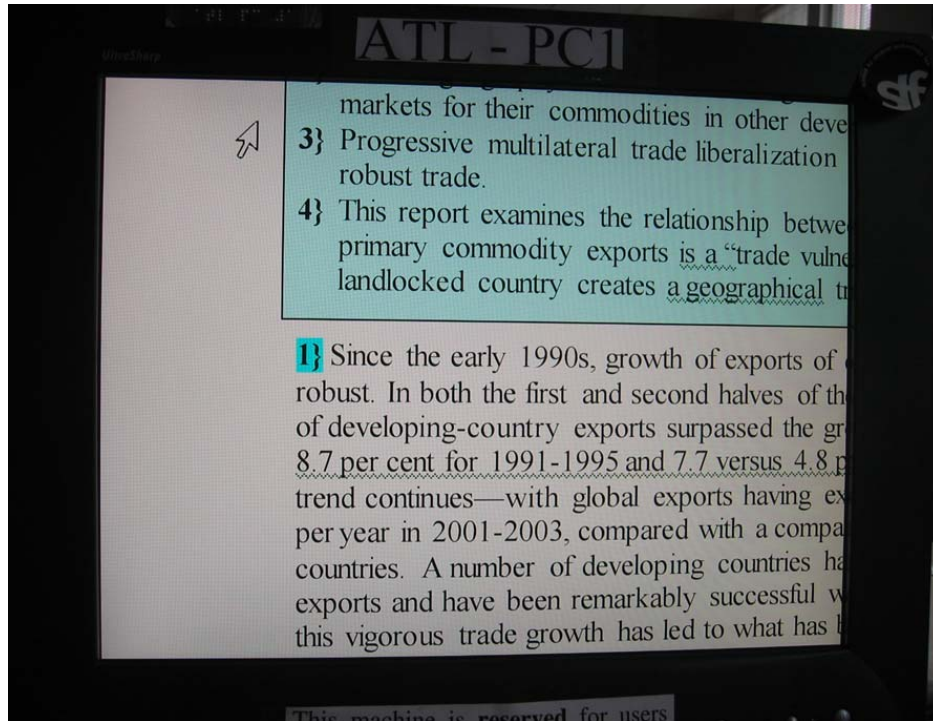
Figure 6.3 A QuikScanned document further magnified by ZoomText
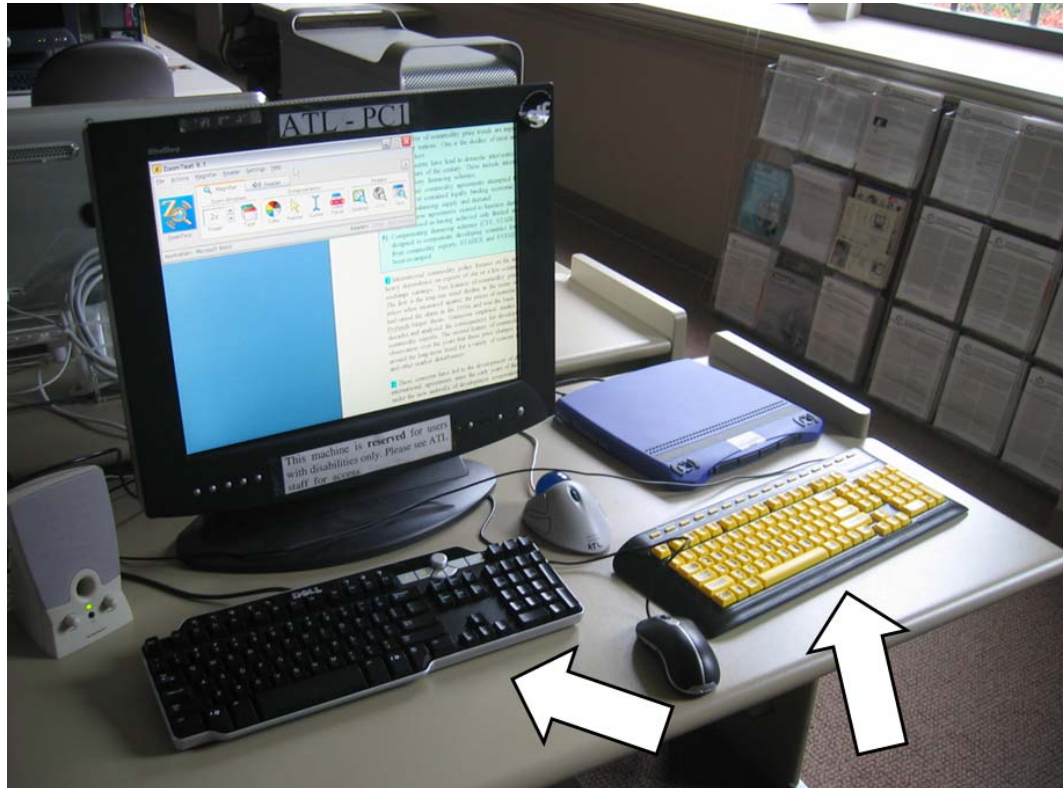
Figure 6.4 A workstation for visually impaired students

Figure 6.5 ZoomText keyboard

6.3 Applying QuikScan on Really Simple Syndication (RSS) Feeds

The Internet has become a major medium for accessing information. On the

Internet, people are inclined to read quickly and selectively (Farkas & Farkas, 2002).

Because the Web is a "non-sticky" medium, users tend to have less patience reading

and searching for information (Farkas & Farkas, 2002). Web users expect to find their

target information without having to process a large amount of less relevant

information. While in the past users went to websites to get news and information,

nowadays many of them subscribe to RSS (Really Simple Syndication) feeds to

receive customized news reports, weather forecasts, scores of sport events, and so

forth. Such feeds usually take the form of a summary that consists of the first couple

of sentences of the actual news story. By reading the feeds, users can decide whether

to pursue further for the complete story or to browse other content. Users can

subscribe to RSS feeds using any RSS aggregator (e.g., Google Reader, Mozilla

Thunderbird). Figure 6.6 shows the CNN.com U.S. news feed in Google Reader[20].

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[20] www.google.com/reader

In this example, the summary is the first sentence of the actual news story on the most recent one of a series of earthquakes in southern Illinois.
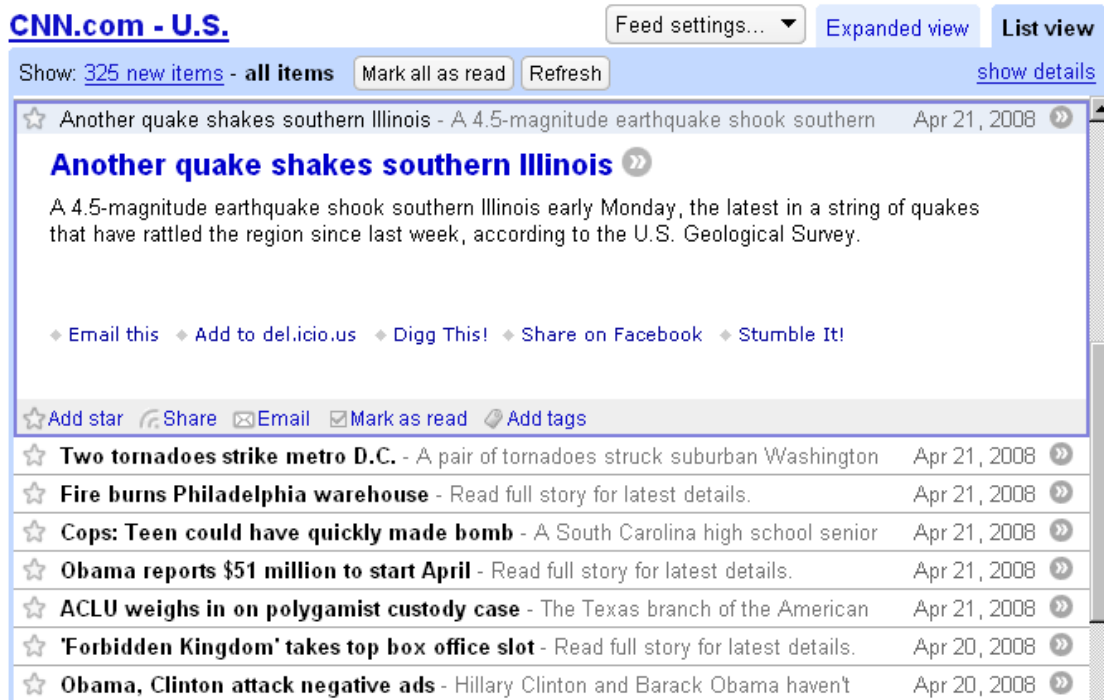
Figure 6.6 CNN.com U.S. news RSS feeds in Google Reader[21]

Because RSS feeds are mostly used for quick browsing, they should contain just essential information. Unfortunately, very often the summaries in the feeds do not provide an adequate preview of the gist of the story. QuikScan can be used to supplement such feeds. QuikScan summaries convey rich information that is much more useful than a conventional RSS feed. First, even if a conventional feed contains several sentences, they are still just the introductory sentences that might not be very revealing. In contrast, the QuikScan feed is a true summary. Second, unlike conventional feeds, each item in a QuikScan-enhanced feed can be hyperlinked with

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[21] Screen captured on April 22nd, 2008

the corresponding section of the original passage, providing accessibility at a local level. The CNN feed in Figure 6.6 is enhanced by QuikScan in Figure 6.7. From the feed in Figure 6.6, readers are only informed that an earthquake happened in southern Illinois. The QuikScan feed in Figure 6.7, however, reveals much more details about the earthquake.

The mechanism of producing and accessing QuikScan-enhanced feeds is shown in Figure 6.8. The QuikScanner first uses the RSS template in Dreamweaver to produce the summaries. Then, he or she uploads the feed. QuikScan readers then subscribe to the feed using any RSS aggregator. Through the feed, readers access the local sections of the complete passage. In short, improving RSS feeds is one more potential application of QuikScan.
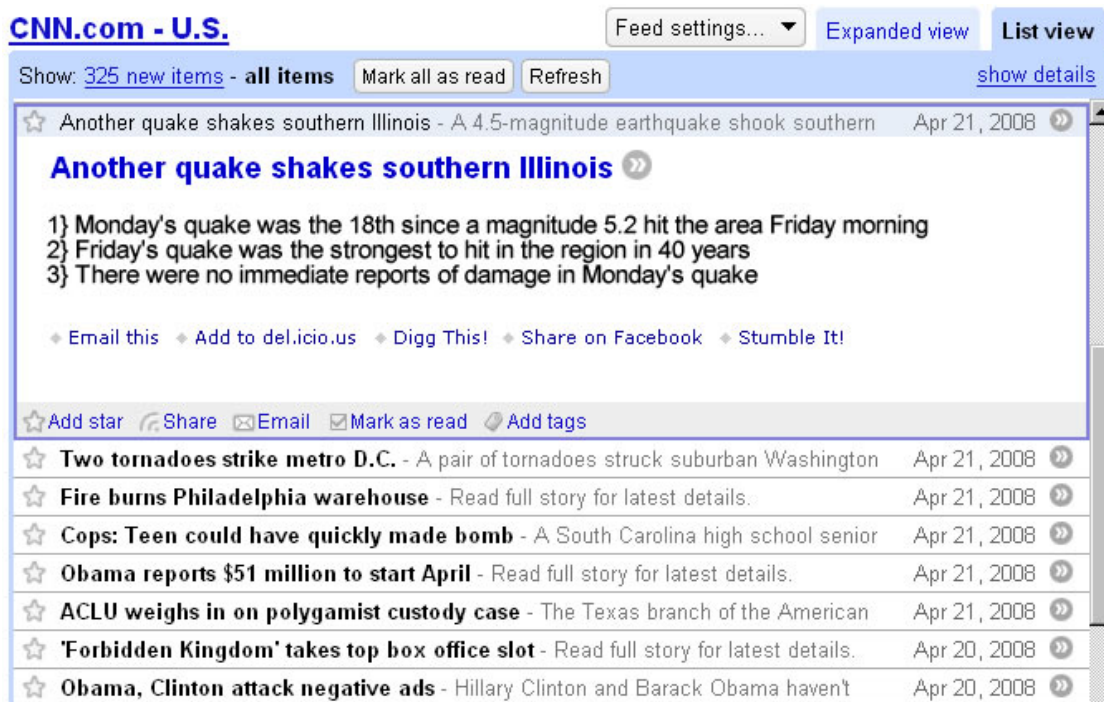
Figure 6.7 QuikScan-enhanced CNN.com U.S. news RSS feeds in Google Reader[22]

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[22] The QuikScan summary in Figure 6.7 was taken from CNN.com's "story highlights."
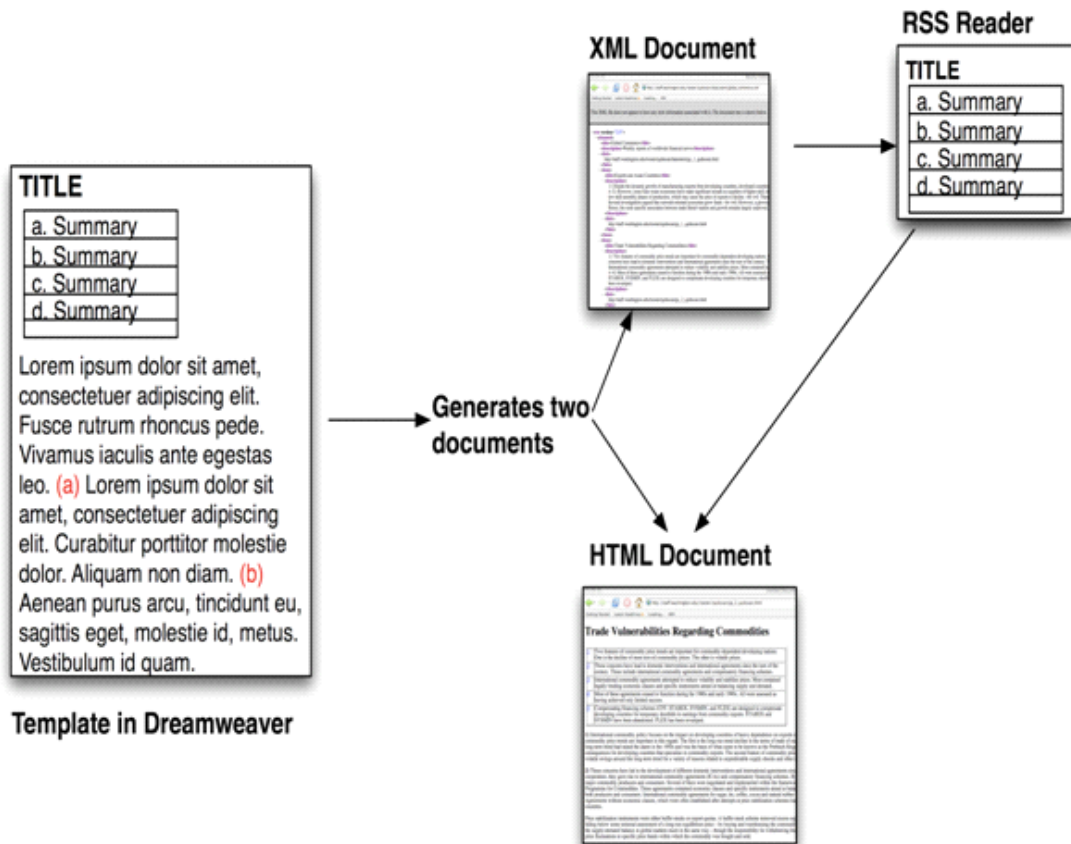
Figure 6.8 The mechanism of QuikScan-enhanced feeds[23]

In this chapter, I have demonstrated three special applications of QuikScan: supporting business meetings, assisting visually impaired readers, and improving RSS feeds. The QuikScan format appears to be robust and flexible. Therefore, I believe that more special applications may well be found.

One question arises following these analyses: How should a QuikScanner implement QuikScan to best realize its benefits? In the next chapter, I describe the successful approaches to implementing QuikScan.

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[23] Matt Carthum, a member of the QuikScan Directed Research Group, spearheaded this effort.

Chapter 7: Implementation of QuikScan

QuikScan's usefulness is not just a function of its design, but is eventually realized by the quality of the work each time a document is QuikScanned. While I have introduced the components of QuikScan, in this chapter I focus on how to make them work.

Because of the flexibility of QuikScan, we can envision QuikScanning being performed in various settings and by different kinds of individuals. Most likely QuikScan will be performed within large organizations for internal audiences. The QuikScanner may be an employee or a contractor. This individual is apt to self-identify as a professional technical communicator—very likely an editor. Another potential use is the QuikScanning of documents by large organizations for their external audiences. Likely scenarios include textbook publishers, government agencies that distribute reports, and others who are concerned about the usability of their external publications. Individuals may even choose to QuikScan a document for a community they belong to. For example, a historian might QuikScan a lengthy historical document for the benefit of his or her professional colleagues. It is also possible that individuals may QuikScan documents of importance both to make the document more usable for themselves and as a means of closely studying the document.

However, whenever, and wherever QuikScan is performed, certain guidelines are needed to ensure its quality. QuikScanning a document effectively is a challenging

task. It requires broad rhetorical skills so that the QuikScanner can understand the audiences and their needs and the stakeholders and their goals. It also requires facility with language so that the QuikScanner can write short, informative, nuanced summaries. Skillful manuscript editors typically possess these skills, and so editors are probably best positioned to become QuikScanners. In this chapter, I first explain the QuikScan process: planning, execution, and evaluation. In doing so, I provide guidelines on how to effectively implement QuikScan. For example, the QuikScanner must choose which kinds of Boxed Summaries to use, where to add them, and whether to employ the informative or descriptive style in writing each summary. Furthermore, the specific process of crafting each summary is exacting. How many list items should a particular summary consist of? How long and how specific should each list item be? The guidelines explained in this chapter are meant to help QuikScanners and their target audience. These guidelines ought to be regarded as guidelines rather than strict rules. In addition to explaining the QuikScan process and guidelines, this chapter presents materials for reader training and reveals the circumstances in which the use of QuikScan can be ineffective or inappropriate.

7.1   The QuikScan Process

A typical QuikScan process, illustrated in Figure 7.1, consists of planning, execution, and evaluation. Generally speaking, planning involves analyzing audience and goals and examining the original document. Execution involves implementing the QuikScan components: summaries and highlighting. Evaluation involves revising and editing content and conducting user testing and stakeholder reviews. In this section, I

describe each of these steps with a focus on execution, where I explain specific

guidelines for the exercise of QuikScanning.
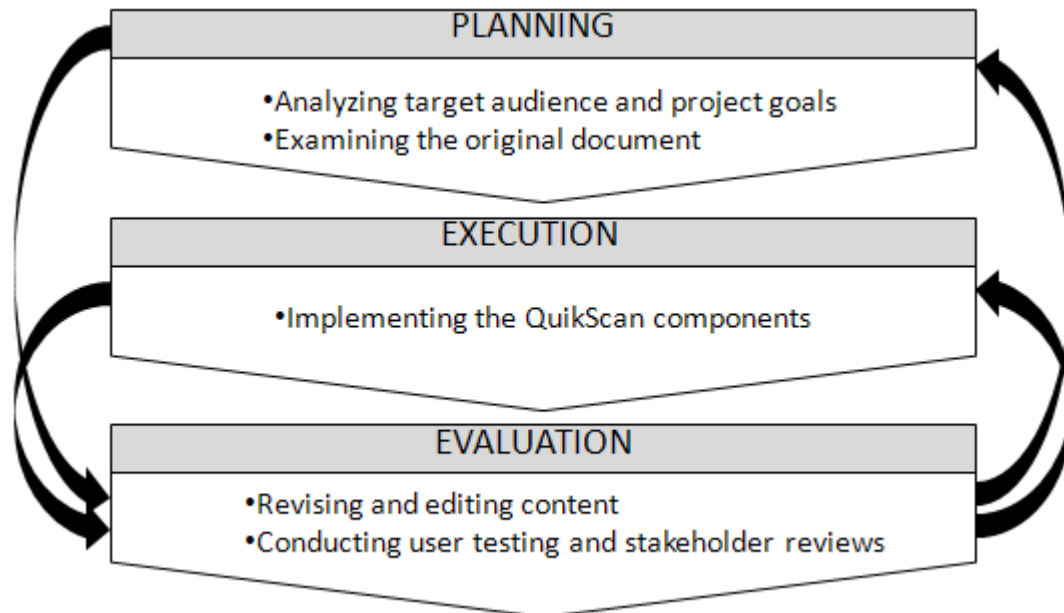
Figure 7.1 A typical QuikScan process

7.1.1 Planning

Analyzing Target Audience and Project Goals

The first step in almost any kind of technical communication is audience

analysis (Markel, 2006). While all writers analyze their readers, technical and

professional writers have a particularly strong need to fulfill specific needs of specific

audience (Markel, 2006). Keene and Barnes-Ostrander (1985) note: "Audience

analysis and adaptation are essential skills for any technical communicator. The

attitude of audience awareness is the hallmark of a professional in the field" (p. 164).

Understanding the needs of target readers is the central challenge of QuikScan.

QuikScanning is nothing like writing a novel in a lone courtyard. It is even largely

different from typical technical writing in that QuikScanning does not create content

from scratch, but rather augments and enhances an existing document. Very often, it is a part of a larger business process associated with the distribution of human and financial resources and their constraints. Therefore, a successful QuikScan process starts with consulting with stakeholders and analyzing target audiences. The QuikScanner needs to interact with upper management and major stakeholders, probe the larger business plans, understand how QuikScan fits into the bigger picture, identify priorities, and outline an appropriate work plan, including the distribution of QuikScan work, the coordination methods, budget, and timeline. When the target audience resides outside of the organization, the QuikScanner needs to balance the goals of the organization and the needs of the readers. For example, an editor at a publishing company may be asked to QuikScan a popular textbook. As an employee of the company, the QuikScanner must understand the business goals of her company. For instance, what is the purpose of providing a QuikScanned version of the textbook? Whom does the company hope to sell the version to? How much does the company allow to spend on QuikScanning and making QuikScanned copies? These questions will help plan the scope of the QuikScan project. To probe readers' needs, the QuikScanner could refer to market data showing previous successes, failures, and reader complaints. She should examine similar documents and similar discourses and set an appropriate benchmark. She should investigate the general demographics of the target readers, their knowledge and background in the document's subject area, and their purposes of using the document.

An effective way to analyze target audience is to involve readers in the

QuikScan process. The QuikScanner is likely to take a user-centered design approach

and use some of the commonly used research methods in the computer industry,

particularly usability testing. These methods are explained in the upcoming section of

"Evaluation." If more than one QuikScanner is involved, understanding target

audience and project goals ought to be a collaborative effort to ensure all

QuikScanners are on the same page.

Examining the Original Document

For the QuikScanner, examining the original document is as important as

understanding target audience. This is a primary distinction between QuikScanning

and typical technical and professional writing. While in a normal situation a technical

writer is not a reader, the QuikScanner's job is dependent on examining the original

document; she only augments the original document without altering or editing the

original document. As I have pointed out, this unique feature requires the QuikScanner

to adhere to the original document and appropriately augment it simultaneously.

First of all, examining the original document helps the QuikScanner

understand who the document is intended for. Sometimes, the original document's

intended audience may overlap with the QuikScanner's target audience. Sometimes, it

may not overlap with the QuikScanner's target audience. In most cases, however, the

QuikScanner's target audience shares certain commonalities with the intended

audience of the original document. Understanding how the two intended audiences

resemble and differ in a concrete situation provides a basis for a well-targeted,

effective QuikScan.

Second, examining the original document is the one chance for the

QuikScanner to digest the content of the original document. Misinterpreting the

original document can invalidate the whole QuikScan process, disseminate inaccurate

or false information, and cause business failures and other undesirable outcomes.

Consequently, the QuikScanner should not jump right in and start summarizing the

document the first time she goes through it. She should not only digest the general

meaning of the original document but also achieve a thorough understanding of its

purpose and structure. The main goals of examining the original document are these:

- Understanding the general purpose of the original document

  What is the theme? Why was it produced or published? When was it

  produced or published? What level of reader knowledge is it aimed at?

  Which professional field is it targeted at? These questions are not meant to

  be exhaustive, but they indicate the areas the QuikScanner should

  investigate while reading the original document.

- Understanding the structure of the original document

  How is the document organized? Does it use headings? How frequent are

  headings used? How are concepts developed (e.g., chronological, general to

  specific, superordinate to subordinate)? As I have fleshed out in Chapter 3,

  the structure of the original document largely affects where to place

  summaries, how frequently summaries should appear, and what types of

  summary text should be used.

- Understanding the gist of the original document

What does the author emphasize? What are the major arguments?

Understanding the gist of the original document is important when the

QuikScanning is more aligned with the originator community. However, it

is equally important when the QuikScanner is more influenced by the

audience community. Only if the QuikScanner thoroughly digests the

original document will she be able to confidently and effectively augment

the document.

When the topic of a document lies in a highly specialized area, possessing

subject expertise may become a prerequisite for the QuikScanner. The QuikScanner

needs to ensure that she is familiar with the subject of the document. In case of a gap

between her knowledge and the content of the document, the QuikScanner should at

least consult with experts and incorporate experts into the production of the

QuikScanned document. Possessing adequate subject- matter knowledge is both a

professional requirement and an ethical responsibility.

7.1.2 Execution: Implementing the QuikScan Components

QuikScanning a document is not at all like adding a series of headings to the

original document for the summaries are much more informational than headings. It is

not inserting an abstract at the beginning of the original document for

QuikScan summaries synthesize each local section and provide accessibility to

details at a local level. QuikScan is not editing or altering the semantic meaning of the

original document, for the summaries only augment. As a primary principle, the

QuikScanner ought to preserve the semantic meaning conveyed by the original

document and emphasize the superordinate ideas through summarizing, and spotlight important details through highlighting.

Despite QuikScan's goals to be flexible and adaptive, a set of guidelines have been developed to facilitate an effective use of summaries and highlighting. These guidelines are grounded in the literature in technical writing, informed by the feedback of those who have used QuikScan, and nurtured through my own practices of QuikScanning. In this section, I discuss the guidelines in the following aspects of QuikScan practice: Choosing the most appropriate placement of a summary, phrasing summary text, highlighting appropriate details.

Choosing the Most Appropriate Placement of Summaries

In Chapter 3, I discussed these three types of Boxed Summaries and categorized them by their placement within the document: Standard Summaries, Floating Summaries, and Compound Summaries.

In most standard expository documents, a Standard Summary is used after each heading to summarize the upcoming corresponding section. Figure 7.2 represents a typical standard expository document that employs a medium level of heading frequency (two headings are shown). In this case, two Boxed Summaries will be inserted to summarize the expanses of text governed by the two headings respectively.
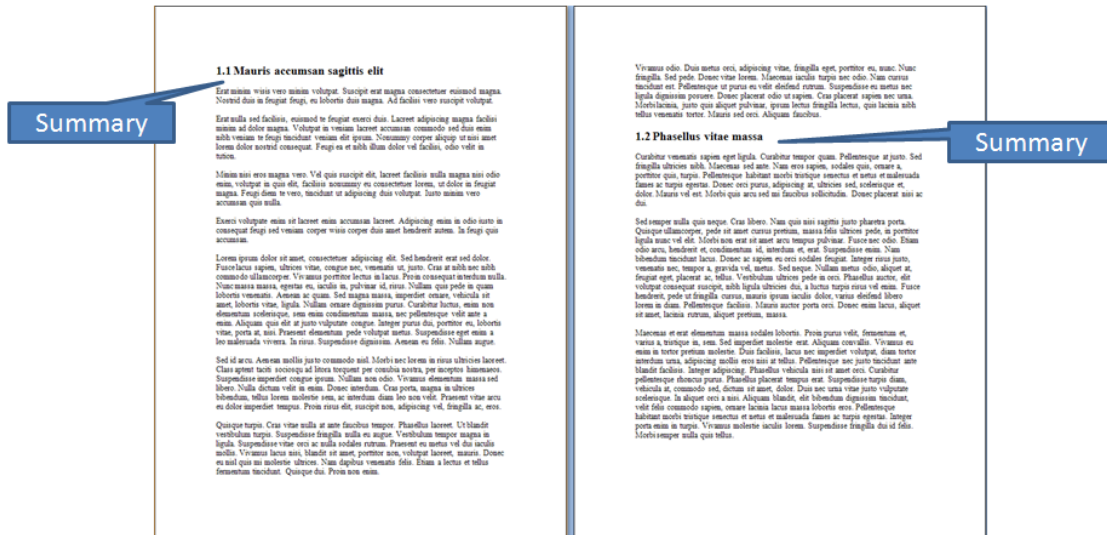
Figure 7.2 Places where Standard Summaries will be added

However, sometimes a document employs a low frequency of headings, that is, a single section led by one heading is lengthy. In a more radical situation, a document of some length lacks headings. When encountering documents of this nature, the QuikScan should consider segmenting the expanse of text.

<u>Segmenting: Dealing with lengthy passages and sections</u>

Because a prominent goal of QuikScan is to provide convenient access to details at a local level, the QuikScanner needs to segment long passages or sections. Segmenting can occur at locations where there is an apparent thematic shift signaled by transitional words, phrases, or sentences, or indicated semantically. Chambliss (1995) considers passages exceeding 1,200 words as lengthy. However, his assessment of length refers to the whole document, not a document's particular section. Bartell, Schultz, and Spyridakis (2006) explores the effect of heading frequency on comprehension through an experimental study in which they identify low frequency of headings as one heading for every 300 words, medium frequency of headings as one

heading for every 200 words, and high frequency of headings as one heading for every 100 words.

　　To provide a very rough guideline for QuikScan practice, if a section introduced by one heading exceeds 500 words, it is worth being segmented. To illustrate the segmenting strategy, let us look at the following passage. This passage contains 655 words, is governed by one heading, and advocates the use of the Internet in Chinese ESL (English as a Second Language) education[24].

> ### Building Internet communities for Chinese ESL learners
> *The People's Republic of China is embracing the English-speaking world in an increasingly digitally connected world (Jiang, 2003). Every student in today's China, starting from junior high school, has to study English as one of the three major mandatory classes until they graduate from college. In college, successfully passing a standard English test is a prerequisite for obtaining a bachelor's degree in all academic disciplines. The enthusiasm of learning English has rocketed as the giant country opens its door to the globe. "It seems there are more people learning to speak English in China than there are English speakers in the whole of the United States." (Taylor, 2002) How to improve English education becomes not only an important question, but also a complicated multi-faceted and multi-layered challenge.*
>
> 　　*"Language learning is a multifaceted social and cultural phenomenon, even more so when it involves new technologies that promote a variety of social interactions." (Kern & Warchauer, 2000) Immersing in the authentic language environment and cultural atmosphere is vital on the effects of English learning (Liu, Moore, Graham, & Lee, 2003). Among the challenges China is facing, lack of access to native speakers and authentic learning resources has been a major barrier that prevents English learners in China from learning effectively.Traditionally, since most English teachers in Chinese schools are native Chinese, English education is largely centered on drill-and-practice exercises. Teaching emphasizes grammar, reading, and writing rather than listening and speaking. Many students listen to audio tapes and short-wave broadcasting to supplement their classroom learning. Listening to the BBC World Service or the Voice of America, for example, is very popular among high school and college students. Some enthusiastic learners in college form an "English Corner," bringing people together to practice spoken English in a particular campus location at a particular time.*

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[24] This passage is used to explain segmenting; therefore, the bibliographic sources of its in-text citation are not included.

At an English Corner, students have a better chance of meeting and communicating with native speakers because foreign students from English-speaking countries join English Corner activities as well.

For teachers, how to enable a Chinese student to become an active speaker and communicator is a question central to students' needs. This article advocates that the Internet is an effective tool to aid English learners. The Internet offers interactivity, synchronous and asynchronous dialogue, real-time communication, multimedia interface and borderless accessibility (Liu et al., 2003). Internet-based tools are very helpful in second and foreign language teaching and learning (Liu et al., 2003). Although the Internet has been used in language learning by college students, little systematic and organizational effort has been made to exert the advantage the Internet has to offer. This article calls for constructing online learning communities. For the shy Chinese students (Jiang, 2003) who barely have the chances to talk with a native speaker, these online communities provide invaluable and inexpensive ways to access authentic resources.

- *The Internet provides easy accessibility to massive authentic content far beyond those currently available (Der Emde, Schneider, & Kotter, 2001).*
- *The Internet promotes autonomous learning, peer teaching, and student-centered individual learning (Der Emde et al., 2001). For one thing, this is suited to college students because they have acquired skills of self-teaching and supervision. For another, this individualized environment helps students customize learning tools their individual needs. In a traditional class, teachers are often frustrated at the gap between proficient and less proficient learners. In the online environment, tailoring to students' needs is not only possible but easy.*
- *The Internet enables students to communicate with native speakers, teachers, and peers. Synchronous communication facilitates real-time long distance interaction (Warschauer, 1997); asynchronous dialogue offers students thorough discussions on a many-many scale (Warschauer, 1997).*
- *The Internet offers a much intriguing and engaging learning environment. If well directed, it can stimulate students' interests and help learners overcome the shyness of face-to-face communication.*

Colleges ought to make an organizational effort to construct and publicize online English learning communities. Building and expanding these communities will benefit a large population of English learners.

The passage addresses two themes. First, it discusses the background and challenges of ESL education in China. Then, it explains why the Internet can be helpful and how the Internet can be implemented to assist English learners in China.

Therefore, the passage is segmented into two parts. As Figure 7.3 shows, two Boxed Summaries are used: one Standard Summary after the heading "Building Internet communities for Chinese ESL learners" and one Floating Summary at the place where the passage switches from the first theme to the second.

When segmenting, the QuikScanner should consider the length of each segment and, consequentially, the number of Boxed Summaries to be added. While having a lengthy expanse of text summarized by one Boxed Summary reduces readability, having too many short segments and frequent Boxed Summaries may disrupt the reading flow. For example, if the author of the original document frequently switches topics, it may not be necessary or appropriate to treat each topic as a segment and summarize it. The QuikScanner, therefore, must carefully assess the original document and cautiously plan the use of Floating Summaries.

Building Internet communities for Chinese ESL learners

1} Speaking English is becoming more popular in China.
2} Immersing in the language and cultural environment is important, but Chinese learners face the lack of opportunities to communicate with native speakers.

{1 The People's Republic of China is embracing the English-speaking world in an increasingly digitally connected world (Jiang, 2003)....

{2 "Language learning is a multifaceted social and cultural phenomenon, even more so when it involves new technologies that promote a variety of social interactions." (Kern & Warchauer, 2000) ...

3} This article proposes using the Internet to help Chinese learners access native and authentic resources.
4} Internet provides authentic communication content
5} Internet promotes autonomous learning, peer teaching, and student-centered individual learning.
6} Internet is a dynamic platform for learners to chat and share with peers and native speakers.
7} Internet learning is intriguing and engaging.

{3 For teachers, how to enable a Chinese student to become an active speaker and communicator is a question central to students' needs. This article advocates...
- {4 The Internet provides easy accessibility...
- {5 The Internet promotes autonomous learning, peer teaching, and student-centered individual learning. ...
- {6 The Internet enables students to communicate with native speakers, teachers, and peers. ...
- {7 The Internet offers a much intriguing and engaging learning environment. ...

Colleges ought to make an organizational effort to construct and publicize online English learning communities. Building and expanding these communities will benefit a large population of English learners.

Figure 7.3 Segmenting a lengthy passage[25]

<u>Agglomerating: Dealing with frequent headings</u>

Sometimes authors use headings frequently to introduce a number of ideas,

each of which is short. The frequent use of headings and subheadings usually results in

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[25] The Graduate School *Policy and Style Manual for Theses and Dissertation* requires that figures should not occupy more than one page. Since the complete text of this passage is long and has been provided, Figure 7.3 does not repeat the complete passage but primarily shows the QuikScan elements.

large sections containing smaller portions. Figure 7.4 shows a document of this kind.

The heading "Using Illustrations in Instruction Manual" governs five subheadings:

"Alignment," "Proximity," "Chunking," "Filtering," and "Contrast," each of which

introduces a short expanse of text. As I have explained in Chapter 3, it may not be

worthwhile to summarize each of these small sections. Instead, the QuikScanner uses

a Compound Summary to summarize the whole section.
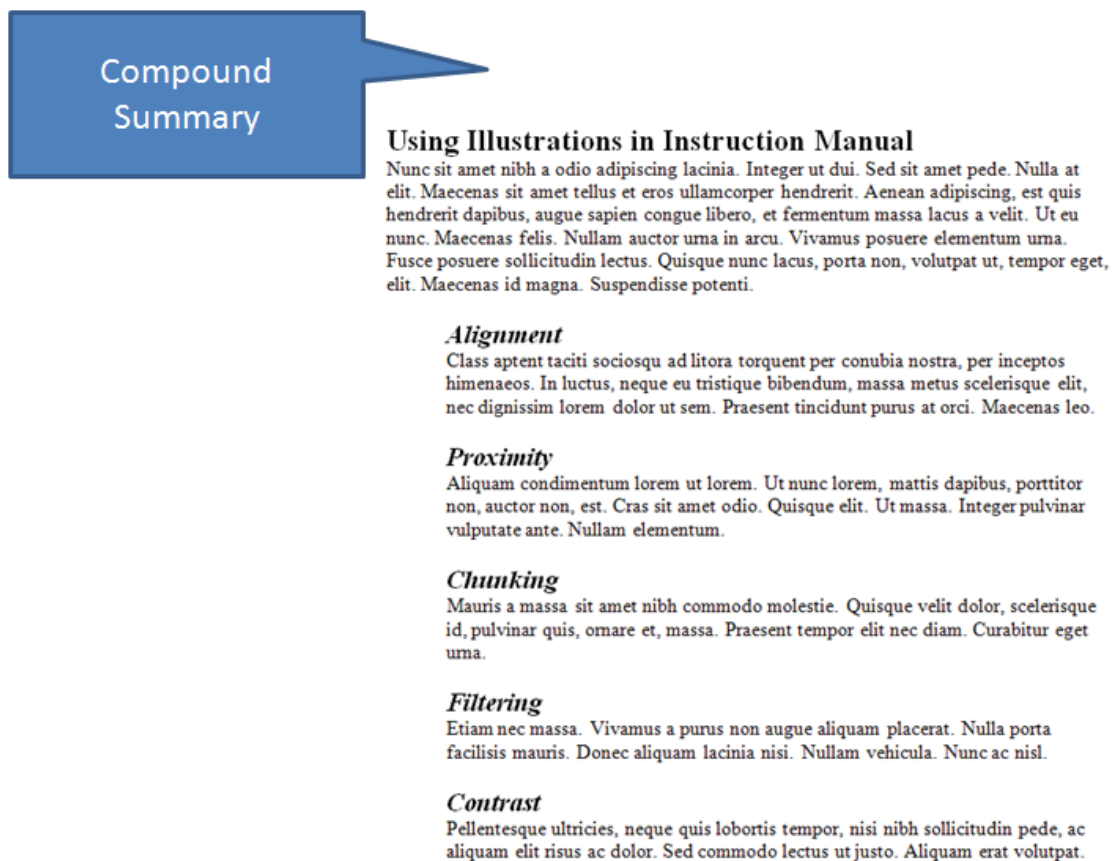
Figure 7.4 Agglomerating

Presenting Summary Text

In Chapter 3, I discussed two aspects of summary text: tuning the

informativeness of summary text and using Keyed and Unkeyed Summaries. That

discussion provides the foundation for an effective guideline on tuning the

informativeness of summary text. In this section, I do not repeat the guidelines I

provided in Chapter 3. Instead, I discuss a number of ways to effectively compose a

summary text.

The number of list items and the length of each list item

When using Keyed Summaries, that is, when using numbers or letters to "key"

the list items in the summary text with their target locations in the main body of text, a

QuikScanner has to decide how many list items to include in a single summary and

how long each of these list items should be.

Assuming that the QuikScanner is committed to providing certain ideas in a

summary, there is a trade-off between fewer but longer list items (that convey more

information) and more numerous list items that are shorter but convey less information.

The QuikScanner needs to find a balance between the number of list items and the

length of each of them. Failing to achieve an appropriate balance will reduce the

readability of the summary and even diminish the benefits of QuikScan. Figures 7.5

and 7.6 show two Boxed Summaries that hinder readability. In Figure 7.5, each list

item is long; it takes too much time for readers to process each list item; thus it goes

against QuikScan's purpose of providing information accessibility. The summary in

Figure 7.6 shares the same content with Figure 7.5 except that the content is broken

into eighteen list items, each of which is too short. An exceeding amount of cluttered

list items like the one in Figure 7.6 can reduce the readability of each list item; it can

be hard for readers to differentiate the list items; the large amount of target numbers in

the main body of text will also disrupt reading. Instead of using such a giant Boxed

Summary, the QuikScanmner could consider making each list item relatively longer,

thus reducing the total number of list items. She could also segment the original text

and summarize each segment with a separate summary. As shown in Figure 7.7, the

QuikScanner uses four Boxed Summaries (Floating), each of which becomes much

more readable.

1} Nullam pede diam, sagittis a, mollis in, lacinia vitae, metus. Morbi a enim faucibus nulla fringilla luctus. Nunc tortor lacus, mollis ac, auctor sed, laoreet vitae, enim. Vivamus dapibus facilisis augue. Vivamus ipsum odio, tempus lacinia, imperdiet sed, porttitor non, justo. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Phasellus luctus ipsum sit amet orci.

2} Maecenas viverra pede in quam. Mauris ac pede. Suspendisse semper semper ipsum. Duis lobortis suscipit urna. Nullam accumsan justo vel sem. Nam faucibus turpis et lacus. Curabitur nisl leo, mollis in, adipiscing non, semper a, purus. Sed sit amet mauris id mauris pulvinar ultricies. In tempor hendrerit sem. Sed euismod eleifend diam. Aenean vel elit quis enim egestas elementum. Ut odio. Quisque eros eros, gravida sit amet, posuere pretium, egestas non, mi. Donec viverra. Nullam mollis odio. Maecenas nec nunc. Sed tellus lorem, dictum ac, dictum in, vulputate quis, tellus.

3} Donec imperdiet. Integer elit. Suspendisse faucibus risus nec magna. Vestibulum viverra suscipit sem. Nullam tincidunt eleifend enim. Nullam et nibh. In ut purus at felis pretium pretium. Etiam nec mi. Sed pede. Sed dictum. Aenean malesuada iaculis lorem. Pellentesque tellus mi, pretium dignissim, posuere a, pharetra quis, massa. Ut ac lacus. Suspendisse velit. Aliquam ut elit vel sapien tincidunt feugiat. Aliquam commodo diam ut ante. Ut et lectus id quam egestas tincidunt.

Figure 7.5 Lengthy list items

1} Nullam pede diam, sagittis a, mollis in, lacinia vitae, metus.

2} Morbi a enim faucibus nulla fringilla luctus. Nunc tortor lacus, mollis ac, auctor sed, laoreet vitae, enim. Vivamus dapibus facilisis augue.

3} Vivamus ipsum odio, tempus lacinia, imperdiet sed, porttitor non, justo. Lorem ipsum dolor sit amet, consectetuer adipiscing elit.

4} Phasellus luctus ipsum sit amet orci.

5} Maecenas viverra pede in quam. Mauris ac pede. Suspendisse semper semper ipsum.

6} Duis lobortis suscipit urna. Nullam accumsan justo vel sem.

7} Nam faucibus turpis et lacus. Curabitur nisl leo, mollis in, adipiscing non, semper a, purus. Sed sit amet mauris id mauris pulvinar ultricies.

8} In tempor hendrerit sem. Sed euismod eleifend diam.

9} Aenean vel elit quis enim egestas elementum. Ut odio.

10} Quisque eros eros, gravida sit amet, posuere pretium, egestas non, mi.

11} Donec viverra. Nullam mollis odio. Maecenas nec nunc.

12} Sed tellus lorem, dictum ac, dictum in, vulputate quis, tellus.

13} Donec imperdiet. Integer elit. Suspendisse faucibus risus nec magna.

14} Vestibulum viverra suscipit sem. Nullam tincidunt eleifend enim. Nullam et nibh.

15} In ut purus at felis pretium pretium. Etiam nec mi. Sed pede. Sed dictum.

16} Aenean malesuada iaculis lorem. Pellentesque tellus mi, pretium dignissim, posuere a, pharetra quis, massa.

17} Ut ac lacus. Suspendisse velit. Aliquam ut elit vel sapien tincidunt feugiat.

18} Aliquam commodo diam ut ante. Ut et lectus id quam egestas tincidunt.

Figure 7.6 The number of list items hinders readability

1} Nullam pede diam, sagittis a, mollis in, lacinia vitae, metus.
2} Morbi a enim faucibus nulla fringilla luctus. Nunc tortor lacus, mollis ac, auctor sed, laoreet vitae, enim. Vivamus dapibus facilisis augue.
3} Vivamus ipsum odio, tempus lacinia, imperdiet sed, porttitor non, justo. Lorem ipsum dolor sit amet, consectetuer adipiscing elit.
4} Phasellus luctus ipsum sit amet orci.
5} Maecenas viverra pede in quam. Mauris ac pede. Suspendisse semper semper ipsum.

6} Duis lobortis suscipit urna. Nullam accumsan justo vel sem.
7} Nam faucibus turpis et lacus. Curabitur nisl leo, mollis in, adipiscing non, semper a, purus. Sed sit amet mauris id mauris pulvinar ultricies.
8} In tempor hendrerit sem. Sed euismod eleifend diam.
9} Aenean vel elit quis enim egestas elementum. Ut odio.
10} Quisque eros eros, gravida sit amet, posuere pretium, egestas non, mi.
11} Donec viverra. Nullam mollis odio. Maecenas nec nunc.

12} Sed tellus lorem, dictum ac, dictum in, vulputate quis, tellus.
13} Donec imperdiet. Integer elit. Suspendisse faucibus risus nec magna.
14} Vestibulum viverra suscipit sem. Nullam tincidunt eleifend enim. Nullam et nibh.
15} In ut purus at felis pretium pretium. Etiam nec mi. Sed pede. Sed dictum.

16} Aenean malesuada iaculis lorem. Pellentesque tellus mi, pretium dignissim, posuere a, pharetra quis, massa.
17} Ut ac lacus. Suspendisse velit. Aliquam ut elit vel sapien tincidunt feugiat.
18} Aliquam commodo diam ut ante. Ut et lectus id quam egestas tincidunt.

Figure 7.7 Replacing one unreadable summary with multiple readable summaries

Itemized or holistic summary text

Keyed Summaries are necessarily itemized through the use of numbers and letters. In an Unkeyed Summary, however, the summary text can be written as items or as holistic paragraphs. In other words, the Unkeyed Summary takes the form of individual items formatted in list form, but these items do not have numbers or letters

corresponding to target locations in the main body of text. There are no strict rules

regarding when to use itemized summaries and when to use holistic summaries; in fact,

summary types should be used flexibly. Here, I provide general guidelines on how to

make the best use of itemized and holistic summaries.

When the summary text contains rich information and is relatively long,

itemizing helps distinguishing content items and improving information accessibility.

Take the summary in Figure 7.8 as an example, it is written holistically in a paragraph

format, but is not much different from a typical paragraph in the main body of text. As

a matter of fact, it is a summary that may need to be summarized. Itemizing this

summary could make its main points salient. Figure 7.9 shows the itemized version of

the same summary. It is easy to see the four points of the summary.

Aliquam erat volutpat. Maecenas laoreet diam ac justo. Duis posuere porttitor nisi. Curabitur ut eros. Nullam orci. Nullam ultrices, nulla sit amet sagittis cursus, orci mauris tempus neque, at convallis nisi velit vitae nisl. Suspendisse porta hendrerit turpis. Ut ut sem. Mauris ultricies, nulla vulputate porta laoreet, nibh est ullamcorper diam, et cursus mauris pede non nisl. Sed odio ante, varius imperdiet, condimentum vitae, luctus vel, augue. Nullam felis risus, eleifend a, cursus vel, vestibulum in, orci. Proin lacinia congue velit. Nunc ipsum lectus, vestibulum in, gravida vitae, pharetra at, velit. Praesent viverra venenatis sem.

Figure 7.8 A lengthy holistic summary

►Aliquam erat volutpat. Maecenas laoreet diam ac justo. Duis posuere porttitor nisi. Curabitur ut eros. Nullam orci. Nullam ultrices, nulla sit amet sagittis cursus, orci mauris tempus neque, at convallis nisi velit vitae nisl. Suspendisse porta hendrerit turpis.
►Ut ut sem. Mauris ultricies, nulla vulputate porta laoreet, nibh est ullamcorper diam, et cursus mauris pede non nisl.
►Sed odio ante, varius imperdiet, condimentum vitae, luctus vel, augue. Nullam felis risus, eleifend a, cursus vel, vestibulum in, orci. Proin lacinia congue velit.
►Nunc ipsum lectus, vestibulum in, gravida vitae, pharetra at, velit. Praesent viverra venenatis sem.

Figure 7.9 An itemized summary

In addition to readability, the QuikScanner should consider the goals of the target readers in making her decisions. Usually, readers who are mostly interested in locating information will benefit from summaries in which content items are itemized (keyed or unkeyed). These readers may not benefit from a lengthy holistic summary or an itemized summary whose list items are lengthy.

However, although a holistic summary does not provide much information accessibility to the section it summarizes, it can be convenient for readers to decide whether they pursue this section, especially when readers are familiar with the subject of the document. In other words, at the global level (the whole document), a holistic summary saves readers the time they would otherwise spend on reading list items they may not be interested in. Readers intent on information seeking may benefit from a short holistic summary in a sense that the summary tells them whether they should read that section or skip.

Holistic summaries can also be very helpful for those who are familiar with the subject matter of the document. Take the following summary for example:

This section discusses the replication of the cell's DNA.

This summary is appropriate for a reader who has prior knowledge of the replication of the cell's DNA because it clearly states what the reader needs to know. The reader can decide whether to continue reading.

By contrast, a reader who has no such prior knowledge may benefit from the following alternative summary that explains the basic mechanism of replication.

Before a cell divides, it needs to copy that DNA completely and accurately so that its progeny will also be able to reproduce and function. This copying process is called replication.

<u>Mixing summary types</u>

So far, I have introduced a number of summary types according to different dimensions. I rewind them here in Table 7.1. Depending on the placement of the summaries, there are three types of Boxed Summaries: Standard, Floating, and Compound. In addition to summary placement, I have categorized the way summary text is presented according to three dimensions. Depending on the informativeness of summary text, there are descriptive and informative summaries. Depending on whether the summary text is keyed to the main body of text (through numbers or letters), there are Keyed Summaries and Unkeyed Summaries. Additionally, sometimes a Boxed Summary can be written holistically in paragraph format while sometimes it explicitly lists summary items in a bullet point format.

Table 7.1 QuikScan summary types

Summary placement	Standard Summary
	Floating Summary
	Compound Summary
Summary text	Descriptive Summary
	Informative Summary
	Keyed Summary
	Unkeyed Summary
	Itemized Summary
	Holistic Summary

By categorizing different types of summaries, I seek to concretely illustrate the design of QuikScan. I do not, however, intend to set boundaries and limits on the use of these summaries (e.g., using one type of summary strictly throughout a document).

In the real world, the QuikScanner often needs to use one or more summary types in a single document. Furthermore summary types may overlap with one another. For example, the summary in Figure 7.10 is a Floating Summary written holistically.

ligula fringilla pharetra condimentum, quam ligula bibendum velit, vitae scelerisque nisl felis quis risus. Aenean laoreet vulputate pede. Duis consectetuer. Maecenas condimentum. Duis vehicula aliquet massa. Suspendisse pharetra arcu sit amet dolor. Aliquam erat volutpat. Etiam pulvinar lorem id eros.

Donec felis urna, faucibus vel, tincidunt et, laoreet non, justo. Cras posuere. Ut eleifend. Proin in urna vel arcu scelerisque faucibus. Ut lobortis tristique mauris. Integer eu leo ut ipsum suscipit tristique.

Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Nam non lectus. Mauris sit amet est sit amet magna eleifend mattis. Praesent scelerisque. Mauris venenatis est sed tortor. Proin aliquam commodo neque. Proin arcu sem, bibendum ut, ornare mattis, mollis id, enim. Maecenas lacinia mattis metus. Donec venenatis adipiscing diam. Vivamus elementum egestas ipsum. Phasellus fringilla

Figure 7.10 A holistic Floating Summary

Sometimes, the QuikScanner will use one type of summary consistently throughout a document; often, she doesn't need to consistently use one summary type. For instance, Figure 7.11 shows a document that uses a Standard Summary to summarize a section and an Unkeyed Summary just for the illustration. Note that the Unkeyed Summary is itemized; it is more readable than a paragraph format.

Figure 7.11 The use of a Standard Summary and an Unkeyed Summary

Figure 7.12 shows a scenario in which the target audience is mostly interested in locating information in the section governed by the second heading; therefore, a holistic summary is used for the first section and a Standard Summary (keyed) is used for the second section.

Proin fermentum leo ut dignissim cursus sem libero mollis massa

Duis sodales sagittis orci. Morbi fermentum. Cras condimentum lacinia turpis. Nunc gravida neque sit amet ipsum. Suspendisse et neque. Nunc bibendum euismod est. Donec tempus ligula in massa.

Phasellus augue. Aliquam posuere nibh vitae lacus. Etiam auctor. Fusce dapibus. Etiam sed enim. Suspendisse potenti. Nunc semper dolor. Nulla eleifend lobortis justo. Integer vitae diam eu nunc vestibulum adipiscing. Sed tempus elit. In pretium sapien non nisl. Integer convallis sem ut nisi.

Fusce molestie mi vel dolor. Nam sed nibh quis velit vulputate euismod. Phasellus vitae justo in velit euismod lacinia. Mauris vel felis quis mauris vehicula dignissim. Aliquam odio odio, condimentum in, adipiscing sagittis, consequat ut, magna. Etiam fermentum pulvinar augue. Sed quis pede vitae neque egestas tempor. Duis vel turpis eu purus adipiscing aliquet. Quisque blandit, dui a aliquet varius, sem turpis blandit orci, ut iaculis sem felis in mauris. Cras diam dolor, dignissim eget, imperdiet eget, aliquet quis, elit. Cras consectetuer, lacus et mattis lacinia, orci leo vehicula ligula, nec congue tortor magna vel lacus. Morbi sed urna et metus dignissim malesuada. Cras erat. Nam hendrerit, velit ac porta imperdiet, enim pede placerat odio, a vestibulum turpis erat vitae tortor. Maecenas at orci. Mauris cursus, urna eget pharetra placerat, dui sem ullamcorper turpis, eget hendrerit lacus arcu ac felis. Nulla facilisi. Phasellus at lectus vel tortor dignissim ornare. Duis metus.

Etiam lorem. Suspendisse turpis mauris, condimentum consequat, posuere ut, tristique quis, nunc. Etiam ligula pede, sodales quis, malesuada eu, tincidunt hendrerit, lorem. Etiam ligula justo, viverra et, iaculis vel, faucibus ac, ipsum. Nam et turpis. Aliquam eu pede id leo semper ultricies. Duis ut risus eu nibh facilisis fermentum. Nam eget ipsum. Phasellus dui est, tincidunt vitae, consequat vel, facilisis non, metus. Praesent magna justo, euismod a, faucibus nec, mattis eget, tellus.

Phasellus tincidunt, lectus id volutpat egestas, nulla felis cursus purus, eget volutpat quam odio vitae dolor. Nunc non lectus. Duis aliquet nunc sit amet nisl. Maecenas pulvinar dictum arcu. Mauris orci. In eleifend laoreet nunc. Maecenas mauris urna, congue et, malesuada et, fermentum molestie, sapien. Curabitur tellus pede, vehicula nec, volutpat at, gravida non, augue. Proin aliquet convallis magna. Donec id nibh. Duis tincidunt. Nam lobortis facilisis massa. Aenean porta nunc ac mauris. Pellentesque turpis eros, accumsan eget, auctor eget, congue venenatis, odio.

Sed ut mi id eros consectetuer accumsan. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Cras porttitor vulputate arcu. Sed iaculis

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mauris eget orci. Proin pretium libero eu elit. Cras auctor est eu nunc. Donec at elit. Donec vel elit.

Duis mi lorem vestibulum eget pulvinar vitae fermentum ut, mi.

1) Morbi ullamcorper. Integer nec lorem. Sed viverra, tortor ac interdum ullamcorper, magna elit volutpat nunc, ac placerat justo urna eu risus.
2) Nunc auctor mollis leo. Fusce pulvinar enim ac dui.
3) Curabitur consequat dolor et odio. Proin ultricies vulputate risus. Sed dictum laoreet urna.

[1] Nullam pharetra mi ac eros. Nunc non orci. Donec eu libero. Curabitur orci turpis, cursus et, tincidunt eu, molestie quis, nunc. Nullam sollicitudin sem id eros. Donec semper, felis id faucibus sagittis, arcu nisi condimentum lacus, vitae aliquet arcu ligula eget metus. Donec tempus dapibus diam. Etiam aliquam justo ut arcu imperdiet tempus. Sed malesuada, quam eu aliquam placerat, dolor arcu posuere nisl, at blandit risus justo vel diam. Vivamus adipiscing facilisis metus. Integer nec purus non enim ullamcorper gravida. Aliquam rhoncus tempus lectus. Donec in magna. Suspendisse laoreet augue lacinia libero. Aenean at est. Etiam vel leo. Cras faucibus venenatis tortor. Ut gravida eleifend tellus.

Fusce viverra purus sed lorem. Nullam id lectus. Maecenas a libero sed risus suscipit tincidunt. Phasellus interdum turpis eu magna. Aenean ultrices tellus. Morbi pharetra, sem vel sagittis egestas, nisl mauris pharetra tellus, vitae venenatis magna est adipiscing sem. Curabitur cursus justo at elit. [2] Nunc volutpat ligula ut nunc scelerisque facilisis. Integer ornare viverra nunc. Vivamus tincidunt mattis ante. Nunc eget lacus. In congue velit sed metus. Nulla quam massa, volutpat at, laoreet vitae, blandit dapibus, lacus.

Nunc vitae enim nec lectus rutrum pellentesque. Aliquam erat volutpat. Phasellus dictum pede et dolor. In hac habitasse platea dictumst. Nam tempor commodo sapien. Etiam ornare. Sed quis nisl vitae enim mattis faucibus. Maecenas suscipit convallis risus. Vestibulum vitae mi. Vivamus aliquam rutrum nisl. Sed eu nunc congue ante tempus pulvinar. Vivamus tincidunt, nibh sodales lobortis volutpat, nisi lacus porta arcu, at congue arcu diam vel metus. Morbi eget risus.

[3] Curabitur rutrum, magna adipiscing faucibus viverra, libero sapien ultrices lectus, vitae lacinia enim ante vel ipsum. Proin euismod faucibus neque. In hac habitasse platea dictumst. Nam metus. Aliquam aliquam leo sed nisl. Nullam vitae ligula a est egestas lacinia. Nulla a ligula. Nullam tempor. Aliquam sed magna. Donec facilisis. Proin libero nulla, fermentum a, consequat nec, accumsan non, elit. Morbi arcu. Fusce at nunc. Pellentesque augue dolor, luctus at, porttitor vitae.

Figure 7.12 Mixing summary types

There is virtually no end in listing all the possible scenarios. Ultimately, mixing summary types depends on the nature of the original document, the goals and characteristics of the readers, the requirements of stakeholders.

Highlighting Appropriate Details

I have explained the value of highlighting in Chapter 3. However, highlighting may not be useful unless it's appropriately practiced. First, the QuikScanner must limit the amount of highlighting. During several pilot tests in my research, participants mentioned that too much highlighting, especially when the highlighting repeats the content in the summaries, can be distracting. An excessive amount of highlighting can distract readers (Jonassen, 1985). Figure 7.13 shows an example of highlighting that is distractive. Considering that the body of the document has target numbers (as is typically the case), the combination of target numbers and extensive highlighting may

well overwhelm the reader. Furthermore, since the purpose of highlighting is to spotlight important details, an exceeding use of highlighting diminishes the uniqueness of each highlighted item, making readers spending more time processing highlighted sentiments.

1} The Internet has revolutionized the computer and communications—it is a medium of broadcasting and a platform for collaboration.
2} The Internet is a successful instance of sustained investment and industry academic collaboration.
3} This paper provides a history with four aspects.

{1 The Internet has revolutionized the computer and communications world like nothing before. The invention of the telegraph, telephone, radio, and computer set the stage for this unprecedented integration of capabilities. The Internet is at once a world-wide broadcasting capability, a mechanism for information dissemination, and a medium for collaboration and interaction between individuals and their computers without regard for geographic location.

{2 The Internet represents one of the most successful examples of the benefits of sustained investment and commitment to research and development of information infrastructure. Beginning with the early research in packet switching, the government, industry and academia have been partners in evolving and deploying this exciting new technology. Today, terms like "bleiner@computer.org" and "http://www.acm.org" trip lightly off the tongue of the random person on the street.

This is intended to be a brief, necessarily cursory and incomplete history. Much material currently exists about the Internet, covering history, technology, and usage. A trip to almost any bookstore will find shelves of material written about the Internet.

{3 In this paper, several of us involved in the development and evolution of the Internet share our views of its origins and history. This history revolves around four distinct aspects. There is the technological evolution that began with early research on packet switching and the ARPANET (and related technologies), and where current research continues to expand the horizons of the infrastructure along several dimensions, such as scale, performance, and higher level functionality. There is the operations and management aspect of a global and complex operational infrastructure. There is the social aspect, which resulted in a broad community of Internauts working together to create and evolve the technology. And there is the commercialization aspect, resulting in an extremely effective transition of research results into a broadly deployed and available information infrastructure.

Figure 7.13 An excessive amount of highlighting

An issue related to overcuing is the likelihood of repetitive cuing: one content item summarized and highlighted simultaneously. Let us look at the example in Figure 7.14. This summary introduces technical communication. It mentions the skills needed to succeed as a technical communicator: language, visual, and analytic skills. However, this same information is highlighted in the main body of text. When a reader encounters the highlighted part, she is likely to assume that this is something important that must be emphasized in addition to the items in the Boxed Summary. She might, therefore, be confused at why the same information is being highlighted; she might assume that there is a difference between what is summarized and what is highlighted, when the same information is simply cued repeatedly. She might even start to compare the two and look for a difference. All of these contributes to frustration and slows down her reading. As a general rule, if a content item has been included in a summary, it should not be highlighted simultaneously.

1} The purpose of Technical Communication is to make technical information more accessible.
2} As a fast growing field, TC concerns itself with both print and other communication environments.
3} Technical communication often begins with design process and ends after the final usability evaluation. Language, visual, and analytic skills are needed.

{1 The purpose of Technical Communication is to serve as the primary communication line between technology and its users, and between scientists and the users of scientific information. Its goal is to make technologies more useful and meaningful and scientific information more accessible.

{2 Technical Communication is one of today's fastest changing and fastest growing fields in academia and industry. Not long ago, TC concerned itself almost exclusively with print documents. Today, however, the work of a technical communicator varies greatly among different working environments.

{3 The involvement of technical communicators often begins with the design process and ends after the final testing of product usability and user support. In order to complete this process, a technical communicator must be able to interpret and present complex information in a readable form to various types of audiences. A strong combination of language, visual, and analytical skills is necessary to succeed.

Figure 7.14 A content item summarized and highlighted simultaneously

7.1.3 Evaluation

Revising and editing content

"Revising, [r]evising, [r]evising." (Alley, 1996, p. 245) "Revision is the key to strong scientific writing." (Alley, 1996, p. 245) In QuikScan summaries, there is no space for redundant information, nor is there any space for sentences that are not accurate, concise, and clear. QuikScanners should always write terse summaries and avoid highlighting more of the author's original text than is necessary.

Revising the draft version of a QuikScanned document consists of two aspects: revising the draft content and revising the mechanics of writing. Revising the draft content is important because QuikScan must be rigorous enough to convey superordinate ideas and subordinate but important details. When revising a QuikScanned draft, the QuikScanner is likely to do the following things. First, she

needs to assess the completeness of covering superordinate ideas. She needs to check whether all superordinate ideas are summarized. Second, she needs to differentiate different levels of superordination. Some content items may be more paramount than others. Since the summaries must be concise, the QuikScanner ought to evaluate content items of different importance and ensure that those appear in the Boxed Summaries are the most superordinate ones. Third, the QuikScanner needs to evaluate the exactness of highlighting. Since highlighting is used cautiously, it must be to-the-point, revealing vital information without overwhelming readers. Additionally, the QuikScanner needs to evaluate whether each summarized item in a Boxed Summary is accurately keyed to the corresponding locations in the main body of text. She also needs ensure that jargons and technical terms, if included in the summaries, are explained or at least refereed to the main body of text. Since a reader typically reads the summary prior to the main body of text, unfamiliar terms can create frustration. The QuikScanner also needs to be aware that a reader may choose to skip the whole main body of text and just read the summaries. Therefore, she should try to achieve coherence among Boxed Summaries.

Editing the mechanics of writing involves polishing summary items and proofreading for grammatical errors. The QuikScanner should keep the summary text as concise as possible while conveying essential information.

Conducting user testing and stakeholder reviews

Evaluation a QuikScanned document typically involves target readers and major stakeholders. Interacting with target readers informs the QuikScanner of

readers' needs. Consulting with stakeholders clarifies project goals and logistics.

Evaluation, importantly, does not always come at the end of a QuikScanning activity.

As indicated by the curved arrows in Figure 7.1, evaluation can take place in every

phase of QuikScanning and can occur iteratively. A number of widely user-centered

design methods can be adopted to evaluate an evolving document against reader

performance and feedback. These include but are not limited to surveys, interviews,

focus groups, observations, usability lab tests, personas, and eye tracking. Although

my dissertation does not delve deep into the use of these methods in the QuikScan

process, I suggest future research ideas in Chapter 8.

7.2   Training Readers

Compared to training QuikScanners, training readers is relatively easier. To a

large extent, QuikScan is self-explanatory. A "Reader's Guide to QuikScan" has been

prepared and was used in the two empirical studies reported earlier. Figure 7.15 is the

most recent version of the guide. In the pilot tests and the empirical studies, it took

less than two minutes for the readers to understand QuikScan. Because the design of

QuikScan evolved after the empirical studies were conducted, the reader's guide used

in the studies (Appendix A) slightly differs from the most recent version displayed

here.

Reader's Guide to QuikScan

QuikScan is a set of techniques that we apply to a document in order to make it faster for you to read. We don't re-write the document. We write a summary in which each part of the summary starts with a number that corresponds to the same number in the main body of text where the summarized item is explained in full. See the following example:

Economic Feasibility of Supplying Redcedar to Manufacturers

1} The government funds extraction.
2} The costs to landowners are almost entirely transportation.
3} These transportation costs should typically be $9.25/ton.

{1 Currently landowners can make use of state and federal programs that fully subsidize the cost of extracting or otherwise removing redcedar from their property. {2 Therefore, the cost to landowners of supplying redcedar to manufacturers consists almost entirely of transportations costs. Transportation costs will vary for each landowner depending upon the vehicle load, distance to the manufacturer, and the costs of gasoline. {3 Our estimate, however, is that most landowners can deliver round wood or whole-tree redcedar to a manufacturer for approximately $9.25/ton, assuming a 100 mile delivery trip and a no-cargo return trip.

Figure 7.15 Reader's Guide to QuikScan

7.3   Limitations of Usage

QuikScan can be applied to most expository and explanatory genres. It can also be used to effectively synthesize non-textual content such as figures and tables when they appear within documents. However, when encountering documents that mostly consist of bullet points, photographs, drawings, maps, or number lists, the QuikScanner should be flexible. She should analyze the nature of the document and decide whether to use QuikScan, to what extent QuikScan should be used, and how it can be used meaningfully. Sometimes the author has taken pains to strongly emphasize key points. The document is organized in a highly schematic manner, employing an extensive set of features aimed at improved reading and information seeking; an executive summary, a table of contents, frequent preview statements, ample headings, and an index. Although QuikScan augments the function of each of

these features, it may not be worthwhile for a document that is schematically organized and endowed with a full set of features that resemble QuikScan.

In addition to these document genres, contextual limitations also caution against the use of QuikScan. For example, a chemical manufacturer provides a health and safety brochure regarding the safe use of the chemical and states that customers should carefully read this information sheet. Many customers may choose to read the brochure selectively to find the information most relevant to their situation. But for reasons of legal liability, the manufacturer is unlikely to employ QuikScan to facilitate such selective reading. QuikScan should not be applied to court documents in the United States. Such use may disqualify evidence from being admitted to all levels of courts. In business situations, information confidentiality may mandate whether a document can be QuikScanned and by whom it should be QuikScanned. Additionally, ethics must be taken into consideration when QuikScanning documents. The QuikScanner should consider copyright and authorship issues. She should also present truthful information that is not intended for propaganda and other ill-conceived purposes.

This chapter has taken Chapter 3 further and has explained how QuikScan can be effectively implemented. I have explained the QuikScan process, discussed a number of guidelines, described reader training, and noted on the limitations of using QuikScan. I should note that because QuikScan will continue to be refined, new guidelines are likely to emerge. In the next chapter, I discuss the major contributions of this dissertation, explain its limitations, and provide ideas for future research.

Chapter 8: Conclusion

Through creating, validating, and analyzing the new document format QuikScan, I bring innovative perspectives into the research and practice of information design and technical communication in general.

In Chapter 1, I introduced the background and purpose of this research. I identified four areas of investigation: *using signals to improve document use—the design of QuikScan*, *validating the effectiveness of QuikScan on multiple reading behaviors*, *examining the rhetorical implications of QuikScan*, and *exploring the applications and implementation of QuikScan*. To explain the ground upon which QuikScan was developed and studied, I devoted Chapter 2 constructing a conceptual framework that brings together knowledge from multiple disciplines including information design, reading, information seeking, particularly reading signals, and technical writing. The literature that composes this conceptual framework directly informs how QuikScan was designed and studied and how it should be implemented. In Chapter 3, I explored the first of my four areas of investigation by introducing the components of QuikScan, explaining design ideas for various contexts of document use, and devising design solutions for using QuikScan on Web pages. In Chapter 4, I explored the second area of investigation through two empirical studies. These two studies demonstrate the complex and intriguing effectiveness of QuikScan in reading comprehension, retention, and information seeking. In Chapter 5, I focused on the third area of investigation: rhetorical implications. I analyzed the multi-faceted roles

of the QuikScanner and the readers of QuikScanned documents, and revealed the

rhetorical dynamics of the QuikScan process. Such an analysis, intriguingly, created

an avenue for me to explore the rhetorical role of "document intermediary" and to add

my own contribution to the understanding of author-reader relationships. Chapters 6

and 7 investigated the fourth area: applications and implementation. In Chapter 6, I

discussed a number of special areas where QuikScan can be particularly valuable:

assisting business meeting attendees, visually impaired readers, and RSS feed users. I

devoted Chapter 7 to the implementation of QuikScan, where I explained the typical

QuikScanning process and provided QuikScanning guidelines. From Chapter 3 to

Chapter 7, each chapter is relatively independent, dealing with one particular aspect of

QuikScan. However, these chapters were not randomly developed and assembled.

They follow a logical flow from creating, examining, to applying an information

design idea. Through this dissertation, readers should be able to acquire a

comprehensive understanding of QuikScan and obtain the basic knowledge needed to

read QuikScanned documents and become QuikScanners. For the rest of this chapter, I

first highlight the most important points I have made in my dissertation, and then

address the limitations of this research and provide ideas for future endeavors. Finally,

I invite writers of all kinds to adopt QuikScan in their document use.

8.1   Highlights of this Dissertation

As I mentioned earlier, this dissertation follows the process of creating,

validating, and analyzing a document format. It is ambitious in that it addresses a wide

range of issues; therefore, its implications are broad and significant. The most

important contributions of my dissertation are set forth below.

The first and foremost contribution is the QuikScan format. Drawing upon the literature on reading and information design, QuikScan selectively but effectively mixes existing document formats and reading signals. The most prominent feature of QuikScan is the use of multiple "local" summaries. While much research in the literature examines traditional summaries, QuikScan breaks this boundary by summarizing chunks of information at a local level. These local summaries, tied to their corresponding sections, provide information access to the reader at a higher level of granularity. Therefore, my research has been more innovative than many previous attempts in that it does not focus on any existing document format or reading signal but rather offers a new format. My research also differs from those who focused on such radical document formats as STOP and IMAP. STOP and IMAP, as I have explained earlier, require the writer to depart completely from the standard expository the readers expect in most genres. QuikScan, by contrast, accords with the standard expository model—the dominant document format. While being innovative, QuikScan preserves the structure of standard expository documents and is less disruptive of current information design practice. It is largely simple, parsimonious, and intuitive.

Through the first empirical study, I have proved that QuikScan enhanced students' reading comprehension of a relatively difficult document and has the potential of improving retention. I have also shown, through the second empirical study, that QuikScan enables readers to seek information more efficiently. The result of the information seeking study on the three types of questions is particularly helpful

for it shows the value of QuikScan in emphasizing certain parts of a document and differentiates readers' performance on those content items that are emphasized and not emphasized.

Technical communication practitioners can implement QuikScan in a wide range of documents, especially those likely to be read selectively. The various design components provide practitioners means to adapt their QuikScanning toward particular reading contexts and reader needs. This research implies that practitioners could consider using QuikScan on documents that are read collaboratively in meetings, especially when such a collaborative document use is under time pressure. Technical communicators can apply QuikScan in organizational and corporate documents and facilitate productive decision-making in business meetings. Another valuable application of QuikScan, as mentioned by some participants in the empirical studies, is textbooks and learning materials. Educational publishers could consider QuikScanning long textbooks. Additionally, information designers who work in the field of accessibility may use QuikScan to assist visually impaired readers in their document use and Web browsing.

Another contribution of my research lies in the rhetorical analysis. Although some scholars in technical communication have been constructing the bridge between information design and rhetoric, such an activity is not widespread. I expand the prevailing empirical research tradition in the area of information design by analyzing the rhetorical implications of QuikScan. My rhetorical analysis has not only theoretical meaningfulness for researchers but also pragmatic values for practitioners.

For researchers, my analysis reveals the complex and dynamic QuikScan process in which the author, the QuikScanner, and the reader play multiple roles and form various relationships, real and virtual. It enables existing rhetorical theories on author-reader relationships to accommodate a wide range of intermediary practices that have been neglected. Without probing the relationships facilitated by QuikScan, we are not able to fully understand how readers interact with QuikScanned documents. Broadly speaking, without broadening the scope of our rhetorical analysis to multiple roles and relationships facilitated by an information design technique, we would not fully understand the invisible interactions behind cold empirical numbers.

In the practitioners' world, rhetoric is not a term that is typically associated with the practicality of information design. I believe, however, that documents fail if information designers don't understand or simply ignore the rhetorical dynamics of document use. I consider the values of my rhetorical analysis to practitioners in two aspects. The first aspect deals with how my analysis enables information designers to become QuikScanners. The second aspect is concerned with how my analysis helps technical communicators recognize the nature of their work in general. When an information designer becomes a QuikScanner, she needs to learn to be a reader who correctly comprehends an existing document and an augmenter who maintains an appropriate balance between adhering to the semantic meaning of the original document and tailoring the document toward particular goals and needs. This means she must assess the intention of the original author including the invoked reader of the original document. She must learn about her readers, her stakeholders, and invoke a

reader whose profile can be comfortably assumed by the target readers. Realizing the complex relationships among the author, the QuikScanner (or augmenter), and the reader helps information designers see their work not as a mechanical process, not as a surrogate process (a process in which the information designer is seen as relatively unimportant), but as a part of a larger discourse in which the original author's intentions, the readers' needs, and the stakeholders' goals come into play, a discourse where she is the center.

8.2   Limitations

Despite the large amount of work in design, validation, and analysis, limitations in time and resources constrained this dissertation. Although I have devised various design solutions for using QuikScan in different genres of documents and different reading contexts, my coverage is not exhaustive. Regarding document genres, my design is largely based on documents that fit with the Standard Expository Model (SEM). Although I have briefly touched the QuikScanning of Web pages, many document genres are not fully addressed. This includes but is not limited to newspapers, magazines, newsletters, brochures, posters, and maps. In regard to reading contexts, my design mostly focuses on reading comprehension and information seeking.

Because the scope of the dissertation is ambitious, I do not concentrate my efforts on completely investigating different designs for each of the reading behaviors. That is, I attempt to accommodate special reading circumstances such as document use by business meetings attendees, visually impaired readers, and RSS feeds users. But

no further work has been done to vary the design to fit any of these special

circumstances. For instance, I do not differentiate the design of QuikScan for general

reading and business meetings. I have also devised design solutions for using

QuikScan on Web pages. However, I do not address the design for different genres of

websites, different levels of interactivity, different lengths of pages, and different

navigation structures. For instance, when a single article is presented in a series of

linear Web pages, one section may spread to two or more Web pages. The current set

of QuikScan components and the guidlelines for using them may not be the most

effective solution.

An important goal of my dissertation is to validate the effectiveness of

QuikScan. A number of factors made me take a selective approach in empirical

validation. First, it is infeasible to conduct empirical research on every design

component and every reading context. Second, the design of QuikScan has been

evolving and will continue to evolve. The version used in the empirical studies, does

not, in fact, reflect the most recent design. In addition, although the passages used in

the studies were QuikScanned by two members of the Directed Research Group, a

wider variety of QuikScanners could potentially improve the quality of the

QuikScanning.

A final limitation is this: although this dissertation creates and publicizes the

QuikScan format, it is nonetheless not presented in the QuikScan format. Over the

several years during which this project has evolved, colleagues and friends have asked

whether I would QuikScan my dissertation. Despite my enthusiasm for this endeavor,

I believe that QuikScanning a dissertation about QuikScan can produce confusing results. It would be very confusing to add QuikScan components to a document that employed QuikScan examples, thus making it harder for readers to differentiate QuikScan elements that summarize my dissertation and those used as examples. Ironically, one of the least likely candidates for QuikScanning is a document that explains QuikScanning.

8.3   Future Work

This dissertation should not be seen as the end of an endeavor. It is rather a pioneering work that ought to be taken further in various dimensions. In this section, I discuss my plans to further pursue this project and give general suggestions for future work. I categorize my ideas in the following aspects: design, empirical research, rhetorical analysis, field studies, and multilingual applications.

8.3.1 Future Work on Design

The design of QuikScan does not have an end. More work can be done to explore how QuikScan can be applied to a wider range of document genres and a larger variety of reading contexts. I believe that such explorations are likely to result in significant refinements and adjustments in QuikScan. I'm particularly interested in examining how interactive QuikScan facilitates information consumption online. Take maps for instance: Unkeyed Summaries are usually used to summarize the information on a map in print media. However, digital mapping environment provides plenty of opportunities to extend QuikScan's function to explain targets, objects, and areas on a digital map.

Another area to explore in the future are the design solutions most effective for visually impaired readers. In devising such a design, researchers need to take into consideration of how QuikScan works with text-to-speech software. More work is needed to examine the differences among several major text-to-speech software applications. Researchers could even explore how to integrate QuikScan's features into the system design of these software programs.

In addition, despite the overall conclusion that QuikScan facilitates reading comprehension and information seeking, additional research needs to differentiate design solutions for readers with different goals. For instance, when the audience is expected to be intent on information seeking, it might be wise to have more numbered items in the summaries with each item pointing more specifically to the target location in the main body of text. However, too many numbered items add a layer of complexity to summaries and could potentially reduce the efficiency of information search. These are just some examples of the complex relationship between QuikScan strategies and reading contexts. Future research is needed to investigate the most effective designs for various reading goals and reader characteristics.

8.3.2 Future Work on Empirical Research

There is significant potential for further empirical investigation on the effects of QuikScan. Here I articulate two aspects: areas of investigation and methodologies. First, future research ought to broaden the areas of empirical investigation. I plan to further examine the effects of QuikScan on retention. Data is needed to prove that QuikScan does enhance retention. Also, the dissertation examines the QuikScan

format as a whole. I do not distinguish among the different kinds of signals and their different effects. It would be valuable, for instance, to ascertain the effects of number signaling vs. the effects of summarizing. It is highly doubtful that number signals and summarizing produce the same effect on comprehension and information seeking. I hope to investigate exactly what helps and what does not help and the way each of the QuikScan components facilitates comprehension and information seeking. In addition, the use of QuikScan on Web pages could be empirically examined. Future research should look at whether QuikScan is more desirable in the online environment where users tend to read fast and selectively. I plan to conduct studies to compare reading performances on printed QuikScanned documents and Web-based QuikScanned documents.

Second, a wider variety of methodologies can be used in future research to examine the effect of QuikScan. As I have shown in the literature review, a large variety of qualitative and quantitative methods can be used to investigate information use. This includes but is not limited to focus groups, ethnographical observations, contextual interviews, diaries, eye tracking, and so forth. Different methods represent the traditions of different disciplines. Therefore, I plan to differentiate the value of these methods. For instance, compared to the survey administered in my studies, focus groups offer a much more interactive environment in which rich data can be obtained. Eye tracking can potentially inform us where a reader is looking at when performing information seeking tasks on QuikScanned documents. Usability tests can be conducted to examine the problems readers have with a QuikScanned document. If

conditions permit, I am also interested in using unobtrusive methods to observe how readers interact with QuikScanned documents in their natural environment.

8.3.3 Future Work on Rhetorical Implications

My dissertation provides a comprehensive analysis of the rhetorical implications of QuikScan. To take a step further, researchers need to investigate how a QuikScanner in the real world navigates through the QuikScan process as he or she interacts with target audience virtually or physically. Surveys, interviews, and personal diaries can be used to investigate the complexity of the involvement of the reader. For instance, it is very intriguing to probe how a QuikScanner adheres to the original document and the original author's invoked audience, and how she invokes her own reader image and augments the document. If the real reader (or representatives from the target population) is involved, it is worthwhile to probe the conversations and negotiations between the reader and the QuikScanner and investigate how such interactions shape the evolution of QuikScanned documents.

Another promising methodological framework with which to investigate this dynamic discourse is Activity Theory. Originated in the Soviet Union, Activity Theory is particularly effective in studying the interactions in the workplace (Dayton, 2000). Viewing the QuikScan process as an activity system, further research could investigate how the participants and their interactions in a QuikScanning activity lead to the QuikScanned document and explore the contradictions occurring in this process.

8.3.4 Field Studies

I intend to conduct field studies on the use of QuikScan by meeting attendees

and visually impaired readers. A field study on using QuikScan in meetings should

investigate how QuikScan fits with group dynamics. Research is needed not only to

examine whether or not QuikScan facilitates meeting discussions, but also to address

the group characteristics such as group size, the purpose of the meeting, and so forth.

Although I have presented the results of a pilot study on a blind student (working as a

consultant), research with multiple blind readers will be necessary to draw general

conclusions on the effects of QuikScan for visually impaired readers. A field study is

needed to investigate how visually impaired readers use QuikScan and what design

components they consider desirable, redundant, or disruptive.

8.3.5 QuikScan as a Technical Writing Pedagogy

The professional fields of information design and technical communication are

replenished and strengthened by writing instruction at universities. Indeed, writing

instruction underlies our knowledge-based cultured. Therefore, if there are ways in

which QuikScan can contribute to writing instruction, they should be examined. I have

used QuikScan as a composition aid in my technical writing class and received

enthusiastic responses from students. They mostly agreed that QuikScan helps them

analyze an existing document and enables them to write concisely and plan

well-structured writing.   It seems that QuikScan has a great potential in assisting the

teaching of technical communication. Here, I briefly explain a number of advantages

QuikScan has to offer.

First, the reader-centeredness nature of QuikScan helps students understand the

various ways in which audience participates in the process of writing and in the

production of documents. Nowadays, writing in the professions is increasingly

practiced as a user-centered business process. In writing classes, students could engage

in activities that involve conversations with the real audience in the development of

their writing. Through audience participation, students can experience the dynamic

and iterative process of involving and invoking audience and gain an understanding of

how such interactions shape the evolution of documents. If possible, I intend to use

QuikScan as a pedagogical approach in the writing classes in the Department of

Technical Communication at the University of Washington (UWTC) and in the

Department of English and Philosophy at the University of Wisconsin-Stout, where I

will be teaching starting this fall. Currently, undergraduate technical writing courses at

UWTC largely focus on the mechanics of writing and the pragmatic aspects of

document design and production[26]. Using QuikScan can be an effective way to update

the current curriculum by exposing students to the concepts of author-reader

relationships and these concepts' practical meaningfulness.

Second, practicing QuikScan in composition and technical writing classes can

help students become good readers and good writers. Students walk through the

process of planning, producing, revising, and iterative evaluation. To plan a

QuikScanning activity, students must recognize the goals of stakeholders and needs of

readers. They must identify the gist of an existing document, strategize their use of

summaries and highlighting, and tailor the document toward particular goals and

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[26] One reason is that some courses, particularly TC231 Introduction to Technical Writing and TC 333 Advanced Technical Writing and Oral Presentation, are service courses required for all engineering majors.

needs. Through this exercise, students exercise and develop the skills they need to be effective discourse facilitators between the original document and target audience.

Most activities in our writing classes focus on the writing process, specifically drafting, revising, and peer reviewing. Technical communicators (and QuikScanners), as I have discussed earlier, work in between the originator community and the audience community. This means it is necessary to train students transform a document written for one target reader into a form desirable for a different target reader. Instead of teaching students the general concept of audience analysis, instructors could use QuikScan as a vehicle to help students achieve such a transformation.

Third, QuikScan can be used as an effective way to help students write and organize information clearly. Being able to produce readable and well-structured documents is a skill essential to technical communicators. Summaries and numbered or lettered list items enable students to visualize the structure of their writing and to concretely strategize their presentation to best serve their goals. QuikScan is likely to create an environment in which students must learn to practice concise writing. They must learn to elicit information from an existing document and selectively and logically present content items.

Fourth, since QuikScan is likely to be a collaborative practice, it creates a platform on which students focus their attention on placing summaries, choosing summary formats, writing concise and essential summaries, and analyzing audience (virtual and/or real). When real audiences are involved, students gain the opportunity

to collaboratively interact with one or multiple audiences, once or iteratively. Through this process, students understand that the relationship between the author and the reader, in technical and professional discourse, is not a one-to-one relationship, but a multiple-to-multiple interaction. Experiencing this process prepares students for the workplace where technical writers, web designers, user researchers, stakeholders, and users participate in the production of technical communication.

As I start my career in the academia, I plan to implement QuikScan in my writing classes and study its pedagogical implications. To illustrate my future plans in applying QuikScan, I present a sample syllabus (Appendix O) for using QuikScan in a technical writing class. This syllabus could be considered as a portion of an existing syllabus.

8.3.6 Multilingual Applications

QuikScan was developed in an English language context. Due to cultural differences, the genres of expository writing in different language systems employ different organizational structure. For example, while expository writing in the West tends to be deductive, such writing practices are more inductive in the Chinese context. It is intriguing to investigate how the deductive nature of QuikScan works in a Chinese-language discourse that is typically inductive. Presumably, the effect of QuikScan is more prominent in an inductively structured passage because the superordinate ideas in inductively structured documents are harder to find compared to deductively structured ones. Figure 8.1 represents QuikScan applied on a passage written in Simplified Chinese.

Figure 8.1 A QuikScanned passage in Chinese

8.4   Invitation

From the very beginning of this project, I have had an enduring interest in publicizing QuikScan as an effective tool for writers and readers. QuikScan is non-proprietary and was developed based on Open Source principles.

I encourage writers and editors in corporations, government agencies, media outlets, educational institutions, and non-profit organizations to adopt QuikScan in their document use. I particularly encourage information designers and technical communicators to use and refine QuikScan. I welcome comments and suggestions and would like to hear stories and lessons on the use of QuikScan. I particularly encourage information designers and technical communicators to use and refine QuikScan. In the near future, I plan to continue the QuikScan project and expect to transform portions

of this dissertation into a book and a training course.

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Appendix A: Recruitment Text for Study 1

Opportunity to Earn $20 for Participating in a Research Study

We are conducting a research study and need students who are willing to read a document and answer questions about it. The total time required will be two hours.

This study consists of two sessions. On the first day you will read a document and answer questions concerning the content you have read. This will take about 1 hour, 40 minutes.

You will return one week later for a 20-minute follow-up session in which you will also answer questions. No personal data will be collected.

<u>HOW DO YOU SIGN UP?</u>
Email me (Quan Zhou) at <u>qzhou@u.washington.edu</u> to schedule a session or learn more about the study. I am a Ph.D. student in the UW Department of Technical Communication. I would greatly appreciate your participation!

Appendix B: Instructions for Study 1 (QuikScan Group)

Reading Research Study

Department of Technical Communication
University of Washington

Welcome to the reading research study at the University of Washington. We appreciate your help. Today you are going to read a document, answer some questions about the content of this document, and complete a brief survey on your experience.

Please review the consent form on the next page, and if you decide to continue this study, please sign and date the consent form. Your participation is completely voluntary and you may leave at any time you like. Your privacy will be ensured during the study. We are examining documents, not your reading ability. We will not collect personal data about you.

To help us know a little more about your background, please answer the following question:

Do you consider yourself to be knowledgeable about economics and global trade?

Yes   No

UNIVERSITY OF WASHINGTON CONSENT FORM

A Study on the Effects of
Document Formats on Reading

Investigator: Quan Zhou, Ph.D. student (206-931-0689)
Department of Technical Communication

RESEARCHER'S STATEMENT

We are asking you to be in a research study. The purpose of this consent form is to give you the information you will need to help you decide whether or not to be in the study. Please read the form carefully. You may ask questions about the purpose of the research, what we would ask you to do, the possible risks and benefits, your rights as a volunteer, and anything else about the research or this form that is not clear. When all your questions have been answered, you can decide if you want to be in the study or not. This process is called 'informed consent.'

PURPOSE OF THE STUDY

The purpose of this study is to evaluate the effects of different document formats so that better document design could be implemented to serve the readers.

STUDY PROCEDURES

You will be asked to read an article and then answer questions about the content of the article. You will also be asked to fill out a brief survey about your reading experience.   The total time for this study is around 1.5 hours.

RISK, STRESS, OR DISCOMFORT

This study will not expose its participants to risk, stress, or discomfort beyond that normally associated with any non-graded testing environment.

BENEFITS OF THE STUDY

The results of this study can lead to technique design that can result in more readable documents.

OTHER INFORMATION

The names of individual participants will not be used in the tabulation of the results in order to ensure both anonymity and confidentiality. Performance in the study will in no way affect course grades, nor will anyone have access to data on individuals' performances. Data will be retained by the investigator for no more than one year following the date on which the study is administered. You are free to refuse to participate in the study and may withdraw at any time without penalty.

_____
Signature of Investigator   Date

SUBJECT'S STATEMENT

This study has been explained to me. I volunteer to take part in this research. I have had a chance to ask questions. If I have questions later on about the research I can ask one of the investigators listed above. If I have questions about my rights as a research subject, I can call the Human Subjects Division at (206) 543-0098. I will receive a copy of this consent form.

_____
Signature of Subject   Date

Instructions for this study

You are going to read a report in which you will see a series of numbered "within-document" summaries, placed in various sections of the report. We call this "QuikScan." These numbered summaries are put along the report and they summarize the incoming section until the next summary appears. Please read the following guide to QuikScan.

Guide to QuikScan

QuikScan is a set of techniques that we apply to a document in order to make it faster for you to read. We don't re-write the document. We write a summary in which each part of the summary starts with a number that corresponds to the same number in the main body of text where the summarized item is explained in full. See the following example:

Economic Feasibility of Supplying Redcedar to Manufacturers

> **1}** The government funds extraction.
> **2}** The costs to landowners are almost entirely transportation.
> **3}** These transportation costs should typically be $9.25/ton.

1} Currently landowners can make use of state and federal programs that fully subsidize the cost of extracting or otherwise removing redcedar from their property. **2}** Therefore, the cost to landowners of supplying redcedar to manufacturers consists almost entirely of transportations costs. Transportation costs will vary for each landowner depending upon the vehicle load, distance to the manufacturer, and the costs of gasoline. **3}** Our estimate, however, is that most landowners can deliver round wood or whole-tree redcedar to a manufacturer for approximately $9.25/ton, assuming a 100 mile delivery trip and a no-cargo return trip.

<u>Instructions</u>

During your reading, make the most use of the summaries to help you comprehend the report. Please read the summaries carefully because you will fill out a survey concerning these summaries at the end of today's study.

You have 45 minutes to read the report. Please raise your hand once you are done. Please read it once through carefully. You will answer some questions based on your understanding of the content. Once you begin answering questions, you will not be able to access the document again.

You may be reading in a group of participants. Each of you has different documents, so individuals will have more or less to read. Other participants may leave early or late, depending on the document they get.

Please note that you are not allowed to take notes or communicate with each other during your reading.

If you have questions about the instructions, please ask the moderator.

Please turn to the next page and begin reading.

Appendix C: Instructions for Study 1 (Non-QuikScan Group)

Reading Research Study
Department of Technical Communication
University of Washington

Welcome to the reading research study at the University of Washington. We appreciate your help. Today you are going to read a document, and answer some questions about the content of this document.

Please review the consent form on the next page, and if you decide to continue this study, please sign and date the consent form. Your participation is completely voluntary and you may leave at any time you like. Your privacy will be ensured during the study. We are examining documents, not your reading ability. We will not collect your personal data.

To help us know a little more about your background, please answer the following question:

Do you consider yourself to be knowledgeable about economics and global trade?

Yes   No

UNIVERSITY OF WASHINGTON CONSENT FORM

A Study on the Effects of
Document Formats on Reading

Investigator: Quan Zhou, Ph.D. student (206-931-0689)
Department of Technical Communication

RESEARCHER'S STATEMENT

We are asking you to be in a research study. The purpose of this consent form is to give you the information you will need to help you decide whether or not to be in the study. Please read the form carefully. You may ask questions about the purpose of the research, what we would ask you to do, the possible risks and benefits, your rights as a volunteer, and anything else about the research or this form that is not clear. When all your questions have been answered, you can decide if you want to be in the study or not. This process is called 'informed consent.'

PURPOSE OF THE STUDY

The purpose of this study is to evaluate the effects of different document formats so that better document design could be implemented to serve the readers.

STUDY PROCEDURES

You will be asked to read an article and then answer questions about the content of the article. You will also be asked to fill out a brief survey about your reading experience.   The total time for this study is around 1.5 hours.

RISK, STRESS, OR DISCOMFORT

This study will not expose its participants to risk, stress, or discomfort beyond that normally associated with any non-graded testing environment.

BENEFITS OF THE STUDY

The results of this study can lead to technique design that can result in more readable documents.

OTHER INFORMATION

The names of individual participants will not be used in the tabulation of the results in order to ensure both anonymity and confidentiality. Performance in the study will in no way affect course grades, nor will anyone have access to data on individuals' performances. Data will be retained by the investigator for no more than one year following the date on which the study is administered. You are free to refuse to participate in the study and may withdraw at any time without penalty.

_____
Signature of Investigator   Date

SUBJECT'S STATEMENT

This study has been explained to me. I volunteer to take part in this research. I have had a chance to ask questions. If I have questions later on about the research I can ask one of the investigators listed above. If I have questions about my rights as a research subject, I can call the Human Subjects Division at (206) 543-0098. I will receive a copy of this consent form.

_____
Signature of Subject   Date

Instructions

You are going to read a report starting from the next page. You have 45 minutes to read the report. Please raise your hand once you are done.

Please read it once through carefully. You will answer some questions based on your understanding of the content. Once you begin answering questions, you will not be able to access the document again.

You may be reading in a group of participants. Each of you has different documents, so individuals will have more or less to read. Other participants may leave early or late, depending on the document they get.

Please note that you are not allowed to take notes or communicate with each other during your reading.

If you have questions about the instructions, please ask the moderator.

Please turn to the next page and begin reading.

Appendix D: QuikScan Version of the Text for Study 1 and 2

Trade in the Developing World

1} The exports of developing countries have grown significantly since the early 1990s.

2} A "new geography" of trade has emerged with developing countries finding new markets for their commodities in other developing countries.

3} Progressive multilateral trade liberalization has supported and contributed to this robust trade.

4} This report examines the relationship between trade and growth. Dependence on primary commodity exports is a "trade vulnerability." Being a small island or landlocked country creates a geographical trade vulnerability.

1} Since the early 1990s, growth of exports of developing countries as a whole has been robust. In both the first and second halves of the last decade, the average annual growth of developing-country exports surpassed the growth rate of world exports (12.2 versus 8.7 per cent for 1991-1995 and 7.7 versus 4.8 per cent for 1996-2000). Moreover, this trend continues—with global exports having expanded at an annual rate of 5.8 per cent per year in 2001-2003, compared with a comparable rate of 7.4 per cent for developing countries. A number of developing countries have focused explicitly on encouraging exports and have been remarkably successful with their strategies. **2}** In some instances, this vigorous trade growth has led to what has been termed a "new geography" of trade, with developing countries finding new markets for their commodities in other developing countries.

3} Progressive multilateral trade liberalization has supported this robust trade per-formance. Further multilateral trade liberalization, with a view to generating an equitable outcome to all participants, can contribute to growth and development in developing countries. In fact, the Monterrey Consensus of the International Conference on Financing for Development (United Nations, 2002, annex) acknowledged that "a universal, rule-based, open, non-discriminatory and equitable multilateral trading system, as well as meaningful trade liberalization, can substantially stimulate development worldwide, benefiting countries at all stages of development."

4} This report begins by examining the relationship between trade and growth. It shows that the composition of its trade may affect a country's ability to reap trade gains. In particular, dependence on primary commodity exports adversely influences a country's capacity to benefit from trade and globalization. The second section of the report turns to the discussion of trade "vulnerabilities." Dependence on primary com-

modity exports constitutes one such vulnerability. However, there are also geographical vulnerabilities, particularly those that affect small island developing states and landlocked developing countries. –

Trade, growth and specialization

Between 1981 and 2003, developing countries have increased their share of global trade and have diversified their exports into manufacturing.

Between 1981 and 2003, developing countries increased their share of world exports from 27 to 33 per cent. A concomitant of this expansion was increasing diversification. The export concentration index for developing countries as a whole declined strongly between 1980 and 2003—from nearly 0.6 to about 0.2 (United Nations Conference on Trade and Development, 2004g). Hence, over the past two decades, developing countries have not only increased their share of global trade but, as a group, managed to move beyond their traditional specialization in agricultural and resource-based exports into manufactures.

The overall share of manufactures in developing-country exports, which had stood at 20 per cent in 1980, reached 65 per cent in 2001 and 75 per cent in 2003. Further, the share of high-value-added exports, which consist of manufactures with medium- to high-level skill and technology inputs, increased from 20 to nearly 50 per cent in the period from 1980 to 2003. Both low- and middle-income countries shared in this trend. Moreover, China and India were not the only countries driving these increases. When these two countries are excluded, the share of manufactures increased from 10 to more than 60 per cent of total exports of low-income developing countries in the period from 1980 to 2003.

1} There have been significant regional differences in the increase of manufacturing exports.
2} East Asian economies enjoyed the highest position, Latin America and the Caribbean were intermediate, and Africa was lowest.
3} Least developed countries and small island developing countries still depend on primary non-fuel commodities for over half their export earnings.
4} The reasons why not all developing countries have benefited from the trade boom are excessive dependence on one or two primary products, civil conflict, politically motivated trade embargoes.

1} While the share of manufactures rose in most geographical regions, there have been significant regional differences. **2}** In the East Asian economies, almost 70 per cent of goods exports were manufactures in 2001 and over 80 per cent in 2003. Moreover, the relevant exports were often at the higher end of the value-added chain and many were also globally dynamic goods and services. At the other extreme, the share of manufactures in the exports of goods was only 47 per cent in Africa in 2003, still up from 31 per cent in 2001, and mostly in the area of processed primary commodities—which included exports of food products and preparations, as well as processed chemicals and materials. Latin America and the Caribbean were in an intermediate position, with manufactures accounting for 57 per cent of goods exports in 2001.

This shift away from commodities was important to counterbalance the long-term decline in commodity prices that was experienced during this period. In 2002, the price index of agricultural commodities deflated by the price index of manufactured exports of industrialized economies in United States dollars was half its 1980 value (74 as against 145). **3}** Still, half of all developing countries—mostly least developed countries and small island developing states—continued to be dependent on primary non-fuel commodities for over half their export earnings (United Nations Conference on Trade and Development, 2004h).

4} Not all developing countries participated in this "trade boom." Forty-nine countries experienced negative real growth rates of their merchandise exports over the period in question. Poor performance was attributable to combinations of excessive dependence on one or two primary products (Cameroon on oil, Nauru on phosphates and Zambia on copper), civil conflict (including the Comoros, Rwanda and Timor-Leste) and politically motivated trade embargoes (including the Libyan Arab Jamahiriya and the Sudan).

1} Different developing countries have varied capacity to benefit from world trade.

2} Although export growth of raw primary products has been low, the growth rates for processed agricultural products have been significantly higher.

3} Trade in low-technology manufactures, simple manufactures, iron and steel products, medium-technology manufactures, and high-technology goods grew significantly.

4} The most "dynamic" categories of exports are (a) electronic and electrical goods, (b) chemicals, and (c) miscellaneous manufactures. They are dynamic either because of the absolute increase in market share or the average annual export value growth.

1} A closer look at the dynamics of manufactures in world trade, classified according to their skill contents, reveals also the variable capacity of different developing countries to benefit from them. **2}** Whereas export growth of raw primary products has been relatively low—about 2 per cent per year since 1981—export growth rates for processed agricultural products (such as meats, processed foods, alcoholic beverages, tobacco products and processed woods) have been significantly higher, 6 per cent globally. **3}** Meanwhile, trade in low-technology manufactures (such as textiles and clothing), simple manufactures (such as toys and sporting goods) and iron and steel products grew at rates that were well above the world average and highest of all for low-income developing countries. Similarly, in medium-technology manufactures (such as automobiles and components), growth rates of exports from low- and middle-income developing countries far outstripped comparable growth rates of exports from high-income countries. Meanwhile, exports of high-technology goods (for example, electronic goods, such as computers, televisions and components) grew more than twice as fast as overall world trade; and exports of these products from low-and middle-income countries grew more rapidly still.

4} Over the period 1985-2002, the most "dynamic" exports in world trade fell into three groups: electronic and electrical goods (Standard International Trade Classification (SITC) divisions 75-77); chemicals (SITC section 5) and miscellaneous manufactures (SITC section 8). "Dynamism" can be described in two ways—in terms of either the absolute increase in market share or average annual export value growth. Following the first criterion, four product categories stood out between 1985 and 2002 as belonging to the 40 most dynamic product groups: electronic and electrical goods; chemicals; engines and parts; and textiles and clothing. Following the second benchmark, a number of agricultural and processed foods and beverage items cropped up in the "top 40" (United Nations Conference on Trade and Development, 2004).

1} Despite the dynamic growth of manufacturing exports from developing countries, developed countries enjoy much more of total export value of products involving high research and development.
2} However, some East Asian economies have made significant inroads as suppliers of higher-skill, higher-tech products to world markets.
3} Most developing countries are involved in the low-skill assembly phases of production, which may cause the price of exports to decline.
4} There is an on-going debate on whether liberalization and open trade necessarily benefit growth.
5} Several investigations argued that outward-oriented economies grow faster.
6} However, a growing number of criticism questions this relationship between outwardness and growth speed.
7} Hence, the more specific association between trade liberalization and growth remains largely unproved. This relationship also depends on the pattern of trade specialization of a country.

1} Despite the dynamic growth of manufacturing exports from developing countries, developed countries generally accounted for the lion's share of the total export value of products requiring high research and development (R&D) expenditures and characterized by high technological complexity (SITC section 5 and division 87), the exception being optical instruments. **2}** It was only a limited number of East Asian economies—for example, Malaysia, the Republic of Korea, Singapore and Taiwan Province of China—that made significant inroads as suppliers of higher-skill, higher-tech products to world markets.

3} Most developing countries are thus involved in the low-skill assembly phases of production. Because they have often increased their participation in the labour-intensive segments of production of high-tech goods, the question which arises is whether being engaged in the low-skill assembly stages of the production chain carries the same benefits as the export of more high-skill, high-tech products or whether, to the contrary, a form of "commoditization" is occurring. As an increasing number of developing countries export standardized, labour-intensive commodities, prices are likely to decline, necessitating ever-increasing export volumes.

The importance of these questions lies in the possible ramifications of trade and export expansion for growth. Orthodox economic analysis has argued that trade liberalization has a positive effect on resource allocation and economic growth. The assumptions underlying orthodox theories are perfect competition, full employment of resources, and constant returns to scale in production. However, the real world is more complex— with market imperfections, high levels of unemployment and underemployment and economies of scale in many branches of industrial production worldwide. As notable an economist as Paul Samuelson has questioned the

assumption that liberalization always has a benign outcome. As he pointed out recently (Samuelson, 2004), "it is dead wrong about the necessary surplus of winnings over losings." In reality, unfettered trade liberalization has, at times, imposed heavy adjustment costs including output contraction, higher unemployment and deeper trade deficits (Ocampo and Taylor, 1998). These short-term costs may reverberate and impair the realization of promised long-term gains.

4} From the viewpoint of growth and development, what is important is the ultimate impact of trade liberalization on domestic variables, such as output, employment, wages and investment; but evidence of the influence of trade on the domestic economy is hard to come by. Empirical studies are marred by data problems, by issues of causality and by the difficulties inherent in attempting to quantify social variables. Therefore, there is an ongoing debate as to the nature of the correlation between openness and growth.

5} Since the 1970s, several investigations have found evidence that outward-oriented economies grow faster (among the earlier studies, see Michaely, 1977). The widely known study by Sachs and Warner (1995), which examined the experience of over 100 developed and developing economies from the post-Second World War period to the mid1990s, found a strong association between openness and growth. Within the group of developing countries, per capita GDP in the open economies grew at 4.49 per cent per annum, whereas in the closed economies, it grew at 0.69 per cent per annum. Using comparative data for 93 advanced and developing countries over the period 1980-1990, and nine different estimates of "openness," Edwards (1997) also concluded that, regardless of how openness was defined, "more open countries have indeed experienced faster growth." More recently, an analysis of 73 developing countries indicated that "per capita growth rates have increased among the globalizing economies in the 1990s relative to the 1980s" (Dollar and Kraay, 2001). Recognizing that most of these countries had been engaged in wide-ranging economic reforms, the authors did not attribute all of the improvement in growth to greater openness. They nevertheless give a pivotal role to the fact that the faster growers were "globalizing" that is to say, they maintained that changes in trade volumes had had a strong positive relationship with changes in growth rates.

6} However, a growing number of studies have critiqued these conclusions from a variety of perspectives. In an extensive review of several of the aforementioned studies, Rodriguez and Rodrik (1999) argued that the indicators of openness used by researchers were generally measures of trade performance rather than of trade barriers (and thus of the extent of trade liberalization) or, alternatively, in effect measured other sources of bad economic performance (such as macroeconomic instability) rather than, again, trade liberalization. Indeed, an equally copious literature has shown that there is no association between growth and direct measures of protection (tariffs and non-tariff barriers) and thus that dynamic export performance has taken place

under different trade regimes (United Nations Conference on Trade and Development, 1992; Rodriguez and Rodrik, 1999; Rodrik, 2001; Ocampo and Martin, 2003). Furthermore, the industrial upgrading necessary to spur the export of higher-value-added manufacturing exports does not occur automatically. Rather, it requires other policies, such as the development strategies undertaken in several East Asian economies "to incubate high-tech firms, and to attract high-tech investments by multinational corporations" (Woo, 2004). Another examination of these associations noted that trade liberalization often occurred at the same time as many other reforms, so that identification problems plagued the inference that differences in growth rates were due to differences in trade policy (Nye, Reddy and Watkins, 2002).

7} Thus, while there is growing acceptance of the positive association between export performance and GDP growth, the more specific association between trade liberal-ization and growth remains largely unproved. In several instances, export success has been associated with industrial and other supply-side policies, and even with the coexistence of protectionist and export promotion policies. Indeed, as Chenery, Robinson and Syrquin (1986) pointed out some time ago, the import substitution policies pursued by several countries in the past—even if less relevant today as a strategy—might have been essential in building the supply capacities that were reflected in their later export success. Equally, there appears to be no definitive evidence as to the effects of trade liberalization on employment and wages (Hoekman and Winters, 2005; Lee, 2005). The consensus at this point seems to be that trade liberalization "will create some losers (some even in the long run)" (Winters, 2000). Hence, government intervention may be warranted (Baldwin, 2003).

As some of the data cited earlier implies, the actual strength of the relationship between trade and growth also depends on the pattern of trade specialization of a country. Lowering trade barriers and increasing trade may be the consequence of the pattern of specialization, rather than the cause. According to Birdsall and Hamoudi (2002): "Countries with high natural resources and primary commodities in their exports are not necessarily 'closed' nor have they necessarily chosen to 'participate' more in the global trading system. For them, reducing tariffs and eliminating non-tariff barriers to trade may not lead to growth. In this context, terms like openness, liberalization and globalization are red herrings." In other words, most commodity-dependent countries were not able to raise their trade-to-GDP ratio, whether they cut tariffs steeply or not. Similarly, the majority of the least commodity-dependent countries saw increases in their trade-to-GDP ratio irrespective of any tariff cuts.

Trade Vulnerabilities Regarding Commodities

1} Two features of commodity price trends are important for commodity-dependent developing nations. One is the decline of most non-oil commodity prices. The other is volatile prices.

2} These concerns have lead to domestic interventions and international agreements since the turn of the century. These include international commodity agreements and compensatory financing schemes.

3} International commodity agreements attempted to reduce volatility and stabilize prices. Most contained legally binding economic clauses and specific instruments aimed at balancing supply and demand.

4} Most of these agreements ceased to function during the 1980s and early 1990s. All were assessed as having achieved only limited success.

5} Compensating financing schemes (CFF, STABEX, SYSMIN, and FLEX) are designed to compensate developing countries for temporary shortfalls in earnings from commodity exports. STABEX and SYSMIN have been abandoned. FLEX has been revamped.

1} International commodity policy focuses on the impact on developing countries of heavy dependence on exports of one or a few commodities for the bulk of their foreign-exchange earnings. Two features of commodity price trends are important in this regard. The first is the long-run trend decline in the terms of trade of most non-oil commodity prices when measured against the prices of manufactured goods. This long-term trend had raised the alarm in the 1950s and was the basis of what came to be known as the Prebisch-Singer thesis. Numerous empirical studies have confirmed this thesis in recent decades and analyzed the consequences for developing countries that specialize in commodity exports. The second feature of commodity price trends is reflected in the observation over the years that these price changes can be subject to volatile swings around the long-term trend for a variety of reasons related to unpredictable supply shocks and other market disturbances.

2} These concerns have led to the development of different domestic interventions and international agreements since the early years of the twentieth century. Since the 1950s, under the new umbrella of development cooperation, they gave rise to international commodity agreements (ICAs) and compensatory financing schemes. **3}** International commodity agreements were legally binding intergovernmental agreements between major commodity producers and consumers. Several of them were negotiated and implemented within the framework of the United Nations Conference on Trade and Development (UNCTAD) Integrated Programme for Commodities. These agreements contained economic clauses and specific instruments aimed at balancing supply and demand, and at reducing price volatility in international markets for the benefit of both producers and consumers. International commodity

agreements for sugar, tin, coffee, cocoa and natural rubber operated with stabilization mechanisms at one time or another from the 1970s to the late 1990s. Agreements without economic clauses, which were often established after attempts at price stabilization schemes had failed, served as trade associations aimed at protecting the interests of producing and consuming countries.

Price stabilization instruments were either buffer stocks or export quotas. A buffer stock scheme removed excess supply from the market during periods of low prices—where low prices were understood to be prices falling below some notional assessment of a long-run equilibrium price—by buying and warehousing the commodity until prices increased. An international commodity agreement based on exports quotas controlled the supply-demand balance in global markets much in the same way—though the responsibility for withdrawing the excess supplies to keep within their quota lay with individual surplus countries—and tried to limit price fluctuations to specific price bands within which the commodity was bought and sold.

4} Most international commodity agreements gradually ceased to function as price stabilization mechanisms during the 1980s and early 1990s. All were assessed as having achieved only limited success in securing stable, remunerative prices in international markets (Gilbert, 1987; International Task Force on Commodity Risk Management in Developing Countries (ITF), 1999). International commodity agreements with economic clauses came under additional and persistent criticism by major consuming countries to the effect that such stabilization schemes were "non-market" mechanisms that artificially manipulated prices and interfered with efficient allocation of global commodity resources.

5} Compensating financing schemes are financial mechanisms that have been and can be used to provide counter-cyclical financing to compensate developing countries for temporary shortfalls in earnings from commodity exports. The financing mechanisms were designed to provide loans and grants to qualified recipients so as to partially offset the collapse in export earnings. The most well-known compensatory financing schemes are the Compensatory Financing Facility (CFF) of the International Monetary Fund (IMF)— which was also known as the Compensatory and Contingency Financing Facility (CCFF) for a brief period until the contingency financing element was dropped—and the STABEX, SYSMIN and FLEX facilities of the European Union (EU).

The STABEX and SYSMIN facilities provided compensatory financing to beneficiary African, Caribbean and Pacific (ACP) countries in order to offset losses in earnings from commodity exports to EU. Both facilities were judged as having achieved only limited success in their original objectives by the time they were abandoned at the conclusion of the Lomé IV Convention in 2000. The FLEX facility in the Cotonou Partnership Agreement (the successor agreement to the Lomé Convention) provides

support to beneficiary ACP countries to compensate Governments for the impact on their budgets of export earnings instability from exports of agricultural and mineral commodities. The facility also provides financial support under conditions that extend beyond previous facilities—and is linked less to earnings shortfalls from commodity exports—in cases where losses in export revenues have caused increased public deficits that threatened social and economic reform programmes that were being implemented at the same time. The FLEX scheme is expected to put more emphasis on rewarding commitments to economic reforms and sound economic management and possibly provide financing for price risk-management arrangements.

1} Developing countries had been encouraged to manage price risk with market-based financial instruments and techniques. These are (a) basic forwards, (b) futures and options contracts, and (c) commodity-backed derivatives.

2} Forward contracts provide some (usually short-term) hedge against price risk but are not ideal hedging instruments.

3} Futures and options contracts are better because they are traded on organized international commodity exchanges.

4} Some countries have had success with commodity derivatives.

1} Even before the collapse of the major price stabilization and compensatory schemes, developing countries had been encouraged to use market-based financial instruments and techniques to manage commodity price risk. This strategy involved the use of basic forwards, futures and options contracts and a wide range of commodity-backed derivative financial instruments. These tools were either tailor-made for specific transactions or traded publicly on international commodity exchanges.

2} Forward contracts, which are used extensively by commodity producers in developing countries (usually through brokers and other intermediaries), provide some (usually short-term) hedge against price risk. However, because of these risks of default, and several other reasons discussed in more detail in the specialized literature, forward contracts and similar instruments are generally not considered ideal hedging instruments through which to offset commodity price risk (United Nations Conference on Trade and Development, 1994).

3} Futures and options contracts, on the other hand, are considered better hedging instruments mainly because they are traded on organized international commodity exchanges such as the Chicago Board of Trade, the London Metals Exchange, the New York Mercantile Exchange, the Tokyo Commodity Exchange and commodity exchanges based in developing countries such as Argentina, Brazil, China, India, Malaysia, Singapore, South Africa and Thailand (in contract volume, the world's largest commodity exchange is now in the city of Dalian, China). Commodity exchanges operate with strict rules governing the financial solvency of traders, trading practices, contract settlement terms and other terms and conditions designed to

guarantee and preserve the integrity of market operations. Commodity futures also offer institutional investors and hedge funds additional opportunities for portfolio diversification and hedges against inflation and interest rate changes.

Commodity exporters in developing countries were encouraged to use relatively standard non-speculative risk management techniques such as options and swaps (financial contracts that resemble futures, but are easier to handle in terms of cash flow requirements) to trade away price risk and hedge future export earnings from volatile and unexpected price changes. Non-speculative hedging techniques offset losses from sales of the physical commodity with corresponding gains in futures, options and swap market transactions, and vice versa. In this way, the exporter would be guaranteed a known and predictable return from future sale of the commodity.

4} Several developing countries have independently used commodity derivatives over the years with some degree of success. The majority of commodity exporters, however, especially poor least developed countries in Africa, lack the institutional capacity or face considerable obstacles with respect to trading in commodity derivatives. UNCTAD studies have reported on successful and extensive use of futures markets and other commodity derivatives by countries such as Brazil, Chile, Colombia, Costa Rica, Indonesia, Malaysia, Mexico, Papua New Guinea and Venezuela to manage commodity price risk and hedge export revenues, import costs and government budget revenues.

In Africa, the use of commodity derivatives is less widespread. Côte d'Ivoire and Ghana have in the past used forward contracts extensively in their cocoa export trade, and other West African countries for cotton exports (Commission for Africa, 2005, p. 266). Maize is traded in regional markets through the Johannesburg Stock Exchange (which has absorbed the South African Futures Exchange) but Africa so far lacks a major international commodity exchange that caters to regional or global commodity trade.

> **1}** The International Task Force on Commodity Risk Management in Developing Countries recommended the adoption of specially designed risk management instruments and trading techniques. They are user-friendly and provide insurance cover for commodity exporters.
>
> **2}** Also, the concept of risk has been broadened to include such factors as weather, civil and political strife, and armed conflict.

1} Commodity risk management techniques started receiving much greater attention in international development assistance policies after the release of a report in 1999 by the International Task Force on Commodity Risk Management in Developing Countries that had been convened by the World Bank. The Task Force, which comprised representatives and experts in commodity markets and financial institutions drawn from a wide cross-section of international organizations, the private sector, the academic community and independent experts, recommended the adoption of specially designed risk management instruments and trading techniques, which were cautiously presented as user-friendly financial instruments that would provide insurance cover for commodity exporters.

The Task Force compiled a large list of bottlenecks, obstacles and unanticipated difficulties of implementing its 1999 proposals after a series of pilot projects in several developing countries. Severe limiting factors on both the demand and supply sides pointed to the weak financial institutional structures in most countries, and lack of knowledge and skills in trading sophisticated financial instruments. Moreover, despite the known benefits of transactional hedging techniques, many countries viewed trade in commodity derivatives as risky and speculative because of highly publicized accounts of massive fraud and mismanagement of derivatives trade on commodity exchanges in the 1980s and 1990s.

There was also a strong need for simple derivative instruments that would be easily understood by both buyers and sellers, which was a requirement that proved difficult to implement because simpler instruments could not provide the required protection from all price risk. A "simple" forward or futures contract, for example, might have to be hedged further with offsetting options contracts that could significantly increase the complexity of the entire transaction. From the point of view of the large international commodity risk management intermediaries, the regulatory framework and reporting requirements would make it costly and cumbersome to work with large numbers of developing countries.

2} Some commodity producers/exporters were more concerned about volume and revenue risk than price risk. Output volumes could fluctuate widely depending on vagaries of the weather, civil and political strife, armed conflict and a wide range of other unanticipated events in the domestic and global economies that could severely affect agricultural and mining output and sales. The concept of commodity risk, along

with the development of appropriate market-based instruments to cope with such risks, has been broadened correspondingly to include weather-related risks as well as risks of volatile price swings in import prices for food and crude oil.

> **1}** A group of eminent persons meeting under UNCTAD auspices outlined a broader and more comprehensive agenda to address the vulnerabilities of commodity-dependent exporters.
> **2}** The group's highest priority is to give developing countries improved access to primary commodity markets in developed countries.
> **3}** For countries whose export earnings come largely from the extractive industries in the hydrocarbons and mining sectors, an important element of international commodity policy will be policies that promote the effective and transparent management of fiscal revenues.

1} While acknowledging the usefulness of market-based risk management strategies in setting price floors for commodity producers, a group of eminent persons on commodity issues meeting under UNCTAD auspices in 2003 outlined a broader and more comprehensive agenda to address the problems and vulnerabilities of commodity-dependent exporters stemming from severe price erosion and adverse terms-of-trade developments (United Nations Conference on Trade and Development, 2003f). The recommendations of the group contained specific proposals for short- and medium-term actions in the international community that would improve the development prospects of commodity-dependent countries.

2} The highest priority among the group's recommendations was given to measures that
give developing countries improved accessed to primary commodity markets in developed-country markets, including through the elimination of market-distorting subsidies for cotton and other commodities; reduction of excess supply in some commodity markets and increased use of more flexible compensatory financing schemes to mitigate the adverse impact of export earnings shortfalls owing to the erosion of commodity prices. The recommendations called for closer considerations of export earnings potential in debt sustainability analyses and debt relief and longer-term measures to promote economic diversification in commodity-dependent countries. Further elaboration of current international commodity policy was contained in the São Paulo Consensus, adopted by UNCTAD at its eleventh session on 18 June 2004, which resolved to establish the International Task Force on Commodities involving all stakeholders dealing in the production and trade of commodities to conduct a comprehensive review of commodity issues and solutions to existing problems.

3} For countries that will continue to derive a large proportion of export earnings from extractive industries in the hydrocarbons and mining sectors, an important element of

international commodity policy will be the adoption of appropriate policies to promote effective and transparent management of fiscal revenues. IMF publishes fiscal transparency reports containing assessments of country practices for nearly 70 countries which were drawn up according to a Code of Good Practices on Fiscal Transparency that was first adopted in April 1998. The need for fiscal transparency was further underscored following the introduction of the Extractive Industries Transparency Initiative (EITI) which had been launched at the World Summit on Sustainable Development held in Johannesburg, South Africa, from 26 August to 4 September 2002.

Appendix E: Non-QuikScan Version of the Text for Study 1 and 2

Trade in the Developing World

Since the early 1990s, growth of exports of developing countries as a whole has been robust. In both the first and second halves of the last decade, the average annual growth of developing-country exports surpassed the growth rate of world exports (12.2 versus 8.7 per cent for 1991-1995 and 7.7 versus 4.8 per cent for 1996-2000). Moreover, this trend continues—with global exports having expanded at an annual rate of 5.8 per cent per year in 2001-2003, compared with a comparable rate of 7.4 per cent for developing countries. A number of developing countries have focused explicitly on encouraging exports and have been remarkably successful with their strategies. In some instances, this vigorous trade growth has led to what has been termed a "new geography" of trade, with developing countries finding new markets for their commodities in other developing countries.

Progressive multilateral trade liberalization has supported this robust trade performance. Further multilateral trade liberalization, with a view to generating an equitable outcome to all participants, can contribute to growth and development in developing countries. In fact, the Monterrey Consensus of the International Conference on Financing for Development (United Nations, 2002, annex) acknowledged that "a universal, rule-based, open, non-discriminatory and equitable multilateral trading system, as well as meaningful trade liberalization, can substantially stimulate development worldwide, benefiting countries at all stages of development."

This report begins by examining the relationship between trade and growth. It shows that the composition of its trade may affect a country's ability to reap trade gains. In particular, dependence on primary commodity exports adversely influences a country's capacity to benefit from trade and globalization. The second section of the report turns to the discussion of trade "vulnerabilities." Dependence on primary commodity exports constitutes one such vulnerability. However, there are also geographical vulnerabilities, particularly those that affect small island developing states and landlocked developing countries. ‒

Trade, growth and specialization

Between 1981 and 2003, developing countries increased their share of world exports from 27 to 33 per cent. A concomitant of this expansion was increasing diversification. The export concentration index for developing countries as a whole declined strongly between 1980 and 2003—from nearly 0.6 to about 0.2 (United Nations Conference on Trade and Development, 2004g). Hence, over the past two decades, developing countries have not only increased their share of global trade but, as a group, managed to move beyond their traditional specialization in agricultural and resource-based exports into manufactures.

The overall share of manufactures in developing-country exports, which had stood at 20 per cent in 1980, reached 65 per cent in 2001 and 75 per cent in 2003. Further, the share of high-value-added exports, which consist of manufactures with medium- to high-level skill and technology inputs, increased from 20 to nearly 50 per cent in the period from 1980 to 2003. Both low- and middle-income countries shared in this trend. Moreover, China and India were not the only countries driving these increases. When these two countries are excluded, the share of manufactures increased from 10 to more than 60 per cent of total exports of low-income developing countries in the period from 1980 to 2003.

While the share of manufactures rose in most geographical regions, there have been significant regional differences.   In the East Asian economies, almost 70 per cent of goods exports were manufactures in 2001 and over 80 per cent in 2003. Moreover, the relevant exports were often at the higher end of the value-added chain and many were also globally dynamic goods and services. At the other extreme, the share of manufactures in the exports of goods was only 47 per cent in Africa in 2003, still up from 31 per cent in 2001, and mostly in the area of processed primary commodities—which included exports of food products and preparations, as well as processed chemicals and materials. Latin America and the Caribbean were in an intermediate position, with manufactures accounting for 57 per cent of goods exports in 2001.

This shift away from commodities was important to counterbalance the long-term decline in commodity prices that was experienced during this period. In 2002, the price index of agricultural commodities deflated by the price index of manufactured exports of industrialized economies in United States dollars was half its 1980 value (74 as against 145).   Still, half of all developing countries—mostly least developed countries and small island developing states—continued to be dependent on primary non-fuel commodities for over half their export earnings (United Nations Conference on Trade and Development, 2004h).

Not all developing countries participated in this "trade boom." Forty-nine countries experienced negative real growth rates of their merchandise exports over the period in

question. Poor performance was attributable to combinations of excessive dependence on one or two primary products (Cameroon on oil, Nauru on phosphates and Zambia on copper), civil conflict (including the Comoros, Rwanda and Timor-Leste) and politically motivated trade embargoes (including the Libyan Arab Jamahiriya and the Sudan).

A closer look at the dynamics of manufactures in world trade, classified according to their skill contents, reveals also the variable capacity of different developing countries to benefit from them. Whereas export growth of raw primary products has been relatively low—about 2 per cent per year since 1981—export growth rates for processed agricultural products (such as meats, processed foods, alcoholic beverages, tobacco products and processed woods) have been significantly higher, 6 per cent globally. Meanwhile, trade in low-technology manufactures (such as textiles and clothing), simple manufactures (such as toys and sporting goods) and iron and steel products grew at rates that were well above the world average and highest of all for low-income developing countries. Similarly, in medium-technology manufactures (such as automobiles and components), growth rates of exports from low- and middle-income developing countries far outstripped comparable growth rates of exports from high-income countries. Meanwhile, exports of high-technology goods (for example, electronic goods, such as computers, televisions and components) grew more than twice as fast as overall world trade; and exports of these products from low-and middle-income countries grew more rapidly still.

Over the period 1985-2002, the most "dynamic" exports in world trade fell into three groups: electronic and electrical goods (Standard International Trade Classification (SITC) divisions 75-77); chemicals (SITC section 5) and miscellaneous manufactures (SITC section 8). "Dynamism" can be described in two ways—in terms of either the absolute increase in market share or average annual export value growth. Following the first criterion, four product categories stood out between 1985 and 2002 as belonging to the 40 most dynamic product groups: electronic and electrical goods; chemicals; engines and parts; and textiles and clothing. Following the second benchmark, a number of agricultural and processed foods and beverage items cropped up in the "top 40" (United Nations Conference on Trade and Development, 2004).

Despite the dynamic growth of manufacturing exports from developing countries, developed countries generally accounted for the lion's share of the total export value of products requiring high research and development (R&D) expenditures and characterized by high technological complexity (SITC section 5 and division 87), the exception being optical instruments. It was only a limited number of East Asian economies—for example, Malaysia, the Republic of Korea, Singapore and Taiwan Province of China—that made significant inroads as suppliers of higher-skill, higher-tech products to world markets.

Most developing countries are thus involved in the low-skill assembly phases of production. Because they have often increased their participation in the labour-intensive segments of production of high-tech goods, the question which arises is whether being engaged in the low-skill assembly stages of the production chain carries the same benefits as the export of more high-skill, high-tech products or whether, to the contrary, a form of "commoditization" is occurring. As an increasing number of developing countries export standardized, labour-intensive commodities, prices are likely to decline, necessitating ever-increasing export volumes.

The importance of these questions lies in the possible ramifications of trade and export expansion for growth. Orthodox economic analysis has argued that trade liberalization has a positive effect on resource allocation and economic growth. The assumptions underlying orthodox theories are perfect competition, full employment of resources, and constant returns to scale in production. However, the real world is more complex— with market imperfections, high levels of unemployment and underemployment and economies of scale in many branches of industrial production worldwide. As notable an economist as Paul Samuelson has questioned the assumption that liberalization always has a benign outcome. As he pointed out recently (Samuelson, 2004), "it is dead wrong about the necessary surplus of winnings over losings." In reality, unfettered trade liberalization has, at times, imposed heavy adjustment costs including output contraction, higher unemployment and deeper trade deficits (Ocampo and Taylor, 1998). These short-term costs may reverberate and impair the realization of promised long-term gains.

From the viewpoint of growth and development, what is important is the ultimate impact of trade liberalization on domestic variables, such as output, employment, wages and investment; but evidence of the influence of trade on the domestic economy is hard to come by. Empirical studies are marred by data problems, by issues of causality and by the difficulties inherent in attempting to quantify social variables. Therefore, there is an ongoing debate as to the nature of the correlation between openness and growth.

Since the 1970s, several investigations have found evidence that outward-oriented economies grow faster (among the earlier studies, see Michaely, 1977). The widely known study by Sachs and Warner (1995), which examined the experience of over 100 developed and developing economies from the post-Second World War period to the mid1990s, found a strong association between openness and growth. Within the group of developing countries, per capita GDP in the open economies grew at 4.49 per cent per annum, whereas in the closed economies, it grew at 0.69 per cent per annum. Using comparative data for 93 advanced and developing countries over the period 1980-1990, and nine different estimates of "openness," Edwards (1997) also concluded that, regardless of how openness was defined, "more open countries have indeed experienced faster growth." More recently, an analysis of 73 developing

countries indicated that "per capita growth rates have increased among the globalizing economies in the 1990s relative to the 1980s" (Dollar and Kraay, 2001). Recognizing that most of these countries had been engaged in wide-ranging economic reforms, the authors did not attribute all of the improvement in growth to greater openness. They nevertheless give a pivotal role to the fact that the faster growers were "globalizing" that is to say, they maintained that changes in trade volumes had had a strong positive relationship with changes in growth rates.

However, a growing number of studies have critiqued these conclusions from a variety of perspectives. In an extensive review of several of the aforementioned studies, Rodriguez and Rodrik (1999) argued that the indicators of openness used by researchers were generally measures of trade performance rather than of trade barriers (and thus of the extent of trade liberalization) or, alternatively, in effect measured other sources of bad economic performance (such as macroeconomic instability) rather than, again, trade liberalization. Indeed, an equally copious literature has shown that there is no association between growth and direct measures of protection (tariffs and non-tariff barriers) and thus that dynamic export performance has taken place under different trade regimes (United Nations Conference on Trade and Development, 1992; Rodriguez and Rodrik, 1999; Rodrik, 2001; Ocampo and Martin, 2003). Furthermore, the industrial upgrading necessary to spur the export of higher-value-added manufacturing exports does not occur automatically. Rather, it requires other policies, such as the development strategies undertaken in several East Asian economies "to incubate high-tech firms, and to attract high-tech investments by multinational corporations" (Woo, 2004). Another examination of these associations noted that trade liberalization often occurred at the same time as many other reforms, so that identification problems plagued the inference that differences in growth rates were due to differences in trade policy (Nye, Reddy and Watkins, 2002).

Thus, while there is growing acceptance of the positive association between export performance and GDP growth, the more specific association between trade liberalization and growth remains largely unproved. In several instances, export success has been associated with industrial and other supply-side policies, and even with the coexistence of protectionist and export promotion policies. Indeed, as Chenery, Robinson and Syrquin (1986) pointed out some time ago, the import substitution policies pursued by several countries in the past—even if less relevant today as a strategy—might have been essential in building the supply capacities that were reflected in their later export success. Equally, there appears to be no definitive evidence as to the effects of trade liberalization on employment and wages (Hoekman and Winters, 2005; Lee, 2005). The consensus at this point seems to be that trade liberalization "will create some losers (some even in the long run)" (Winters, 2000). Hence, government intervention may be warranted (Baldwin, 2003).

As some of the data cited earlier implies, the actual strength of the relationship

between trade and growth also depends on the pattern of trade specialization of a country. Lowering trade barriers and increasing trade may be the consequence of the pattern of specialization, rather than the cause. According to Birdsall and Hamoudi (2002): "Countries with high natural resources and primary commodities in their exports are not necessarily 'closed' nor have they necessarily chosen to 'participate' more in the global trading system. For them, reducing tariffs and eliminating non-tariff barriers to trade may not lead to growth. In this context, terms like openness, liberalization and globalization are red herrings." In other words, most commodity-dependent countries were not able to raise their trade-to-GDP ratio, whether they cut tariffs steeply or not. Similarly, the majority of the least commodity-dependent countries saw increases in their trade-to-GDP ratio irrespective of any tariff cuts.

Trade Vulnerabilities Regarding Commodities

International commodity policy focuses on the impact on developing countries of heavy dependence on exports of one or a few commodities for the bulk of their foreign-exchange earnings. Two features of commodity price trends are important in this regard. The first is the long-run trend decline in the terms of trade of most non-oil commodity prices when measured against the prices of manufactured goods. This long-term trend had raised the alarm in the 1950s and was the basis of what came to be known as the Prebisch-Singer thesis. Numerous empirical studies have confirmed this thesis in recent decades and analyzed the consequences for developing countries that specialize in commodity exports. The second feature of commodity price trends is reflected in the observation over the years that these price changes can be subject to volatile swings around the long-term trend for a variety of reasons related to unpredictable supply shocks and other market disturbances.

These concerns have led to the development of different domestic interventions and international agreements since the early years of the twentieth century. Since the 1950s, under the new umbrella of development cooperation, they gave rise to international commodity agreements (ICAs) and compensatory financing schemes. International commodity agreements were legally binding intergovernmental agreements between major commodity producers and consumers. Several of them were negotiated and implemented within the framework of the United Nations Conference on Trade and Development (UNCTAD) Integrated Programme for Commodities. These agreements contained economic clauses and specific instruments aimed at balancing supply and demand, and at reducing price volatility in international markets for the benefit of both producers and consumers. International commodity agreements for sugar, tin, coffee, cocoa and natural rubber operated with stabilization mechanisms at one time or another from the 1970s to the late 1990s. Agreements without economic clauses, which were often established after attempts at price stabilization schemes had failed, served as trade associations aimed at protecting the

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Most international commodity agreements gradually ceased to function as price stabilization mechanisms during the 1980s and early 1990s. All were assessed as having achieved only limited success in securing stable, remunerative prices in international markets (Gilbert, 1987; International Task Force on Commodity Risk Management in Developing Countries (ITF), 1999). International commodity agreements with economic clauses came under additional and persistent criticism by major consuming countries to the effect that such stabilization schemes were "non-market" mechanisms that artificially manipulated prices and interfered with efficient allocation of global commodity resources.

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exports—in cases where losses in export revenues have caused increased public deficits that threatened social and economic reform programmes that were being implemented at the same time. The FLEX scheme is expected to put more emphasis on rewarding commitments to economic reforms and sound economic management and possibly provide financing for price risk-management arrangements.

Even before the collapse of the major price stabilization and compensatory schemes, developing countries had been encouraged to use market-based financial instruments and techniques to manage commodity price risk. This strategy involved the use of basic forwards, futures and options contracts and a wide range of commodity-backed derivative financial instruments. These tools were either tailor-made for specific transactions or traded publicly on international commodity exchanges.

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be hedged further with offsetting options contracts that could significantly increase the complexity of the entire transaction. From the point of view of the large international commodity risk management intermediaries, the regulatory framework and reporting requirements would make it costly and cumbersome to work with large numbers of developing countries.

Some commodity producers/exporters were more concerned about volume and revenue risk than price risk. Output volumes could fluctuate widely depending on vagaries of the weather, civil and political strife, armed conflict and a wide range of other unanticipated events in the domestic and global economies that could severely affect agricultural and mining output and sales. The concept of commodity risk, along with the development of appropriate market-based instruments to cope with such risks, has been broadened correspondingly to include weather-related risks as well as risks of volatile price swings in import prices for food and crude oil.

While acknowledging the usefulness of market-based risk management strategies in setting price floors for commodity producers, a group of eminent persons on commodity issues meeting under UNCTAD auspices in 2003 outlined a broader and more comprehensive agenda to address the problems and vulnerabilities of commodity-dependent exporters stemming from severe price erosion and adverse terms-of-trade developments (United Nations Conference on Trade and Development, 2003f). The recommendations of the group contained specific proposals for short- and medium-term actions in the international community that would improve the development prospects of commodity-dependent countries.

The highest priority among the group's recommendations was given to measures that give developing countries improved accessed to primary commodity markets in developed-country markets, including through the elimination of market-distorting subsidies for cotton and other commodities; reduction of excess supply in some commodity markets and increased use of more flexible compensatory financing schemes to mitigate the adverse impact of export earnings shortfalls owing to the erosion of commodity prices. The recommendations called for closer considerations of export earnings potential in debt sustainability analyses and debt relief and longer-term measures to promote economic diversification in commodity-dependent countries. Further elaboration of current international commodity policy was contained in the São Paulo Consensus, adopted by UNCTAD at its eleventh session on 18 June 2004, which resolved to establish the International Task Force on Commodities involving all stakeholders dealing in the production and trade of commodities to conduct a comprehensive review of commodity issues and solutions to existing problems.

For countries that will continue to derive a large proportion of export earnings from extractive industries in the hydrocarbons and mining sectors, an important element of

international commodity policy will be the adoption of appropriate policies to promote effective and transparent management of fiscal revenues. IMF publishes fiscal transparency reports containing assessments of country practices for nearly 70 countries which were drawn up according to a Code of Good Practices on Fiscal Transparency that was first adopted in April 1998. The need for fiscal transparency was further underscored following the introduction of the Extractive Industries Transparency Initiative (EITI) which had been launched at the World Summit on Sustainable Development held in Johannesburg, South Africa, from 26 August to 4 September 2002.

Appendix F: Comprehension Questionnaire for Study 1

Instructions

Please answer the following multiple choice questions. If you absolutely don't know, please mark "I don't know." The questions are difficult. Please answer them carefully. Once you move to the next question, you cannot go back to change answers. When you are done with questions, raise your hand.

Please choose only one correct answer for each of the following questions.

1. **According to the report, which of the following is a major factor contributing to trade vulnerability?**

A. I don't know

B. Geographic location

C. Technology penetration

D. Strength or weakness of democratic institutions

E. Diversity of manufacturing

2. **According to the report, which of the following best describes the growth rates for processed agricultural products?**

A. I don't know

B. Growth rates have been low

C. Growth rates have been high

D. Growth rates have been masked by other trade factors

E. Growth rates have been inconsistent

3. **The authors of the report appear to believe which of the following positions?**

A. I don't know

B. Trade liberalization promotes economic growth. The challenge is now to get appropriate policies in place

C. Uncontrolled trade liberalization is not related to deeper trade deficits

D. Eliminating non-tariff barriers to trade lead to growth for countries with high natural resources

E. It is unclear whether trade liberalization promotes economic growth

4. **What does the Prebisch-Singer thesis pertain to?**

A. I don't know

B. The inevitable failure of international trade agreements

C. The inevitable transition to a free-market economy

D. The inevitable failure of all commodity stability mechanisms

F. The inevitable decline of non-oil commodity prices

5. **Which of the following is a major theme in the report?**

A. I don't know

B. The advantage of developing over developed countries in regard to trade is "dynamism"

C. During the past 10 years global trade has been a rising tide raising all developing countries in Asia to similar levels

D. Developing countries differ greatly in regard to how they participate in and benefit from global trade

E. Developed nations constitute one unitary block in regard to global trade; developing nations constitute another. The significant issues stem from the differences between these two blocks

6. According to the report, what does the Monterrey Consensus of the International Conference on Financing for Development acknowledge?

A. I don't know

B. A non-discriminatory multilateral trading system can help stimulate development worldwide

C. A non-discriminatory multilateral trading system will not benefit developing countries

D. A non-discriminatory multilateral trading system will enhance democracy

E. A non-discriminatory multilateral trading system is harmful to developed countries

7. Which of the following is NOT a strategy used by developing countries to manage commodity price risks?

A. I don't know

B. Futures and options contracts

C. ICA options contracts

D. Commodity-backed derivative financial instruments

E. Forward contracts

8. The Compensatory Financing Facility (CFF) was a compensatory financing scheme developed by which of the following:

A. I don't know

B. The Arab League

C. The International Monetary Fund (IMF)

D. The European Union (EU)

E. The World Trade Organization

9. According to the report, which of the following will help make commodity-backed derivatives a more successful strategy for developing countries:

A. I don't know

B. Providing insurance for exporters

C. Preventing price manipulation

D. Ensuring equitable return on capital

E. Reducing a nation's dependence on the extractive industries for world trade

10. For countries that will continue to derive a large proportion of export earnings from extractive industries in the hydrocarbons and mining sectors, an important element of international commodity policy will be:

A. I don't know

B. The adoption of appropriate policies to promote complete market economy

C. The adoption of appropriate policies to promote effective and transparent management of fiscal revenues

D. The expansion of foreign investments

E. The adoption of strategies such as forward contracts, futures and option contracts, etc.

11. On which of the following do the authors of the report agree?

A. I don't know

B. There is a dynamic absolute increase in market share for a number of agricultural and processed foods and beverages items

C. Automobile engines are not part of the most "dynamic" exports in world trade over the past two decades

D. Products like computers and televisions witnessed a dynamic absolute increase in market share

E. There is a dynamic absolute increase in market share for steel and iron

12. According to the report, which of the following is true of commodity derivatives?

A. I don't know

B. Lack of institutional capacity hinders the use of commodity derivatives

C. The majority of developing countries have used commodity derivatives with some degree of success

D. The use of commodity derivatives is least widespread in Middle East countries

E. The use of commodity derivatives is unlikely in countries without democratic traditions

13. The authors of the report agree which one of the following statements about international commodity agreements?

A. I don't know

B. Most international commodity agreements have been benefiting developing countries

C. International commodity agreements have achieved much success in securing stable, remunerative prices in international markets

D. International commodity agreements with economic clauses have come under criticism

E. International commodity agreements lead to more efficient allocation of global commodity resources

14. According to the report, what did economist Paul Samuelson point out:

A. I don't know

B. Liberalization does not always have a benign outcome

C. Free trade primarily benefits resource-rich countries

D. Liberalization promotes growth in developing countries

E. Unfettered trade liberalization is not related to deeper trade deficits

15. According to the report, which of these relationships between the quantity of exports and diversification of exports is true?

A. I don't know

B. Developed countries have retained their level of diversity while developing countries have increased their level of diversity

C. Developed countries have increased their level of diversity and developing countries have also increased their level of diversity

D. Developed countries have increased their level of diversity while developing countries have decreased their level of diversity

E. Developed countries have retained their level of diversity while developing countries have decreased their level of diversity

16. According to the report, which of the following is true of developing countries?

A. I don't know

B. The export of standardized labour-intensive manufactured commodities is likely to lower the price of these exports

C. The export of standardized labour-intensive manufactured commodities is likely to create trade competition with developed countries

D. The export of standardized labour-intensive manufactured commodities is likely to slow efforts to develop and export high-skill, high-tech products

E. The export of standardized labour-intensive manufactured commodities is highly unlikely for landlocked developing countries

17. A key idea running through this report is:

A. I don't know

B. The world is running out of hydocarbons

C. Attempts to regulate commodity prices are unlikely to succeed

D. International trade encourages the development of democracy

E. Nations in colder climates tend to develop more wealth

When you finish, please raise your hand.

Appendix G: Retention Questionnaire for Study 1

<u>Instructions</u>

The following multiple choice questions are based on the article you read a week ago. Please use your memory and understanding of the article as much as possible to answer them.

If you absolutely don't know, please mark "I don't know." The questions are difficult. Please answer them carefully. Once you move to the next question, you cannot go back to change answers. When you are done with questions, raise your hand.

Please choose only one correct answer for each of the following questions.

1. **A key idea running through this report is:**

A. I don't know

B. The world is running out of hydocarbons

C. International trade encourages the development of democracy

D. Attempts to regulate commodity prices are unlikely to succeed

E. Nations in colder climates tend to develop more wealth

2. **The authors of the report appear to believe which of the following positions?**

A. I don't know

B. It is unclear whether trade liberalization promotes economic growth

C. Trade liberalization promotes economic growth. The challenge is now to get appropriate policies in place

D. Uncontrolled trade liberalization is not related to deeper trade deficits

E. Eliminating non-tariff barriers to trade lead to growth for countries with high natural resources

3. According to the report, which of the following is a major factor contributing to trade vulnerability?

A. I don't know

B. Strength or weakness of democratic institutions

C. Technology penetration

D. Geographic location

E. Diversity of manufacturing

4. Which of the following is a major theme in the report?

A. I don't know

B.   The advantage of developing over developed countries in regard to trade is "dynamism"

C. During the past 10 years global trade has been a rising tide raising all developing countries in Asia to similar levels

D. Developed nations constitute one unitary block in regard to global trade; developing nations constitute another. The significant issues stem from the differences between these two blocks

E. Developing countries differ greatly in regard to how they participate in and benefit from global trade

5. According to the report, which of the following best describes the growth rates for processed agricultural products?

A. I don't know

B. Growth rates have been low

C. Growth rates have been high

D. Growth rates have been masked by other trade factors

E. Growth rates have been inconsistent

6. **What does the Prebisch-Singer thesis pertain to?**

A. I don't know

B. The inevitable decline of non-oil commodity prices

C. The inevitable transition to a free-market economy

D. The inevitable failure of all commodity stability mechanisms

E. The inevitable failure of international trade agreements

7. **According to the report, what does the Monterrey Consensus of the International Conference on Financing for Development acknowledge?**

A. I don't know.

B. A non-discriminatory multilateral trading system will not benefit developing countries.

C. A non-discriminatory multilateral trading system can help stimulate development worldwide.

D. A non-discriminatory multilateral trading system will enhance democracy

E. A non-discriminatory multilateral trading system is harmful to developed countries.

8. Which of the following is NOT a strategy used by developing countries to manage commodity price risks?

A. I don't know

B.   Commodity-backed derivative financial instruments

C. Futures and options contracts

D. ICA options contracts

E. Forward contracts

9. The Compensatory Financing Facility (CFF) was a compensatory financing scheme developed by which of the following:

A. I don't know

B. The Arab League

C. The European Union (EU)

D. The International Monetary Fund (IMF)

E. The World Trade Organization

10. For countries that will continue to derive a large proportion of export earnings from extractive industries in the hydrocarbons and mining sectors, an important element of international commodity policy will be:

A. I don't know

B. The adoption of appropriate policies to promote complete market economy

C. The adoption of strategies such as forward contracts, futures and option contracts, etc.

D. The expansion of foreign investments

E. The adoption of appropriate policies to promote effective and transparent management of fiscal revenues

11. On which of the following do the authors of the report agree?

A.   I don't know

B. Products like computers and televisions witnessed a dynamic absolute increase in market share

C. There is a dynamic absolute increase in market share for a number of agricultural and processed foods and beverages items

D. Automobile engines are not part of the most "dynamic" exports in world trade over the past two decades

E. There is a dynamic absolute increase in market share for steel and iron

12. According to the report, which of the following will help make commodity-backed derivatives a more successful strategy for developing countries:

A. I don't know

B. Preventing price manipulation

C. Providing insurance for exporters

D. Ensuring equitable return on capital

E. Reducing a nation's dependence on the extractive industries for world trade

13. According to the report, which of the following is true of commodity derivatives?

A. I don't know

B. The use of commodity derivatives is unlikely in countries without democratic traditions

C.   The use of commodity derivatives is least widespread in Middle East countries

D. The majority of developing countries have used commodity derivatives with some degree of success

E. Lack of institutional capacity hinders the use of commodity derivatives

14. The authors of the report agree which one of the following statements about international commodity agreements?

A. I don't know

B. Most international commodity agreements have been benefiting developing countries

C. International commodity agreements have achieved much success in securing stable, remunerative prices in international markets

D. International commodity agreements with economic clauses have come under criticism

E. International commodity agreements lead to more efficient allocation of global commodity resources

15. According to the report, which of the following is true of developing countries?

A. I don't know

B. The export of standardized labour-intensive manufactured commodities is likely to create trade competition with developed countries

C. The export of standardized labour-intensive manufactured commodities is likely to lower the price of these exports

D. The export of standardized labour-intensive manufactured commodities is likely to slow efforts to develop and export high-skill, high-tech products

E. The export of standardized labour-intensive manufactured commodities is highly unlikely for landlocked developing countries

16. According to the report, what did economist Paul Samuelson point out:

A. I don't know

B. Liberalization promotes growth in developing countries

C. Free trade primarily benefits resource-rich countries

D. Liberalization does not always have a benign outcome

E. Unfettered trade liberalization is not related to deeper trade deficits

17. According to the report, which of these relationships between the quantity of exports and diversification of exports is true?

A. I don't know

B. Developed countries have retained their level of diversity while developing countries have increased their level of diversity

C. Developed countries have increased their level of diversity and developing countries have also increased their level of diversity

D. Developed countries have increased their level of diversity while developing countries have decreased their level of diversity

E. Developed countries have retained their level of diversity while developing countries have decreased their level of diversity

When you finish, please raise your hand.

Appendix H: Survey Form for Study 1

Please take a moment to complete the following survey

1. How much attention did you give to the boxed summaries?

A. A great deal

B. A significant amount

C. Some

D. Not much

E. Very little

2. How much did QuikScan help you understand and/or remember the content?

A. A great deal

B. A significant amount

C. Some

D. Not much

E. Very little

3. Do you find QuikScan distracting?

A.   Strongly disagree

B.   Disagree

C. Neutral

D. Agree

E. Strongly agree

4. Do you wish to use QuikScan in your reading in the future?

A. Strongly disagree

B. Disagree

C. Neutral

D. Agree

E. Strongly agree

Other comments and suggestions?

Appendix I: Recruitment Text for Study 2

Participating in reading research, earn class participation points

We are conducting a research study and need students who are willing to participate. This will be considered as an alternative to fulfill some requirements of your class (as explained by your instructor).

In this study, you will be asked to read a document and answer questions. We will time your reading and question answering. At the end, some of you will also be asked to fill out a brief survey about your reading experience. The total time required will be approximately 1.5 hours.

No personal data will be collected. Your performance in reading will not affect your grades. All identifiable information obtained in coordinating the study will be destroyed once the data collection is finished.

HOW DO YOU SIGN UP?
You will be scheduled individually. Email me (Quan Zhou) at qzhou@u.washington.edu to schedule a session or learn more about the study. I am a Ph.D. student in the UW Department of Technical Communication. I would greatly appreciate your participation!

Appendix J: Instructions for Study 2 (QuikScan Group)

Reading Research Study

Department of Technical Communication
University of Washington

Welcome to the reading research study at the University of Washington. We appreciate your help. Today you are going to read a document, answer some questions about the content of this document, and complete a brief survey on your experience.

Please review the consent form on the next page, and if you decide to continue this study, please sign and date the consent form. Your participation is completely voluntary and you may leave at any time you like. Your privacy will be ensured during the study. We are examining documents, not your reading ability. We will not collect personal data about you.

To help us know a little more about your background, please answer the following question:

Do you consider yourself to be knowledgeable about economics and global trade?

Yes   No

UNIVERSITY OF WASHINGTON CONSENT FORM

A Study on the Effects of
Document Formats on Reading

Investigator: Quan Zhou, Ph.D. student (206-931-0689)
Department of Technical Communication

RESEARCHER'S STATEMENT

We are asking you to be in a research study. The purpose of this consent form is to give you the information you will need to help you decide whether or not to be in the study. Please read the form carefully. You may ask questions about the purpose of the research, what we would ask you to do, the possible risks and benefits, your rights as a volunteer, and anything else about the research or this form that is not clear. When all your questions have been answered, you can decide if you want to be in the study or not. This process is called 'informed consent.'

PURPOSE OF THE STUDY

The purpose of this study is to evaluate the effects of different document formats so that better document design could be implemented to serve the readers.

STUDY PROCEDURES

You will be asked to read an article and then answer questions about the content of the article. You will also be asked to fill out a brief survey about your reading experience.   The total time for this study is around 1.5 hours.

RISK, STRESS, OR DISCOMFORT

This study will not expose its participants to risk, stress, or discomfort beyond that normally associated with any non-graded testing environment.

BENEFITS OF THE STUDY

The results of this study can lead to technique design that can result in more readable documents.

OTHER INFORMATION

The names of individual participants will not be used in the tabulation of the results in order to ensure confidentiality. Performance in the study will in no way affect course grades, nor will anyone have access to data on individuals' performances. Data will be retained by the investigator for no more than five years following the date on which the study is administered. You are free to refuse to participate in the study and may withdraw at any time without penalty.

_____
Signature of Investigator   Date

SUBJECT'S STATEMENT

This study has been explained to me. I volunteer to take part in this research. I have had a chance to ask questions. If I have questions later on about the research I can ask one of the investigators listed above. If I have questions about my rights as a research subject, I can call the Human Subjects Division at (206) 543-0098. I will receive a copy of this consent form.

_____
Signature of Subject   Date

Instructions for this study

You are going to read a report in which you will see a series of numbered "within-document" summaries, placed in various sections of the report. We call this "QuikScan." These numbered summaries are put along the report and they summarize the incoming section until the next summary appears. Please read the following guide to QuikScan.

Guide to QuikScan

QuikScan is a set of techniques that we apply to a document in order to make it faster for you to read. We don't re-write the document. We write a summary in which each part of the summary starts with a number that corresponds to the same number in the main body of text where the summarized item is explained in full. See the following example:

Economic Feasibility of Supplying Redcedar to Manufacturers

1} The government funds extraction.
2} The costs to landowners are almost entirely transportation.
3} These transportation costs should typically be $9.25/ton.

1} Currently landowners can make use of state and federal programs that fully subsidize the cost of extracting or otherwise removing redcedar from their property. **2}** Therefore, the cost to landowners of supplying redcedar to manufacturers consists almost entirely of transportations costs. Transportation costs will vary for each landowner depending upon the vehicle load, distance to the manufacturer, and the costs of gasoline. **3}** Our estimate, however, is that most landowners can deliver round wood or whole-tree redcedar to a manufacturer for approximately $9.25/ton, assuming a 100 mile delivery trip and a no-cargo return trip.

<u>Instructions</u>

Please skim the following document as thoroughly as you can in the 10 minutes we have allocated. Make good use of the QuikScan summaries. Once you finish reading, you'll be asked to answer questions concerning the content of the document.   Make the most use of your 10-minute reading to help your answering as much as possible.

Appendix K: Instructions for Study 2 (Non-QuikScan Group)

Reading Research Study

Department of Technical Communication
University of Washington

Welcome to the reading research study at the University of Washington. We appreciate your help. Today you are going to read a document, answer some questions about the content of this document, and complete a brief survey on your experience.

Please review the consent form on the next page, and if you decide to continue this study, please sign and date the consent form. Your participation is completely voluntary and you may leave at any time you like. Your privacy will be ensured during the study. We are examining documents, not your reading ability. We will not collect personal data about you.

To help us know a little more about your background, please answer the following question:

Do you consider yourself to be knowledgeable about economics and global trade?

Yes   No

UNIVERSITY OF WASHINGTON CONSENT FORM

A Study on the Effects of
Document Formats on Reading

Investigator: Quan Zhou, Ph.D. student (206-931-0689)
Department of Technical Communication

RESEARCHER'S STATEMENT

We are asking you to be in a research study. The purpose of this consent form is to give you the information you will need to help you decide whether or not to be in the study. Please read the form carefully. You may ask questions about the purpose of the research, what we would ask you to do, the possible risks and benefits, your rights as a volunteer, and anything else about the research or this form that is not clear. When all your questions have been answered, you can decide if you want to be in the study or not. This process is called 'informed consent.'

PURPOSE OF THE STUDY

The purpose of this study is to evaluate the effects of different document formats so that better document design could be implemented to serve the readers.

STUDY PROCEDURES

You will be asked to read an article and then answer questions about the content of the article. You will also be asked to fill out a brief survey about your reading experience.   The total time for this study is around 1.5 hours.

RISK, STRESS, OR DISCOMFORT

This study will not expose its participants to risk, stress, or discomfort beyond that normally associated with any non-graded testing environment.

BENEFITS OF THE STUDY

The results of this study can lead to technique design that can result in more readable documents.

OTHER INFORMATION

The names of individual participants will not be used in the tabulation of the results in order to ensure confidentiality. Performance in the study will in no way affect course grades, nor will anyone have access to data on individuals' performances. Data will be retained by the investigator for no more than five years following the date on which the study is administered. You are free to refuse to participate in the study and may withdraw at any time without penalty.

_____
Signature of Investigator   Date

SUBJECT'S STATEMENT

This study has been explained to me. I volunteer to take part in this research. I have had a chance to ask questions. If I have questions later on about the research I can ask one of the investigators listed above. If I have questions about my rights as a research subject, I can call the Human Subjects Division at (206) 543-0098. I will receive a copy of this consent form.

_____
Signature of Subject   Date

Instructions

Please skim the following document as thoroughly as you can in the 10 minutes we have allocated. Once you finish reading, you'll be asked to answer questions concerning the content of the document.   Make the most use of your 10-minute reading to help your answering as much as possible.

Appendix L: Information Seeking Questionnaire for Study 2

Questionnaire

Please answer the following multiple-choice questions, one at a time, by hunting through the document. Do this as quickly as you can. Do not read through the entire document. The questions are difficult. Make the most use of the document you have. Once you move to the next question, you are not allowed to go back to change answers.

If you spend a large amount of time answering a particular question, the moderator will intervene and ask you to move on to the next question.

If you absolutely don't know, please mark "I don't know." Please choose only one correct answer for each of the following questions.

1. According to the report, what does "new geography" refer to?
    A. I don't know
    B. Developed countries gaining markets in developing countries
    C. Developing countries gaining markets in developed countries
    D. Developed countries gaining markets in developed countries
    E. Developing countries gaining markets in developing countries

2. According to the report, which of the following is NOT one of the reasons why not all developing countries have benefited from the trade boom?
    A. I don't know
    B. civil conflicts
    C. politically motivated trade embargoes
    D. Illegal immigration
    E. dependence on one or two primary products

3. According to the report, which of the following is a major factor contributing to trade vulnerability?
    A. I don't know
    B. Geographic location
    C. Technology penetration
    D. Strength of democratic institutions
    E. Diversity of manufacturing

4. Which of the following are NOT the strategies used by developing countries to manage commodity price risks?
    A. I don't know
    B. Futures and options contracts
    C. ICA options contracts
    D. Commodity-backed derivative financial instruments
    E. Forward contracts

5. Which of the following best represents the viewpoint of the report?
    A. I don't know
    B. There is a dynamic absolute increase in market share for a number of agricultural and processed foods and beverages items
    C. Automobile engines are not part of the most "dynamic" exports in world trade over the past two decades
    D. Products like computers and televisions witnessed a dynamic absolute increase in market share
    E. There is a dynamic absolute increase in market share for steel and iron

6. Which of the following best represents the viewpoint of the report?
   A. I don't know
   B. The International Task Force on Commodity Risk Management in Developing Countries believes that civil strife and armed conflict influence commodity risk
   C. The concept of commodity risk includes risks of volatile price swings in import prices for food and crude oil
   D. The highest priority of the group of eminent persons under UNCTAD is to give developing countries improved access to primary commodity markets in other developing countries
   E. Africa has never used forward contracts

7. For countries that will continue to derive a large proportion of export earnings from extractive industries in the hydrocarbons and mining sectors, an important element of international commodity policy will be:
   A. I don't know
   B. The adoption of appropriate policies to promote complete market economy
   C. The adoption of appropriate policies to promote effective and transparent management of fiscal revenues
   D. The expansion of foreign investment
   E. The adoption of strategies such as forward contracts, futures, and option contracts

8. The authors of the report agree which one of the following statements about international commodity agreements?
   A. I don't know
   B. Most international commodity agreements have been benefiting developing countries.
   C. International commodity agreements have achieved much success in securing stable, remunerative prices in international markets
   D. International commodity agreements with economic clauses have come under criticism
   E. International commodity agreements lead to more efficient allocation of global commodity resources

9. Which of the following best represents the viewpoint of the report?
   A. I don't know
   B. The export concentration index for developing countries as a whole declined strongly
   C. Although the overall share of manufactures in developing-country exports increased, the share of high-value-added exports did not increase in the past two decades
   D. Only China and India increased the exports in medium-to-high level skill and technology inputs
   E. Middle East countries were at an intermediate status in the export of manufactured goods

10. According to the report, which one of the following is true of commodity derivatives?
   A. I don't know
   B. Lack of institutional capacity hinders the use of commodity derivatives
   C. The majority of developing countries have used commodity derivatives with some degree of success
   D. The use of commodity derivatives is least widespread in Middle East countries
   E. The use of commodity derivatives is unlikely in countries without democratic traditions

11. What does the Prebisch-Singer thesis pertain to?
   A. I don't know
   B. The inevitable failure of international trade agreements
   C. The inevitable transition to a free-market economy
   D. The inevitable failure of all commodity stability mechanisms
   E. The inevitable decline of non-oil commodity prices

12. **Developed countries enjoy much more of the total export value of products involving high research and development expenditures, except for which product category?**
    A. I don't know
    B. Optical instruments
    C. Laptop computers
    D. Titanium-alloy steel
    E. Computer memory chips

13. Which one of the following is true?
    A. I don't know
    B. UNCTAD has not reported successful use of commodity derivatives by Central American countries
    C. São Paulo Consensus was adopted by UNCTAD at its eleventh session in 1999
    D. The Extractive Industries Transparency Initiative (EITI) was first introduced in 2002
    E. Shanghai has become the world's largest commodity exchange

14. The Compensatory Financing Facility (CFF) was a compensatory financing scheme developed by which of the following:
    A. I don't know
    B. The Arab League
    C. The International Monetary Fund (IMF)
    D. The European Union (EU)
    E. The World Trade Organization

15. According to the report, what does the Monterrey Consensus of the International Conference on Financing for Development acknowledge?
   A. I don't know
   B. A non-discriminatory multilateral trading system can help stimulate development worldwide
   C. A non-discriminatory multilateral trading system will not benefit developing countries
   D. A non-discriminatory multilateral trading system will enhance democracy
   E. A non-discriminatory multilateral trading system is harmful to developed countries

16. According to the report, what did economist Paul Samuelson point out:
   A. I don't know
   B. Liberalization does not always have a benign outcome
   C. Free trade primarily benefits resource-rich countries
   D. Liberalization promotes growth in developing countries
   E. Unfettered trade liberalization is not related to deeper trade deficits

17. Which of the following about compensating financing schemes is true?
   A. I don't know
   B. Compensatory Financing Facility (CFF) was replaced by CCFF
   C. The FLEX scheme is expected to provide financing for price risk-management arrangements
   D. The FLEX were abandoned at the conclusion of the Lomé IV Convention in 2000
   E. The STABEX and SYSMIN facilities are less connected to earnings shortfalls from commodity exports

18. According to the report, which of the following will help make commodity-backed derivatives a more successful strategy for developing countries:
   A. I don't know
   B. Providing insurance for exporters
   C. Prevention of price manipulation
   D. Ensuring equitable return on capital
   E. Reducing a nation's dependence on the extractive industries for world trade

Appendix M: Survey Form for Study 2

Please take a moment to complete the following survey

1. How much attention did you give to the boxed summaries?

A. A great deal

B. A significant amount

C. Some

D. Not much

E. Very little

2. How much did QuikScan help you find items of information you were looking for?

A. A great deal

B. A significant amount

C. Some

D. Not much

E. Very little

3. How much did QuikScan help you understand and/or remember the content?

A. A great deal

B. A significant amount

C. Some

D. Not much

E. Very little

4. Do you find QuikScan distracting?

A. Strongly disagree

B. Disagree

C. Neutral

D. Agree

E. Strongly agree

5. Do you wish to use QuikScan in your reading in the future?

A. Strongly disagree

B. Disagree

C. Neutral

D. Agree

E. Strongly agree

Other comments and suggestions?

Appendix N: Audience-Aligned QuikScan Scenario

GREEN COAST COMMUNITY COLLEGES
770 GREEN BOULEVARD, LOS ANGELES, CALIFORNIA 90017 • 213/891-**
CITY • EAST • HARBOR • MISSION • PIERCE • SOUTHWEST • TRADE-TECHNICAL •
VALLEY • WEST
ADMINISTRATIVE OFFICES • ****, Chancellor**

Request for Qualifications
Architectural / Engineering Design Services
Green Coast Trade-Technical College
Learning Resource Center and Library Renovations and Additions

The Green Coast Community College District (District), Office of Facilities Planning and
Development (Office), on behalf of the Board of Trustees is seeking to identify consultants
that will provide Architectural/Engineering Services for Green Coast Trade-Technical College
(GCTTC) for the Learning Resource Center and Library project as a part of the State Capital
Outlay Program with matching funds from the Proposition A/AA Bond Program.

The existing Learning Resource Center contains 81,807 gross square feet consisting of two
floors and a basement.

The overall construction budget for the renovation and additions project is approximately
$39,000,000.

The approved campus Master Plan and the Project Program is available for review at GCTTC
in the offices of the College Project Manager (CPM), *** Associates.

A Pre-submittal conference is not planned for this project.   Interested parties may schedule a
site visit if they choose by contacting the CPM.   Call Ms. *** at (213) 763-7394.

Should you have any questions concerning the information contained in the Request for
Qualifications (RFQ) document, please submit them via e-mail (preferred) or fax not later than
Thursday, October 5, 2006 at 3:00 p.m. as follows:

@.com   - or - FAX: 213-593-****

Statements of Qualification (SOQ) must be received not later than 3:00 p.m., Friday, October
13, 2006 at the offices of the Bond Program Manager, DMJM/JGM, 515 South Flower Street,
Ninth Floor, Los Angeles, CA, 90071.   For directions or parking information please call Ms.
*** at (213) 593-8697.

A.   BACKGROUND

> **1}** The GCCCD serves over one hundred cities in an area of Southern California covering 882 square miles. The district's colleges educate more than 120,000 students a year.
>
> **2}** The colleges range in size from twenty-two to over four hundred fifty acres. Facilities include newly constructed classroom buildings as well as outdated structures older than fifty years.
>
> **3}** The GCTTC, one of the district's nine colleges, is located in downtown Los Angeles, bounded by streets that are poised for major urban beautification in the near future.

{1 The Green Coast Community College District serves over one hundred cities and communities in an area encompassing 882 square miles. The District extends from Agoura Hills in the west San Fernando Valley to the City of San Fernando in the north and Monterey Park to the east. The service area includes Culver City on the west side of the greater Los Angeles basin; Monterey Park and San Gabriel on the east side as well as Palos Verdes Estates and San Pedro to the south. The GCCCD colleges educate more than 120,000 students a year.

The mission of the District is "to provide comprehensive lower-division general education, occupational education, transfer education, counseling and guidance, community services, and continuing education programs which are appropriate to the communities served and which meet the changing needs of students for academic and occupational preparation, citizenship, and cultural understanding."   The Western Association of Schools and Colleges accredits each of the nine colleges.   A seven-member Board of Trustees, elected at large for four-year terms, governs the District.

{2 Geographically, the colleges range in size from twenty-two to over four hundred fifty acres. Facilities include newly constructed classroom buildings as well as outdated structures older than fifty years. Further information about the District can be found on these web sites: http://www.***.edu and http://www.***.org.

{3 GCTTC is a public two-year community college situated in downtown Los Angeles on a 23 acre site.   The campus is bounded by Grand Ave, Flower Street, Washington Blvd. and 23rd Street, each poised for major urban beautification in the near future.   The college is one of the nine colleges that form the Green Coast Community College District.

B.   PROJECT DESCRIPTION

1} The school's master plan calls for renovation and new additions to the existing LRC. A Final Project Proposal (FPP) was submitted to the State in April 2005. The total project construction cost (including temporary portable facilities) is estimated at $ 39 Million.

2} The existing building, built in 1978, is 81,807 GSF and houses the Library, Media Services and portions of the Network Operations Center.

3} The existing building has several deficiencies, including poor utilization of site and space.

{1 The 5-Year Master Plan completed for GCTTC in 2002, for execution of the Bond Program, calls for renovation and new additions to the Learning Resource Center (LRC). In April 2005, the District submitted a Final Project Proposal (FPP) to the State requesting funds for the project.   The total project construction cost (including temporary portable facilities) is estimated at $ 39 Million. Funding is through the State Capital Outlay Program with matching funds from the Bond Program.

{2 The existing LRC Building built in 1978, contains 81,807 GSF in two floors and a basement. It currently houses the Library, Media Services and portions of the Network Operations Center (MIS). The building is a two story steel structure over a one level basement. It is classified as Type 1 construction.   The building contains fire sprinklers. The design, in accordance with the As-Built drawings, appears to be consistent with the 1975 Building Code in place at the time of construction.

{3 A Programming document included in the FPP identified the deficiencies in the existing building which are described below:

- Poor utilization of a building site which reduces potential available instructional area for the college.

- Under-utilized basement on a campus that is in need of large open area rooms for assembly and instruction

- Building efficiency and function are compromised by the inefficient utilization of space and the way the building is currently being used to accommodate evolving educational programs.

- Fragmented voice and data infrastructure of the college

- Building designed to 1975 building code and needs seismic retrofit.

- Non compliance with current ADA standards.

The Programming document shows proposed floor plans with new footprint for the addition to the building, analysis of and recommendations for the structural system, MEP systems and technology. This project requires program validation and design services for the modernization and addition to the LRC.

Fig. 1 below shows Building 'L'- Learning Resource Center location in the Campus plan.

C.   SCOPE OF SERVICES

The services to be provided will include but may not be limited to the following:

- Program Validation contained in the Final Project Proposal dated April 15, 2005. A copy of this document will be given to firms short-listed for the interview. Validation of the Program will include conducting meetings with the user groups, college faculty and shared governance.

- An addition of 17,758 GSF included in the build out of covered open-air exterior areas currently contained within the building structural envelope.

- Accommodating Additional program functions from the existing building C and E and some related functions currently in Building A. In addition the following programs: Management Informational Services Program (MIS), a Labor Center, An Employment Center, Apprenticeship, Mail room, Communication Center, Academic Senate, Writing Center, Learning Skills Center, Network Operations Center (NOC)

- Defining flow of traffic to the existing basement by construction of a new entry court along the south face of the building.

- Seismic hazard mitigation to upgrade building structure to current CBC. Mitigation measures include construction of new concrete shear walls utilized to augment existing steel moment frames.

- Interior modifications to the existing basement to convert inactive space to LRC program area, including incorporation of all above mentioned programs and accommodate new programs if needed.

Interior modifications to include:

- Improvement of circulation and library entrance for improved security and building efficiency

- Removal of underused interior atrium and replacement with useful assignable square footage functions

- Restrooms to be upgraded. Existing restrooms to have all floor wall and ceiling finishes replaced. Provide new fixtures, toilet partitions; grab bars, electric hand dryers and other accessories as required.

- Remodel of casework and library shelving to current accessibility codes.

- Upgrade of audiovisual and Technology infrastructure

- Provide furnishings and equipment for new and modified building area including new end user computer equipment for new skills center.

- Removal of exterior wall surfaces and replacement with new building façade including replacement of existing windows with new insulated curtain wall to improve building energy efficiency, reverse building deterioration and improve appearance.

- Modernize building infrastructure as required to incorporate sustainable building concepts and operation practices through design which reduce life-time operational costs for the college, maximize energy efficiency and use of renewable resources.

Additional Notes:

- The GCTTC Campus is land locked and has minimal space for parking, lay down area, delivery etc. thus requiring close coordination with Campus Facilities Management to ensure that campus operations are not affected during construction. Programming Verification of the facilities will have to take this into consideration.

- The District's CAD drawing standards shall be followed for all drawings produced for this project.

- The College has developed Campus Wide Aesthetic guidelines which will be provided at the beginning of the project.

- The campus has developed a review process (Attachment 4) to ensure new design projects adhere to campus wide aesthetic concepts. Submittals for the aesthetic guidelines review will coincide with the standard design phase reviews requested in the design services contract. These include: Schematic Design, Design Development, 50% construction documents and 100% construction documents. Please factor in all meetings and submittal requirements outlined in Attachment 4.

- Schedule expectations: Validation of the FPP and Design Services for the LRC building

are scheduled to be completed by April 2008 when plans will be submitted to DSA for review. Schematic Phase of Design is required to be completed by April 2007. Assuming a 6 month DSA review period, and Board of Trustees approval, Bid and award for the project is scheduled for April 2009.

D. REQUIRED INFORMATION AND FORMAT

In order to be considered for selection as an "Architectural/Engineering Services consultant" for this project, the respondent individuals, firm or firms shall submit a Statement of Qualifications (SOQ) using as a minimum the following criteria.   The individual or firm should state why it believes it is qualified to provide the services requested in the RFQ.   The SOQ must be prepared addressing the following items in the specified order:

1. Letter of Introduction

   a. Provide a letter of introduction signed by an authorized officer of the organization.

   b. If submitting as a team, note which team is the prime consultant or lead joint venture partner (if applicable).

   c. Note the name of the individual who will lead the architectural services team.

2. Firm Information

   a. Type of organization or company structure.

   b. Certification that the "Architectural/Engineering Services" firm is legally permitted or licensed to conduct business in the State of California for the services offered.

   c. Number of years the firm has been in business.

   d. Location of principal office that will be responsible for the implementation of this contract.

   e. Litigation: The firm or firms must have an acceptable history of working proactively to avoid litigation.   Provide specific information on termination for default, litigation settled or judgments entered within the last five (5) years, and civil judgments or criminal convictions for false claims within the last five (5) years.

   f. List the company's and the individual team member's experience in providing same services.   Include a list of at least three Library projects including the following:

      Project Name and Description

      Construction Cost

      Duration and year of completion

Client Contact, name, title, email address, telephone and postal address.

g. Provide a list of at least five job performance references including the name of the organization, the individuals name and job title, along with the contact address and phone number.

3. Project Team Qualifications

a. Identify the following key members within the firm and provide their resumes with qualifications especially as it relates to upper division school projects, and specifically Child Development Centers in a Community College setting:

1. Project Manager

2. Lead Architect

3. Lead Engineer

4. Lead Estimator

5. Lead CAD Designer

b. Identify any proposed consultants, such as civil, structural, mechanical, electrical engineers and any other relevant disciplines for this project. List license numbers and dates as well as business address, phone number and fax number. Include resumes and related experiences for appropriate members of these firms.

4. Firm Resources

a. Provide a statement demonstrating your firm's or team's ability to accomplish the scope of services in comprehensive and thorough manner with an aggressive schedule in order to meet a client's goal of moving projects into construction within the earliest possible timeframe, in compliance with CEQA.

b. Explain the firm's design capabilities as they relate to:

1. Design philosophy and process

2. Integration of flexibility and future technology into the design.

3. Work plan with the current workload and next six-month backlog and available staffing plan.

c. Explain the firm's technical capabilities in the following areas:

6. CAD capability and software proposed to be used to produce the deliverables for the project; and the ability to provide the District with electronic CAD files.

7. Cost estimate history, comparing cost estimates versus actual bid amount on three school projects awarded in last five years.

8. Quality control / assurance procedures, including coordination of

design disciplines, complying with program requirements and conformance with Federal/State/Local applicable code requirements.

9. Experience and qualifications on Library Projects, preferably on a Community College campus and/or Green Coast Community College District campus, detailing scope, budget and scale of previous projects.

10. Experience in sustainable design.

11. Experience working with State/Local agencies, including Department of State Architect, City Public Works and Fire Departments.

12. Experience with photovoltaic systems.

13. Financial Information

d. Provide credit references and information regarding the firm(s) financial stability.

E.   SUBMITTAL REQUIREMENTS

The individual or official of the firm who has the power to bind the firm contractually must sign the SOQ cover letter. The SOQ preparation and associated costs are the sole responsibility of the submitter and will not be reimbursed by the District.   Three (3) hard copies of the SOQ and One (1) CD containing an electronic version of the SOQ (in "MSWord" or "pdf" format) shall be submitted.   Submittals shall not contain more than thirty (30) pages single-sided or fifteen (15) pages double sided, excluding front, back covers and tabs. Submittals containing more than the stated page limitation will not be considered.

F.   BASIS OF AWARD

The SOQs will be evaluated based on each firm's qualifications and relevant experience with similar work.   The District and the College will evaluate all SOQs.

G.   FEE

Following the qualifications-based selection process, fees will be negotiated based on the District's Fixed Fee Guidelines for Design Consultants.   If fee negotiations with the firm deemed most qualified for the project, based on the firm(s) SOQ and interview, are not successful, the District will seek to negotiate and execute a contract with the next most qualified firm.

H.   CONFLICTS OF INTEREST

Any qualified firm previously selected as College Project Manager at a particular college(s), will be prohibited from responding to RFQs for any architect/engineering services at that college.

I.   COMMUNITY ECONOMIC DEVELOPMENT PROGRAM

The District's Board of Trustees… recognizes the importance of promoting economic growth in the communities it services and therefore …encourages the involvement of local, small and emerging businesses in every aspect of their Programs.

On January 14, 2004, the Board of Trustees adopted Board Rule 7103.17. All parties considering submitting a Statement of Qualifications in response to this RFQ are encouraged to review the full text of Board Rule 7103.17 which may be accessed at www.laccd.edu under the "About Us" heading.   Click as follows: "Board Rules/Chapter VII/Business and Fiscal Services/Article I – Contracting/7103.17"

Board Rule 7103.17 requires that each proposer either demonstrate that 28% of the work to be awarded under the contract will be performed by small or emerging companies or that the prime proposer demonstrates that it has made a good faith effort to achieve this participation. This requirement will not apply if the prime proposer will be performing ninety-five percent (95%) or more of the contract through its own employees. For purposes of meeting this requirement the following definitions shall apply:

- A company shall be considered an "emerging" company if it has been in business less than five (5) years as of the date of the due date established for submitting the SOQ, and
- A company shall be considered a "small" company if its gross revenue does not exceed the small business limits established by the federal Small Business Administration. To meet this requirement it is not necessary that the consultant or sub consultant actually hold a S.B.A. certification, but only that it has gross revenue below S.B.A. limits. S.B.A. small business gross revenue limits may be found at the SBA's table of size standards for Professional Services, which can be found on the SBA web site at http://www.sba.gov/size/sizetable2002.html, under Subsector 541.

J.   COLLEGE INTERNSHIP PROGRAM

On October 17, 2001 and June 25, 2003, the District's Board of Trustees adopted resolutions to establish a Community Economic Development Program (CEDP).   The CEDP Program includes a College Internship Program geared to involve District students at each of the colleges in the work.

The District is committed to supporting educational and vocational opportunities at the nine colleges and satellite facilities of the District.   The District's Board of Trustees believes the Student Intern Program is a key component of the Bond Program that can be realized through a collaborative effort engaging businesses, college faculty, and students seeking to enrich their academic education with a work experience that will assist them in their career preparation.

The District's colleges offer very diverse academic and vocational programs ranging from

business, construction, architecture and engineering to language, science, computer technology, and a range of other subjects.   Students from any and all discipline areas are interested in obtaining internships that will expand their work experience and guide them on their career path.   We are confident that the Student Intern Program can match very talented students with the work needs of firms responding to this RFQ.

Responders are directed to note the requirement to describe their outreach efforts in this regard as listed above.   In addition proposers are advised that their outreach efforts may be a topic of question during pre-selection interviews.

K.   EVALUATION & ACCEPTANCE OF SOQ

The District reserves the right to reject any and all SOQs, to amend the RFQ and the RFQ process, and to discontinue or re-open the process at any time.

L.   NON-LIABILITY OF DISTRICT

The District shall not be liable to the Consultant for personal injury or property damage sustained in the performance of these services, however caused.

M.   INDEMNIFICATION (See Design Consultant Services Agreement, Article 9)

N.   INSURANCE (See Design Consultant Services Agreement, Article 9)

Appendix O: Sample Syllabus for Using QuikScan

Date	Topics/Activities	Assignments
Day 1	Introduction to QuikScan • Understanding the design of QuikScan • Understanding the purpose of QuikScan • Understanding the measures of excellence in QuikScan • Understanding the QuikScanning process • Understanding the rhetorical dynamics of QuikScan	
Day 2	Project Briefing • Introducing project goals • Introducing the existing document • Introducing target audiences • Meeting stakeholders • Audience Involvement I (Meeting target audiences)	Project proposal; developing personas
Day 3	Processing the Existing Document • Reading the existing document • Profiling the invoked audience(s) of the existing document • Strategizing QuikScanning	QuikScan strategy proposal
Day 4	Drafting QuikScan • Summarizing and highlighting • Groups of students taking responsibility for their portions of the document	Drafted portions
Day 5	Peer-reviewing and revising • Peer-reviewing among QuikScanners • Assembling portions • Revising the draft	Integrated draft
Day 6	Audience Involvement II • Audiences interacting with draft • QuikScanners interacting with audiences	Refining personas; adjusting strategies
Day 7	Further revising	Near-final version
Day 8	Audience Involvement III • Testing draft • Collecting comments and suggestions	
Day 9	Finalizing QuikScanned documents	Final version
Day 10	Presentation	

The purpose of this syllabus is to demonstrate the potential value of QuikScan in helping students communicate effectively. In ten days, students produce a QuikScanned document collaboratively. In this process, multiple students become QuikScanners. Stakeholders and real audiences are involved iteratively.

Upon completion, students are expected to achieve the following learning objectives:

- Understand the mechanics of QuikScan

- Be able to analyze an existing document and identify its gist

- Effectively strategize the QuikScanning in light of project goals and audience needs

- Effectively interact with the involved audience and develop personas and scenarios on an iterative basis

- Successfully collaborate with other QuikScanners on drafting, revising, and refining

On the first day, students learn about QuikScan. In order to foster a thorough understanding of QuikScan, students not only learn the mechanics of QuikScanning a document, but the measures of excellence and the rhetorical dynamics. On Day 2, students are briefed about the project. They learn about project goals, the original document they work from, and their target audiences. For the first time, students meet with the real audiences and stakeholders. At the end of the day, students write a brief project proposal and develop one or more personas with basic profile. After learning about QuikScan and the project, students read the given document in detail on Day 3.

Their task is to profile the invoked audience of the given document and to strategize their QuikScanning based on what they learned on Day 1 and 2. Students may make preliminary decisions on what summary types to use and what to highlight. On the fourth day, students split into groups, each group in charge of QuikScanning a particular portion of the documents. On Day 5, students review one another's portions, check for inconsistencies, assemble the portions, and produce an integrated draft. On Day 6, audiences are involved for the second time to read the integrated draft and interact with students. Then students refine their personas and adjust QuikScanning strategies. On Day 7, students further revise the draft and prepare for another round of audience involvement. Audiences test the near-final draft on Day 8 and offer comments and suggestions. Students finalize the QuikScanned document on Day 9 and present their work on Day 10.

This sample syllabus does not mandate the number of days taken or the sequence of activities. It primarily intends to show a possible roadmap to implement QuikScan in technical writing classes.

VITA

Quan Zhou was born in Wuhan, the People's Republic of China. He graduated from Wuhan University with a Bachelor of Arts degree in Editing and Publishing and a minor in Journalism. In 2005 he earned a Master of Science in Technical Communication from the University of Washington. Quan has published and presented in various areas of technical communication. He has professional experience in China and the United States as a technical journalist, technical writer, and usability researcher.