Technical Communication or Information Design?

A New Zealand Perspective

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Abstract

Abstract

This research aims to investigate and analyse current trends in New Zealand technical communication. Specifically, it considers how these trends compare to those evident in the United States of America, where the research shows a contemporary paradigm shift occurring from technical communication to information design.

The findings of this research show that New Zealand technical communicators do have the core competencies of information designers and that technical communication in New Zealand is, indeed, undergoing a similar change to that happening internationally, especially in the United States of America.

The research methodology of this study uses data from two sources:

- Current literature on trends in technical communication and information design
- A qualitative survey of New Zealand technical communication practitioners.

Current literature in the field describes trends that suggest a shift in the core competencies of contemporary technical communicators. This literature largely emerges from an American context. These trends include:

- A need for technical communicators to be part of the iterative design process of products and to be user advocates
- A change from paper-based documents to online information
- The advent of the Internet
- The advent of single sourcing and knowledge management computer tools.

This study concludes that technical communicators need a broad range of competencies to adapt to the trends described, and that it is no longer adequate for a professional technical communicator to simply be a good

writer and document designer. However, this study also shows that New Zealand practitioners currently do demonstrate the key competencies of information designers, including highly developed skills in problem solving, planning and managing the process of product development, information management, usability testing, while continuing to carry out the more obvious tasks of technical communication, such as writing, audience analysis and document design.

The main difference between the American and New Zealand technical communication trends analysed here is that technical communication in New Zealand is just becoming recognised as a profession, whereas in the States it has existed since World War Two (WW2). Because of this historical difference, it seems that New Zealand practitioners are not bound by traditional job titles as their American counterparts are, and also tend to have position designations that are more readily recognised by clients and users, such as "documentation specialist", or "document developer".

To date, no formal research on technical communication or information design has been completed in New Zealand. Further research is recommended then, in order to gain a more detailed profile of practitioners and practices. This research could be used to address areas such as training needs and, more widely, could continue to raise awareness of the profession in New Zealand. Further research should focus on gathering information on the geographical distribution of practitioners, profiling tasks, tools and jobs, analysing salaries, and examining potential academic programme profiles that could meet the needs of potential information designers.

Introduction

Overview of technical communication trends

Introduction

Technical communication is just gaining recognition in New Zealand as a profession. This is reflected in the recent establishment of professional associations such as the New Zealand Chapter of the international Society of Technical Communication (STC) in 1995 and the New Zealand Technical Writers' Association in 1997. However, no research has been completed in New Zealand to see if there are any commonalities between the trends occurring here and those happening internationally.

Technical communication in America

Technical communication as a profession originated in America, and its professional body, the Society of Technical Communication is an American-based group with over 250,000 members, mostly residing there. The profession has been recognised in America since WW2 and, unlike New Zealand, has a history of technical communication programmes at university level dating back as far as the 1950s. When those graduates describe themselves as technical communicators or technical writers, most people would understand what this means. However, these titles do not have the same recognition in New Zealand.

In America, trends and developments in technical communication are well researched and documented. Historically, the profession developed in response to the rise in technology and the increase in scientific endeavours during and after WW2. Technical writers wrote complex documentation, such as instructional manuals and procedures, and were generally male engineers or other professionals attached to the military in some way. This documentation was done at the end of the product development cycle and was designed to be used mainly by highly technical staff, rather than by members of a wider public.

Generally these early technical writers wrote paper-based documentation by hand and then had it typed up by assistants. However, during the later

years of the twentieth century, as technology became more accessible to the public, consumers increasingly began to demand products with adequate supporting documentation. And in response, organisations saw the marketing benefits of providing supporting documents designed with the user in mind.

This rise in consumer demand for usable product information, as well as the invention of the personal computer, led to the first major paradigm shift in technical communication in America. In this way, technical writers became technical communicators, finding themselves increasingly responsible for ensuring that documentation was aimed at users' needs rather than being just a "tack-on" at the end of a product's development. So, technical communicators' roles changed and began to include competencies like being able to carry out an audience analysis, designing documents, and being able to use computing tools to produce a variety of information packages to meet users' needs.

In a similar way, the current technological revolution sparked by the rise of the Internet is responsible for another shift in the way technical communicators operate. Web-based technologies, for example, are changing the skills technical communicators need to be able to work successfully. Today, organisations like banks and insurance companies can be more widely known for their information products, such as EFT-POS, online banking or interactive Web sites, than for their buildings. As a result, technical communicators now design information that is presented in a range of forms, including online formats, paper-based formats, CD-ROMs, videotapes and other multimedia products.

Consequently, contemporary technical communication practitioners need a broad range of skills that are largely focused on bringing a problem solving approach to communication, rather than being focused on producing discrete product outputs. Overall, the urgent need for understandable

information continues to increase in demand, and consumers expect more performability and usability from product information and the Internet. This is the paradigm shift that has led to a move in America to redefine the profession of technical communication to that of information design.

Technical communication in New Zealand

Before 1996, research into the field of technical communication in New Zealand was limited. There is scant information available on whether or not the paradigm shifts that have occurred in America are mirrored here, or whether practitioners are moving towards an information design skills' profile in response to the advent of Web-based of information.

We do know, however, that the profession of technical communication in New Zealand has become more visible and recognised since about 1999, and that two professional associations for technical communicators have been established. We also know that the demand for training has increased in response to the increasing need for documentation specialists to replace incumbent untrained staff.

One indicator of this recent change can be measured by the development and growth in the Graduate Diploma of Technical Communication (GDTC) online programme, offered by the Christchurch Polytechnic Institute of Technology (CPIT). Set up in 1996, this programme was initially presented in response to the demand for qualified writing practitioners to work at two of Christchurch's larger technology companies, Tait Electronics and Aoraki Corporation. Up until this time, these companies were actually importing qualified practitioners from America and England to write their product documentation, create their design specifications, and produce their training materials. This proved to be a costly exercise.

Today GDTC graduates are in high demand, and at present this demand in Christchurch alone outstrips supply. Similarly, the demand for places in the

programme has more than doubled in the past two years and entry has become competitive. Enrolments now come from Australia, Canada, America, Japan, Singapore, India and Europe, as well as from New Zealand.

Furthermore, the demand for freelance or contract technical communicators continues to increase around New Zealand, to the extent that often these practitioners have to turn away work or expand their businesses to cope with volume demands.

The purpose of this study

Introduction

This research aims to determine current trends in technical communication in New Zealand, and to compare these to trends occurring in America, as identified through the literature. The following research problems and related questions and answers form the basis of this study, along with information gathered from published literature sources.

Research problem one: What do New Zealand technical communicators do?

The results for this research problem were derived from data collected from the following questions:

- How do technical communicators in New Zealand define their job titles?
- What tasks do they complete?
- How do they spend their day?

Research problem two: What are core competencies do technical communicators have, and which do they believe are essential for their roles?

The results for this research problem were derived from data collected from the following questions:

- What training have they had?
- What training would they like to have?

- What do they believe are the essential skills needed to be a successful practitioner?

Research problem three: How have technical communicators' jobs change, and what future changes do they predict?

The results for this research problem were derived from data collected from the following questions:

- How have technical communicators' roles and tasks changed since they first started in the profession?
- What predictions do they have about the future of technical communication?

Research problem four: What is the role of computing tools in practitioners' jobs?

The results for this research problem were derived from data collected from the following questions:

- What computing tools do technical communicators currently use to complete their work?
- How did they learn these tools?
- What changes in computing tools do practitioners predict?

Research problem five: Are New Zealand practitioners following the American trend of redefining their roles as information designers?

The results for this research problem were derived from data collected from the following questions:

- Do the competencies, roles, tasks, and future predictions of practitioners mirror a paradigm shift to information design?

Research Outcomes

The results of this research will be used in the following ways:

- To promote awareness of the profession in New Zealand through publications and presentations nationally and internationally

- To give existing practitioners an overview of what their colleagues are doing in New Zealand, as well as fostering more networking and membership of professional associations by giving feedback of the results to members
- To ensure the existing Graduate Diploma of Technical Communication at CPIT is meeting the training needs of future practitioners
- To determine the potential for a degree in Information Design.

Literature Review

Introduction

The impact of rapid technological and scientific change, combined with increased consumer demand for clear and usable product information, has significantly altered the core competencies needed by contemporary technical communicators to carry out their roles successfully. Currently, many technical communicators in America are renaming themselves information designers, reflecting a paradigm shift away from technical communication and towards information design.

Technical communication has been an academic discipline in America since the 1950s, and a wide range of academic programmes now exist to train people in the key skill sets of the field. Professional associations have also grown up to support the professional needs of practitioners. The majority of the members of these professional associations, such as the Society of Technical Communication (STC) and the Institute of Electrical and Electronics Engineers, Inc. (IEEE), are based in the US.

This review analyses recently published research into the changing profile of technical communication and communicators, and considers what changes have occurred, how these changes originated, and what the future for the discipline is likely to be. The review looks at the concept of information design from a range of angles, and analyses whether the work of technical communicators today is, in fact, more accurately described as information design.

The literature in this review is drawn mostly from American research, and is later used to compare similar themes and trends identified as occurring in New Zealand. Much of the literature is sourced from STC publications, which supports and conducts the bulk of current technical communication research.

Definitions

The key terms used in the report are as follows: (please refer to the Glossary section for a more detailed list of definitions).

Information design

The Information Design Special Interest Group of STC defines information design as:

> ...[the application of]... traditional and evolving design principles to the process of translating complex, unorganized, or unstructured data into valuable, meaningful information. [It]... requires an interdisciplinary approach that combines skills in graphic design, writing and editing, instructional design, human performance technology and human factors (2001, p10).

Technical communication

Lay et al. describe technical communication as, "...information from a subject matter expert (SME) that is translated into knowledge for use by a specific audience to complete a specific task or solve a specific problem..." (Lay et al., 2000, pp10-11).

Technical writing

Lay et al. describe technical writing as, "...a subset of technical communication that focuses on the production of written documents..." (Lay et al., 2000, pp10-11).

Documentation

Edelman defines documentation as:

> ...all the shared records of a project or process, such as plans, specifications, analyses, descriptions, instructions or policies...reports, screens and Web pages.... Education devices encompass[ing] manuals, instructions, training materials, exhibits and marketing materials...(2001, p11).

Outline of the Literature Review

The literature review is divided into the following sections:

- Trends affecting the development of technical communication
- Document design or information design?
- The information design profession
- Summary.

Trends affecting the development of technical communication

This study argues that the broad range of core competencies needed by contemporary technical communicators has been determined by the historical development of technology, and the corresponding demand for information. Within this context, four main elements have influenced the development of contemporary technical communication:

- Writing traditions
- Technological innovations
- Consumerism
- Online information.

Writing traditions

One of the key developments in the history of technical communication was the early and continued centrality of writing traditions. The discipline's origins are entirely founded in writing, and the power of these traditions continues to be evident in contemporary technical communication. Schriver (1997) notes that the following three writing traditions have determined the way technical communicators and organisations perceive of, write, and design documents today:

- The craft tradition
- The rhetorical tradition
- The romantic tradition.

The craft tradition

This early approach to writing, dominant up until the 1940s, focused on the rules for getting the details of writing correct. Within the craft approach, writing students were taught detailed technical skills that encompassed the minutiae of prescribed grammar and word usage. Writing teachers worked as grammar specialists or "doctors" (Schriver, 1997, p60), or as remedial composition experts on campuses. The lingering influence of this tradition on contemporary technical communication is evident in the on-going view of practitioners as editors or, in Schriver's terms, "grammar doctors" able to come in at the end of a project and run a check over a document's mechanical well-being.

By the 1950s, however, this craft tradition no longer offered a broad enough range of skills for practitioners to meet consumers' wider demands for usable information. Consequently, the craft tradition evolved into an increasingly rhetoric-driven form, where a concern for the details of grammar and style remained, but where a revival of the classical notion of rhetoric or persuasion was also evident.

The rhetorical tradition

Schriver argues that the rhetorical tradition adds three important concepts to that earlier craft tradition: audience, invention and heuristics (Schriver, 1997, pp58-59). She notes that this was a response to an increasingly demanding audience base. She shows that in the second half of the twentieth century, writing teachers moved away from emphasising the mechanics of grammar and spelling, and focused more on encouraging students to consider how the design of their documents might meet the information needs of a specific audience. Indeed, audience need began to determine the way material was, as Schriver describes it, "invented" according to what readers might expect. Consequently, a set of heuristics developed. These were rules for those generic formats expected by audiences. As an example of this, Souther (1997) describes how the

heuristic approach has led to the way that readers now expect to see reports, "... conclusions, summaries and recommendations [are placed] at the beginning of the report because the administrators are most interested in such material ... and [there is] more widespread use of devices such as statements of purpose and background..." (Souther, cited in Schriver, 1997, p66).

From the 1950s onwards, the rhetorical tradition allowed technical writers to build on their skills as grammar doctors and become more audience focused. This marked the first change in the broadening of those core competencies needed to work as a technical communicator, and more importantly indicates a shift towards communication, and away from writing. The rhetorical tradition continues to exert a strong influence on contemporary technical communication

The romantic tradition

While the craft and rhetorical traditions focus on teaching the right way of thinking about words and readers, the romantic tradition, by contrast, posits that a writer is born and not made. During the 1960s renewed interest in the romantic movement emerged, along with a range of alternative ideas regarding creativity and writing. This tradition holds, as Schriver notes, that "...writing as an art is essentially a mystery – a journey of self expression that cannot be taught" (Schriver, 1997, p66), and therefore, the focus is more on the creative process of writing and less on the reader's needs.

Technical communication's traditional association with inflexible heuristics and regulated genres seems rather oppositional to all of the "chutzpah" of creativity. On the surface then, it appears that this tradition has had little influence on the profession of technical communication today. However, creativity may yet play a part in the paradigm shift now occurring from technical communication to information design. As information products

become centred on objects rather than words and begin to move further away from traditional genres, perhaps we are seeing the beginning of a less formal and more romantic or creative approach.

Technological innovations

The previously discussed writing traditions emerged to support the documentation needs of new information products. And in turn, these changing needs have been determined by the rapid development of new technologies. New technologies and their associated information products have established the task profile of contemporary technical communication and continue to influence the future trends of the profession.

As we have seen, technical communication is not a new field. Users of any new technology have always demanded information in some shape or form. Early communications, such as cave paintings and hieroglyphics, were often actually ancient user guides that explained how to use weapons, build pyramids or temples, or follow social and religious rituals.

However, later twentieth century innovations in technology and science, as well as a massive increase in consumerism, have redefined the nature and shape of technical communication as a profession. Technical communication did not start to become a recognised profession until after WW2 when advanced weaponry and technical and scientific innovations increased the demand for written instructions. New innovations in consumer products after the war also added to the demand for people who could write clear instructions that the average member of the public could understand and use (Schriver, 1997), and this increasing demand resulted in a shortage of technical writers.

In response to this rise in technology and increasing demand for usable information, the first Society of Technical Writers was founded in 1953 in America. As previously noted, up until the 1950s, engineers, especially

those involved in the military, wrote most technical communication. And the role of the writer was based on the craft tradition with writers being seen solely as wordsmiths and editors. Little attention was given to the quality and usability of documents until new innovations and products started becoming more available to the general public. The establishment of the Society of Technical Writers signalled the beginning of a changing professional consciousness regarding the skills, rights and responsibilities of writers; those providing information to users or audiences with information needs.

A further determining factor in the growth of technical communication in the US was the GI Bill that made tertiary education freely available to returned servicemen after WW2. Two million returned servicemen took advantage of these opportunities, and many of these entered engineering programmes. At that time, the only academic programmes that offered technical writing in the curriculum were located in engineering faculties, and these were mostly taught as remedial classes for reluctant engineering students who found themselves somehow having to write. This increase in engineering students who had to complete technical writing courses as part of their studies, as well as the increase in technological and scientific studies, led to a growing post war awareness of the need for technical writers (Staples, 1999). So, as the American domestic technology boomed in the post war years, so too did the demand for trained writers increase and the first "stand alone" technical communication programmes began to be offered. In 1958 the first Masters programme in technical communication was offered at Rensselaer Polytechnic Institute.

Staples' study (1999) of the history of technical communication describes the changing face and roles of the technical communicator over the past 30 years and notes that in the 1970s the typical technical writer was more than likely an ex-military male writing manuals for English speaking audiences to support complex engineering products. This writer's tools of

trade were a pencil, a typewriter and a note pad. He might also have a college degree and would probably have worked for the same organisation for a long period of time.

The core competencies required by this 1970s practitioner were based on Samuel Earle's "four abilities" (cited in Kynell 1999). These abilities emerged from the rhetorical tradition and were believed to make English more useful for engineers, providing the basis for technical writing curriculums in engineering faculties. The four abilities are:

- The ability to write
- The ability to describe, in writing, an object not present
- The ability to write for different audiences
- The ability to give a concept full treatment by demonstrating understanding in writing (cited in Kynell, 1999, p4).

However, Staples' historical overview of the profession (1999) also suggests that a significant shift away from these four abilities began to occur in the late 1990s. It notes that today, the technical communicator is more likely to be a woman working as a contractor for several companies. She is probably well educated and able to use a wide variety of technical and computing tools. The most important difference between her and her 1970s predecessor, however, is her ability to multi-task using her broad range of skills, which might include writing and editing, project management, researching, usability testing, document design, and the ability to drive a successful business forward. She may also specialise in several different areas of technical communication, such as producing online help, managing international communication projects, maintaining information management systems, or producing environmental communication.

Staples' study suggests a change to the profile of the technical communicator away from an emphasis on "technical", and towards an

emphasis on "communicator". And similarly, Davis describes the findings of a "snapshot" survey of technical communication Masters degree students at Mercer University in America (2001, p4) in which the students' undergraduate degrees were predominantly in arts and social sciences, rather than in sciences or technological areas. This again suggests that increasingly, practitioners need to be communicators first and technology experts second. According to Staples, this new technical communicator is trained in a "...wide base of theory, inquiry, and application...", and could "...in the face of change responsibly support and even direct the social uses of information and technology..." (Staples, 1999, p8). It seems that the discipline of technical communication has developed to such an extent that practitioners and academics can now be proactive in setting the trends for the future, rather than having to respond reactively to the needs of product development or engineering faculties.

Further to this argument, Hayhoe crystallises the competencies needed by technical communicators as a "...mastery of communication techniques. Among others, these skills include writing and editing, visual communication, multimedia, document design, audience and task analysis, usability testing of products and documents and interpersonal skills..." (Hayhoe, 2000, p2). Other core competencies that Hayhoe notes include, knowledge of subject domains, for example, science, medicine, engineering, computing, and knowledge of software tools that can be used for a specific task.

In contrast, however, the job descriptions for many technical communicators in contemporary organisations do not yet reflect practitioners' extensive competencies. While documentation is still seen by some organisations as "a tack on", to be rushed through after the product has been completed, technical communicators will continue to regarded as little more than desktop publishers who happen to be able to use

sophisticated tools such as FrameMaker or RoboHELP or similar (Hayhoe, 2000).

The rapid development of technology has meant an increased demand for technical information. Technical communication has grown as a discipline in response to the demand to produce information designed for users of domestic and technical products and services, and the profile of practitioners has also markedly changed.

Consumerism

The third key influence on the development of technical communication is continuing pressure from consumers for better information. Consumers have not only demanded a change in the style of technical writing, but have also demanded a change to the way in which information is designed. The following section discusses:

- Plain language movements
- User-centered design.

The plain language movement

As consumers continued to demand better quality information, their frustration with unreadable documentation increased accordingly. Discussing feature articles published in 1991 from *Newsweek, Time* and *Business Week*, Schriver describes the plight of "...consumers...frustrat[ed] with technology that is getting more and more difficult to use, with interfaces that are cumbersome and cluttered and with documents that make readers weep..." (1997, p147). In response to this growing level of frustration, various plain language movements began to emerge in America, Australia, Britain, Canada and New Zealand (Mazur, 2000), some as early as 1953. Governments in all of these countries supported this movement, and in New Zealand for instance, Parliament created the Law Commission whose duty it was to advise the government on ways in which the law could be made more comprehensible to the people.

The plain language movement, however, is essentially based on the rhetorical and craft writing traditions. Further, many of its tools, such as readability scales, do little else but regulate a document's level of complexity. So for this reason, by the mid-1980s researchers were actually beginning to discredit plain language movements. They were particularly critical of their reliance on reductive readability formulas, "dumbed down" constructions, and excessively truncated sentences. Critics also noted the lack of research available to support plain language's ability to clarify understanding. Schriver (1996), for example, argues that rather than focusing on mechanics, or blindly using unproven tests to determine a document's readability, what is really needed to aid comprehension for users is a more holistic focus on the whole process of documentation. Mazur (2000) agrees with Schriver, noting that there is little research to prove the measurable outcomes of a plain language approach. She cites van der Waarde's research of 330 documents, none of which followed the prescribed plain language guidelines, but all of which were still usable. Similarly, Duffy and Kabance (cited in Redish, 1993) found that short words and sentences used in documents could lead to improved readability scores, but did not necessarily make information easier to understand.

For the critics of plain language theories, it is the over-reliance on readability formulas that is the most problematic feature of this movement. Formulas including the Gunning Fog Index and the Flesch Test, predict the educational level a person needs to have in order to understand a given piece of written information. Arguably, readability formulas provide a quick reminder to writers to choose words carefully. However, in a broader sense, they fail to take into account of the wider usability concerns of a document. Critical concepts, such as the influence of design, accuracy of information, appropriateness of tone, and context in which users will interact with the information, are left untouched by the blunt instrument of the readability scale. And worse, these formulas also assume that the same

meaning exists in the text for all readers (Redish, 1993). Further, it cannot be overlooked that readability scales are designed and used for materials written in English by English speakers. They neither take into account, then, the global context of most contemporary communication contexts, nor the fact that in professions such as medicine, long Latinate terms may be needed in order to achieve an appropriate level of accuracy for the target audience.

In part, Mazur (2000) defends the plain language movement, describing its more recent approach to readability formulas as less pervasive, and discussing the work of later plain language proponents, such as Cuts and Baldwin (1999). However, Mazur also criticises plain language approaches for an over zealous adherence to the heuristics of grammatical correctness and document design.

Recent research supports the notion that the creation of successful or usable information is achieved by doing more than simply focusing on word size or sentence length. Campbell (1999) notes that reader comprehension was improved in a New Zealand study of the readability of bank documents rewritten in plain language. However, the rates of recall also surveyed indicated that readers in the study still did not really understand what they had read. Despite this, however, Campbell asserts that the plain language changes made to the documents were a worthwhile improvement on the originals (Campbell, 1999, p9).

While the plain language movement can offer contemporary technical communicators a reasonable theoretical starting point for thinking about users' needs, clearly, contemporary practitioners do require a much broader and more complex framework than this movement alone can offer. Users now expect *knowledge* as well as *information*, and while improving the comprehension levels of documents is helpful, it is only a small part in the overall process of creating usable information.

User-centred design

By the 1990s, technical communication in the US was recognised as a profession in its own right, and more importantly, was beginning to be a critical element within the product development process. The ascendancy of the technical communicator into the centre of development practice was driven along by the continuous demand from consumers for usable and understandable information. As well, highly competitive market conditions meant that good information itself became a key selling point for products and was, in fact, part of the overall marketing strategy. Many organisations began to see the value of having a trained technical communicator on their staff, and they also started to realise the high costs of not developing documentation as part of a product's life cycle and as part of usability testing. Interestingly, as Redish notes, 80% of costs that incur once a product is released are due to "unforeseen" user requirements and the costs of changes are 60–100% greater after the product has been released (Redish, 2000).

Over the last two decades, the largest market for technical communication products has changed from experts to non-experts and electronic products have flooded the market place. As Hayhoe explains it: "...over the past 20 years, the ability to communicate clearly to non experts using a variety of media and information types has emerged as the hallmark of technical communication excellence" (Hayhoe, 2000, p2).

Furthermore, this continued shift from expert to non-expert has meant that selling these products increasingly depends on bundling them together with effective and attractive instructional information. This seems to be the key element in a new phase of "user-centered design". Alan Cooper, from Apple (cited in Barnum, 2001, p3), describes this transformation in the user population as the "democratization of consumer power". In effect, the advent of the "silicon brain" in computing systems has made previously

hidden information or services easily accessible to untrained amateurs, who now no longer rely on experts to do the work for them.

One obvious example of this is seen in the proliferation of automatic teller machines (ATMs) that are slowly but surely replacing bank clerks. As well, Cooper goes on to describe the way that many people now prefer shopping online via e-commerce transactions rather than dealing with the "real thing" at the mall. However, he warns, "...if [a] Web site is a barrier to the successful completion of the sale, business will be lost..." (Barnum, 2001, p10), while Binstock says that consumers will always move to another Web site if the one they are using is not clear in its functionality, "...27% of all Web transactions are abandoned at the payment screen" (cited in Barnum, p10).

Clearly, it is no longer good enough for product developers to blame their customers for any problems with the comprehension of their supporting information. Rather, users' needs must play an important part at all stages of the product development process. Technical communicators, then, increasingly need to operate as user advocates in this process; voices for these emerging categories of non-expert users, who simply want to successfully utilise the tools and techniques now essential to modern existence. Some critics believe, however, that technical communication has been more reactive than proactive in responding to these changes to user demands and user profiles (Carliner 2001; Hayhoe 2000; Davis 2001; Shirk 1988). Shirk, for example, calls on technical communicators to create change rather than constantly wanting to reinterpret the past: "It is now appropriate for technical writers to join forces with their colleagues in Computer Science, on software development teams, and in academia for the purpose of creating new visual and conceptual metaphors for communicating effectively" (Shirk 1988, cited in Fisher, 1999, p2).

As consumers have demanded usable information, this pressure has made it crucial for technical communicators to create user-oriented information throughout the product development cycle.

Online Information

Introduction

Online information is the fourth key influence on the development and future of technical communication. Users want information and products that are intuitive to their needs, and they want to be able to access this information as and when they need it. Online technology means that information is becoming increasingly more accessible, and easier to store and disseminate than ever before. This section discusses:

- The growth of online information
- Single sourcing
- Future developments.

The growth of online information

In a recent article, Sless (2001) describes the ways in which contemporary culture is rapidly becoming information based, and how the relationship between an organisation and its public is more informational than ever before. As Sless describes it, "...moving, processing and transforming information..." (Sless, 2001, p2) is often the only visible evidence we have that organisations, such as banks, credit card companies, electricity providers or insurance groups, actually do exist. And while traditional manufacturing companies continue to rely on paper-based information products, such as instructions and manuals, to ensure that their products can be used appropriately, our wider reality is become increasingly online.

In Australia over 40% of the workforce is employed in positions that involve information activities (Sless, 2001, p2), and this figure continues to grow. Albers argues that the challenge for technical communicators in the new millennium will be to recognise and manage the fact that users really do not want *data*; they want *knowledge* (Albers, 2000). In this sense,

users will continue to demand information that enables them to learn, to solve problems and to carry out tasks in their real world situations. They will want well-designed information that is "actionable", and can be accessed easily in a clear and usable format (Sless, 2001). To meet user demands for accessibility and usability, these writers point to the online environment as the most likely means of delivering information.

Ring (2000, p1) goes further and predicts that soon the bulk of information will only be available online, and that paper-based manuals will rarely be used. The future of technical communication, Ring believes, will be driven by the increased use of the Internet, local radio links, e-books and DVDs, and the accessing of service organisations' information, such as banking products, online. Ring suggests that the greatest changes to come for technical communicators will be the movement of technical details and product handling instructions online, and the restriction of paper information to short hard-copy instructions such as warnings. Information products will require few if any words because DVDs and animation will provide all the visual information needed. Ring believes the new breed of technical communicators will come from backgrounds in game design, 3D animation, and television and video production.

Help design and knowledge management technologies are also important online information developments. Many users, long having given up on paper manuals, are now demanding dynamic online help to provide information and instructions. Online help systems are now being designed to help users at various levels of competency and tutorials and guides are available that are specifically targeted to meet individual user needs (Carliner, 2000a).

Single sourcing

Increasingly, single sourcing, or writing information once and using it many times in many different forms, is defining the future for technical

communication. Knowledge management, or "...the efforts to capture, store, transform and disseminate information in a useful context within an organisation..." (Carliner, 2000a, p13), is progressively driven by new XML or mark-up language products that enable single sourcing.

Rockley (2001, pp189-200) believes that single sourcing and e-publishing are the cause of a profound paradigm shift in technical communication currently taking place. With single sourcing, technical communicators are moving further away from those older craft and rhetoric traditions of the profession and closer to alternative ways of conceptualising information. One example of this change is evident in the growing application of information modelling now used during the planning and development process of some documentation. Modelling can be used to plan and create customised materials from a single source of data, and from there, be put online and made available for any designated user to select in whichever form they desire. In such online or single sourced documentation, information elements are "...referenced into the document for reuse or drawn from a database..." (Rockley, 2001, p189), rather than created from traditional genre elements, such as chapters or report sections. This means "...information elements (objects) can be identified for use in one output or another and reused where appropriate" (Rockley, 2001, p191). For instance, information about company procedures can be accessed from a single data source via the Internet, or downloaded as a document file, or used as staff training material. Advances in single source XML software, such as FrameMaker, AuthorWare, Doc-to-Help, RoboHELP, HDK, and AuthorIt, are making this "...just in time information based on user needs..." a contemporary reality (Rockley, 2001, p191).

Future developments

What about the future? Carliner (2000a) is optimistic about the role of the technical communicator in the future. He believes most world economies will continue to experience growth in knowledge industries, and this growth

will fuel a demand for practitioners able to create usable products, information, and associated materials. Already in America, the need for technical communicators outstrips supply, and salaries have increased accordingly. However, Carliner also warns that technical communicators "...who fail to develop expertise in...design and analysis, tools, project management and the use of media – will find their career opportunities increasingly limited even if the demand for technical communication remains strong" (2000a, p14).

Ubiquitous computing is an innovation that Zimmerman predicts will increasingly determine the future role of the technical communicator. Ubiquitous computing "...offers the user a world in which everything is a medium, because everything is or contains a computing device..." (Zimmerman, 2001, p3). Such devices already exist in the form of palm pilots, online instructions, or in the warnings and mechanical data read-outs in cars. But to work successfully, this information needs to be invisible, seamless, and fit the task so well that, in fact, it becomes part of the product itself. In other words, information products must become increasingly intuitive to their users' needs.

Noted technology commentator Nicholas Necroponte has also asserted that paper-based instruction manuals are obsolete and that intuitive machines make the best instructors: "Appliances of tomorrow should come with no printed instructions whatsoever (except This Side Up). The 'warranty' should be sent electronically by the appliance itself, once it feels it has been satisfactorily installed" (Necroponte, 1995, cited in Zimmerman, 2001, p215). It is this notion of the so-called "feeling machine" that will be at the centre of the radical tomorrow to come. Under these terms, the technical communicator will be, more than ever, the interface between product and user, charged with the task of "teaching" machines to understand and meet human needs.

Document design or information design?

Introduction

So far, an overview of the trends that have affected the profession shows that "technical communication" is fast becoming an inappropriate descriptor of the core competencies of the contemporary practitioner. Technical communicators are now sought after in many industries beyond the strictly technical, working in fields as diverse as marketing, training, usability testing, pharmaceuticals, environmental resource management, project management, education and finance (Frick, 2000). So, just as "technical writing" became subsumed as just one competency in a wider set of competencies, so too is technical communication itself fast becoming a subset of another discipline, that of information design. The following section of this literature review discusses two related disciplines that could offer a new professional profile to technical communication, and whose titles may themselves reflect the broader range of skills required by technical communicators now and in the future:

- Document Design
- Information Design

Document design

Schriver (1997) believes that the discipline of document design encompasses the core competencies that technical communication practitioners now need to be successful in their roles. She defines document design as, "The field concerned with creating texts (broadly defined) that integrate words and pictures in ways that help people achieve their specific goals for using texts at home or at school, or work" (Schriver, 1997, p10). Schriver argues that document design is a more appropriate discipline area for technical communication to align with, even if historically, it has been a rather rule-centred subset of technical communication. She notes that since the late 1980s, document design has moved markedly away from an association with purely text-based documents, and has been more concerned with examining the integral

relationship between information and design. Schriver suggests that advances in technology, digital animation and the Internet have effectively fused key technical writing skills with those skills traditionally associated with design.

Despite Schriver's support of this holistic approach to document design, she does not advocate a change of title from technical communication to information design, "Some designers of paper, online, or video artifacts prefer the term 'information design' because they view themselves as creators of information structures rather than of documents" (Schriver, 1997, p6). She believes that information design as a discipline is too closely aligned with the early communication theories of Shannon and Weaver to be completely appropriate as a professional designation. Shannon and Weaver's theories, where communication is viewed as an essentially linear transfer of information from sender to receiver, are too simplistic in Schriver's view. Citing Schutte and Steinberg (1983), she argues that the Shannon and Weaver model posits a passive audience who simply soak up information like sponges and do not interact with it in any other way. Information design to Schriver implies an information product that is packaged and shipped off to an audience who receive it and carry out its instructions without further thought.

Schriver argues for a more constructionist approach to information design, in which the actual design of a document becomes a complex interaction between the user and the writer or designer. The reader is an active agent throughout this process, and "...expert practitioners distinguish themselves by skillfully selecting, structuring and emphasizing content with the readers' needs in focus..." (Schriver, 1997, p11). Throughout this process it is assumed that careful audience analysis and usability testing has already established users' needs. Consequently, Schriver believes that the title for what technical communicators do needs to reflect a more complex

combination of the visual with the written, and must also reflect the interactive and user-focused context of this process as a whole.

Information design

In contrast to Schriver, Carliner suggests that information design provides a useful framework from which technical communication could readily broaden its designated field. However, he argues that document design alone is too limited as a discipline to represent what technical communicators actually do. Carliner describes document design as being based on the following equation: "Content + writing style + layout = document design" (Carliner, 2000b, p562), and asks where the user and the content plan figure in this formula? According to Carliner, the notion of information design looks at the bigger picture: "...what problem is the client trying to solve, what can they bring into play to address the problem and how does this solution support the larger business situation?" (Carliner, 2001, p562).

Within this same argument, Sless (2001) suggests that document design and information design are, in fact, synonymous. And more recently, Schriver herself has shown some doubt using about the term document design:

> Several years ago, I employed the term document design to describe the field broadly concerned with integrating words and pictures in ways that helped people carry out their goals for engaging with content. Although document design fit the situation at the time, a more inclusive term would capture what is going on today (Schriver, 2001, p7).

It seems that Schriver is right when she now says that document design is not an inclusive enough term for technical communication, because it does not represent the broader competencies needed in the contemporary manifestation of the profession.

The information design profession

Introduction

Since 1999, there has been a growing tendency for American technical communicators to change their professional designations to that of "information designers". Carliner (2001, p156) cites an unpublished survey conducted in 1997 of STC members that found that 50% of respondents would prefer to call their work "information design and development", while only 38% said they would prefer to call it "technical communication". The popularity of this change is also reflected in the growth of the STC Special Interest Group (SIG) concerned with information design. Membership of this group has reached over three thousand since it was founded in 1997. This section of the literature review examines the discipline of information design as follows:

- Definitions
- Graphic design or technical communication?
- A new profession emerges
- Approaches to information design.

Definitions

Information design has, until recent years, been the domain of graphic designers and, by and large, it has been heavily based on Kepes' 1944 premise that: "Visual language can convey facts and ideas in a wider and deeper range than almost any other means of communication" (Kepes, 1944, cited in Sless, 2001, p3). More latterly, the term "information design" was coined by the founders of the *Information design journal*, first published in Britain in 1979, in order to "...consolidate a community of interest – an invisible college – that had emerged in the 70's among a number of designers, teachers and researchers" (Mazur, 1999, p2).

The International Institute for Information Design (IIID) also reflects the influence of graphic design in its definition:

> The defining, planning and shaping of the contents of a message and the environments is presented in with the intention of achieving particular objectives in relation to the needs of users. At this point of the development IIID is concerned with the design of visual information but it could in the future include the design of other than a visual one (2001, p3).

And, while the IIID acknowledges that one of its aims is to use the potential of graphic information to reduce global social and cultural barriers, its definition does not seem to adequately address the fact that in order to achieve these aims, this emerging profession will require a more interdisciplinary or holistic approach than a visual or graphic focus allows.

In contrast, the following definitions seem to offer a refreshingly holistic approach to this area, representing contemporary information design in a way that values "...efficiency and effectiveness at accomplishing the communicative purpose" (Horn, 1999, p16). The first of these definitions comes from the STC and offers a definition that is inclusive of many disciplines.

> ...information design applies traditional and evolving design principles to the process of translating complex, unorganized, or unstructured data into valuable, meaningful information. The practice of information design requires an interdisciplinary approach that combines skills in graphic design, writing and editing, instructional design, human performance technology and human factors. (The Information Design Special Interest Group of STC, 2001, p10).

This approach suggests that technical communicators will continue to move into areas that have not traditionally been their domain, including projects such as public signage and government forms.

The second definition that interests us here comes from the Information Design Network (IDN). For this group, information design is about the clear and effective presentation of information that comes out of a multi-disciplinary approach encompassing the skills of design, writing, psychology, communication and cultural studies. This definition suggests

that information design can be used wherever complex information needs to be made more comprehensible.

The third definition that helps to shed light on this issue is Saul Carliner's: "Information design is a problem solving discipline that considers more than appearance but also the underlying structure of the solution of a communication problem and its anticipated reception by users." (2000b, p563). Carliner's definition, then, focuses squarely on the problem solving approach that must be the focus of contemporary information design.

Graphic design or technical communication?

As some of the definitions discussed above reveal, the graphic design approach still holds some dominance in information design today. Much that is written outside of the STC framework continues to focus on the importance of making information look good. Examples of this thinking include Schneck's comments (1999) on the "architecture of information" in insurance data, where the argument is established for multimedia programmes to display graphics at the expense of words, while Jacobsen (1999) believes information design is all about graphic and architectural theory simply applied wholesale to design products. Indeed, many companies in America who advertise themselves as information designers have a strong graphics focus.

In the same way, academic programmes in information design, such as the bachelor's degree programme offered at the Coventry School of Art and Design, England, also focus heavily on graphic design. There, technical communication is offered as a separate course. Malarden University in Sweden has a strong reputation for its information design courses, but these are located in the Product Design faculty. By contrast, Bentley College in America offers a programme that includes human factors in information design, e-commerce usability and elements of visual design and user documentation.

Wurman (1989 cited in Carliner 2001, p157) initiated a more multi-disciplinary focus in the field of information design. Wurman, originally an architect, likened his new profession to that of architecture. Organisations, Wurman asserts, should hire designers to design the structure of information just as they hire architects to design buildings. Already adopted by graphic design, library (information) science, usability and ergonomics communities, this architecturally based model is now being taken up by some in the technical communication field.

Surprisingly, key theorist and passionate advocate of graphic information design Edward Tufte (1990), believes that graphic designers have too much "real estate" on the computer screen. "The only reason people come to your site is to get information – not to admire your design. Programmers have the most control over space, then marketers and then graphic designers and finally content developers." Tufte calls this trend "content free design" (cited in Wyatt, 1999, pp1501-1502). According to Tufte (1990), new technological mediums delivering "information artifacts" need a combination of words and visual design to produce multimedia packages, CD-ROMS, interactive online training etc., as well as traditional hard copy manuals and documents.

The research surveyed within technical communication contexts generally agrees that a balance of good design and content is vital for information design. It shows that it is no longer enough to be a wordsmith, or a graphic designer, or technical specialist; an information designer must be prepared to be in control of the complete information process. The trend for technical communicators to redefine their roles as information designers appears to be a logical step to take as the profession adapts to meet rapid changes in technology and in audiences' needs for information. Delivering understandable, useful and timely information efficiently is the core business for technical communicators. As Cooper argues, information designers will be:

> ...a new class of professional interaction designers who design the way software behaves by developing a precise description of users and what they wish to accomplish.... Technical communicators are ideal candidates for these new professional roles, able to participate knowledgeably in a development process that starts with user needs and ends with engineering (Cooper cited in Zimmerman 2001, p6).

Similarly, Hayhoe (1998, p155) states that technical communicators must become "...masters of words, pictures and other media we employ in the information products we create for our users". Likewise, Carliner (2000) believes there is a renewed interest in content now that so many people have Web sites. He suggests that it is not so much writing or design that makes for quality content, but rather "...the usefulness of information to the target audience" (Carliner, 2000a, p14). And Hackos (2000) too has noted a move in focus from tools to content. She adds that technical communicators are now expected to add value to organisations and products through innovative approaches and cost savings implemented at the design stage. She argues that information designers now add value by ensuring the design and content are part of a seamless package for users.

Information design studies carried out by technical communicators such as Zimmerman and Schultz (2000) show the development of interest in the profession. Their study investigated whether or not information designers could create a document that would reduce the numbers of errors caused by incomplete data on forms used in a breast cancer-screening programme. The study compared the original form, designed by computer systems analysts, with one using the design principles of Schriver, Kostlenick and Roberts. Form users said the original had too many words, too many technical terms and not enough space. The information designers redesigned the form by capturing users in action, and then reproduced a form that out-performed the original significantly, and thus improved the accuracy of the information on the database.

Another study by Sless (2001, pp1-16) describes how the redesign of an Australian Telstra bill reduced the number of complaints that related to the design of the bill from 47% to 4%. This study concludes that information designers should be responsible for designing rule systems for the production of customised information. Meanwhile other practitioners and educators also agree that design must not overshadow information content. Wurman (1998, cited in Carliner, 2001a) agrees that it is important to make complex information clear and that design should be used to create maximum understanding, while Neilson (1999), a usability expert, stresses the importance of content in Web design, "Ultimately, users visit your website for its content. The design is there to allow people access to the content" (Neilson, 1999, p99).

A new profession emerges

While information design appears to be a popular title to represent the newly formed identity of technical communicators, it is not yet a fully integrated profession encompassing all of the contributing disciplines. It is important to consider what has forced many technical communicators to think of information design as a more appropriate descriptor for their roles.

Mazur (1999) believes the Internet is responsible for bringing information design into focus. Since there has been an uncontrolled rush to "web" information (Sless, 1999), users have come to expect less text and more visuals, quickly and efficiently. This rapid development in technology and the corresponding increase in information products has meant that technical communicators are no longer just wordsmiths; graphic designers are no longer just creators of attractive visuals; and usability experts are no longer just product testers. Rather, all strands of the information process must combine within the practitioner to ensure that information products are usable and efficient in solving communication problems.

Not surprisingly, tensions have arisen among the various strands encompassed within the designation "information design" that have resulted mostly from the "...clash of different ideologies or value positions that have grown up in the course of solving particular problems and have been extended to use beyond their original boundary" (Horn, 1999, pp24-25). Carliner (2001, p159) describes a great disparity between disciplines and aptly points out that, "...usability experts are from Mars, graphic designers are from Venus".

If these disciplines are so disparate though, is there a central unifier that can bring them together as a new profession? Horn's diagram (Figure 2.1 over) shows the diversity of interests and disciplines that are beginning to determine the shape of the new profession of information design (1999, p18). Central to all of these contributing disciplines, as Horn shows, is the development of a strong research base founded on cognitive science. Cognitive science research draws on the parent disciplines of computer science, linguistics, neuroscience, philosophy and psychology, and is arguably an ideal unifying influence for the profession, as many of the communication problems encountered within its scope require a similar interdisciplinary, problem solving approach, particularly with regards to the analysis of human and artificial intelligence.

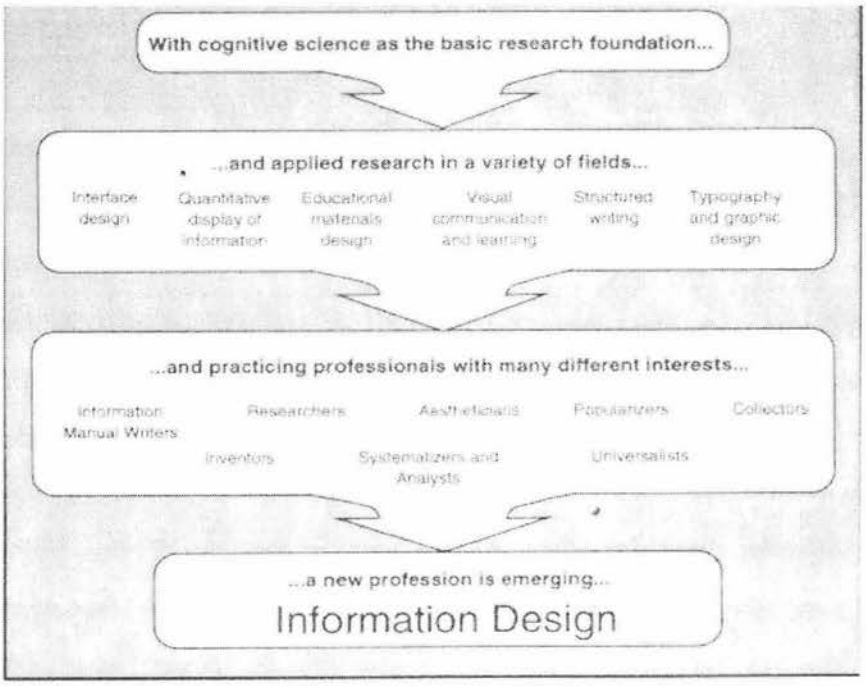

Figure 2.1: Cognitive science in information design (Horne, 1999, p18).

Approaches to information design

The literature surveyed suggests that there are three key technical communication approaches to information design:

- Human centred design
- Macro and Micro
- Interdisciplinary

Human centred design (HCD)

Cognitive science provides information designers with an insight into and understanding of how users interact with information and machines. HCD rejects prescriptive and mechanistic approaches to designing information products and technology, and instead emphasises the "..dominance of the user...", rather than "...render[ing] systems active and human beings passive..." (Cooley, 1999, p6). This notion fits with Necroponte's previously discussed assertion that instruction manuals are obsolete and that intuitive machines are the best instructors. As we have seen, new technology means that users need *knowledge* rather than *data*, and to achieve this technical communicators need to enter the world of the user. This is what

Coe argues when she writes, "Users inhabit their world; you and your information do not. They bring information into their world to read, use and apply" (1996, p3). Coe compares the way that information enters the world of the user as similar to the way in which we peel an onion: to reach the content, the user has to get through layers such as medium, navigation and presentation and hopes that the designer has controlled these facets seamlessly so that they can get to what they want to use.

To achieve this entry into the users' world, Coe (1996) advocates using optimal media, graphics, icons, chunking and navigation cues so that users spend less time reading the information, and more time assimilating and therefore, learning it. In her work Coe also describes how a knowledge of people's learning styles, their processes of memorising, and their approaches to problem solving can all affect the way a user will interact with a document.

Gestalt psychology has also played a part in uncovering how users view and use information. Gestalt theorists argue that users impose meaning and structure on what they see, and further show that if the structure of information is ambiguous or unclear, users will spend a brief time trying to get meaning but will then give up. They show that visual cues and structures, such as words and graphics, are essential for creating understanding.

Similarly, Schriver (1997) reinforces this need to take human agents into account when designing information. User thinking and feeling plays a crucial role in the way in which they interpret information. She argues that good design depends on making the subtext of information, or in other words its design structure, simple to navigate.

It seems then that reading processes cannot be separated from any discussion of the human factor within information design. Many studies

have been carried out on how people read texts. For example, Redish's work (1993) and Coe's work (1996) both discuss the importance of schemata, one of the most crucial aspects of reading that information designers must consider. In brief, schemata are defined as the networks and fragments of prior knowledge that readers use to interpret information. It seems that the more difficult it is to find links within a document to existing knowledge, the more energy a reader will need to use. And the more energy a reader needs to use, the less likely they are to persevere with it.

Macro and micro approaches

In another version of the holistic approach to information design Redish (2000) argues for an understanding of the distinction between the overall design process, or macro level of design, and the way information is presented, or its micro level. These two areas together make up the "whole" of effective information design. Redish reinforces the point that users, not information designers, should decide how much energy they want to put into trying to find and understand information, and this should be done using an iterative, rather than a "tack on" approach.

In a similar way, Hackos (1998) stresses that a project management or macro approach to online and paper-based projects is beneficial to managing usability concerns. In her view, design issues need to play an important part right from the start. She describes a tool for this approach in her model of the product information plan (PIP), whose function is to highlight the audience's needs, concerns, feelings, context and abilities throughout the wider information product process. Hackos' approach is still somewhat linear, however, and basically continues to assume that the traditional technical communication competencies of document development and document design are central. It really does, in itself, fail to represent an interdisciplinary approach to information design.

Interdisciplinary approaches

The most comprehensive approach to information design evident within the literature surveyed seems to be an interdisciplinary one. This approach encompasses all facets of the previous approaches, and includes disciplines as diverse as communication, education, HCD, graphic design, and business management within its scope. To illustrate, Jacobsen (1999 pp4-5) suggests that interdisciplinary information designers are not "...encumbered by traditional media limitations..." and are bound only by fields of meaning: "Each design rises or falls according to factors that are difficult to replicate: the setting in which the transfer of knowledge occurs, the individuals involved, the media employed and the original and ultimate purposes of producers and consumers" (Jacobsen 1999 pp4-5). But even more crucially, the interdisciplinary approach centres on a problem solving approach to the entire process of information design, rather than simply on end products and/or end users.

In particular, Pettersen (1999) describes a major change that has moved information design from the graphic design base of information products to a multi-disciplinary process encompassing at least fifty established disciplines and areas of research. These areas include research and practices from within the fields of linguistics, art, information disciplines, communication, behaviour and cognition, business and law and media production. As Pettersen puts it, "information design encompasses studies of the way a representation should be designed in order to achieve optimum communication between the sender and the receiver" (Pettersen, 1999, p2).

Interestingly, Pettersen's comments invoke the Shannon and Weaver's sender/receiver model that, as we have already seen, aims to minimise the mismatch between the intended message of the sender and the perceived message of the receiver. Using a contemporary version of this model, Pettersen describes a design approach to information products that

ultimately judges success by whether or not a product achieves its objectives. In this view, the sender's task is not complete until the information is designed in such a way that the receivers understand the message.

While Pettersen recognises the need for a multidisciplinary approach to information design, the association with Shannon and Weaver's model of communication limits his own analysis. For all of the same reasons previously offered here against the Shannon and Weaver approach, so too should we conclude that Pettersen's modern version of this model concentrates on "well designed" information material over and above the more complex aspects of usability testing and the iterative design process.

By some contrast, Carliner (2000b, p563) bases his reasoning for information design's need for an interdisciplinary approach on the premise that since information design is essentially a problem solving discipline, it needs to be able to make use of a range of skill sets and competencies: "It considers more than the appearance of the designed product but also the underlying structure of the solution and its anticipated reception by the users." He argues that it is not enough to consider graphics, text and user goals alone, but rather, that information must go the extra distance and consider the wider goals of the organisation that requested the communication solution in the first place.

Carliner's approach involves not only an analysis of core communication problems, but also the establishment of performance objectives and business or user goals; the measurement of tasks and the creation of plans to address those problems; the development and completion of the components of this plan; and finally, the evaluation of the overall success of the solutions implemented. To match this comprehensive task analysis, Carliner also discusses a broad range of core competencies that he believes information designers should master in order to carry out these jobs

effectively, including the ability to develop business plans; the ability to create user-centred designs; the ability to conduct usability tests; the ability to choose appropriate media and genres for the solutions required; and the ability to design screens and computer interactions. In addition to these skills, he also argues that information designers must be able to demonstrate competency in writing, editing, visual communication, speaking, preparing camera-ready copy, preparing simple code, and producing video.

In conjunction with this description of the interdisciplinary information designer's skills and competencies, Carliner (2000b, pp564-570) has developed a three-level model of information design. This model centres on the initial creation of a blueprint or goal-oriented framework to solve a communication problem. From here, each level of the model is focused on this blueprint.

The first level encompasses all aspects of physical design, or helping users to find information. This level is concerned with the issues associated with document design, plain language and other micro of layout, fonts, media selection and media production. The second level of this model is concerned with the cognitive field, or helping users to understand information once they have found it. By understanding how users process information, the designer can thereby minimise the effort needed for them to get that information at the right time and in the right place. Creative thinking and problem solving approaches are also part of this level. Finally, the third level of this model is affective, or concerned with motivating users to use the information and perform tasks. Carliner (2000b) believes that this level poses the greatest challenge for technical communicators who are often used to heuristic formulas for approaching design. Affective design is based on communication design and human factors such as getting a user's attention, motivating the user to use information,

overcoming the user's anxiety about trying something new, as well as language, cultural and ethical considerations.

The model is ground breaking for technical communicators and offers a new perspective on creating information products. It is based on an interdisciplinary approach, pays special attention to cognitive science and addresses many of the issues associated with single sourcing and online information. However, it does have limitations. No research has been conducted on its feasibility and its prescriptive nature seems to suggest yet another heuristic model.

The model also has implications for how information design should be taught. In association with this model, Carliner (2000b) describes an academic model for teaching these skills and competencies that does seem narrow and limited in focus. For example, at bachelor's degree level, only the physical process, or level one, is introduced alongside some elements of design; and it is not until Masters degree level that the cognitive design level is emphasised. At doctorate level, the focus is on competence in affective design. This model for teaching information design appears to overlook the importance of ensuring that graduates at undergraduate degree level have a broad approach to information design, as well as the ability to actually carry out the physical elements of the process. In essence it would be like training an architect in drafting skills only.

Carliner's model connects closely to Wurman's architectural analogy, previously discussed, especially in his use of the term blueprints. This analogy is also used by Rockley (2000) who describes one of information design's key roles to be providing a blueprint for single sourcing: "Information designers play a key role when the information types are initially designed. They are responsible for building the information models. The design of these models and accompanying templates facilitates the writing and assembly process" (Rockley, 2000, pp192-193).

The architectural analogy implies a reliance on rigid planning and related heuristics for the physical micro-elements of design. Alternatively, however, Christopher Alexander's work on pattern language (cited in Price, 1999) could offer a more creative problem solving approach to user-centred information design by also using some of the key principles of recent architectural theory. During the 1970s, Alexander, an architect, discarded the conventions of modernist architecture to develop a system for solving design problems that was fundamentally based on observing the repetitive patterns of the way people actually do things. From these observations, Alexander and the co-authors of *A Pattern Language*, designed a huge set of "patterns", or ways of resolving problems commonly faced by communities or groups, that they believed could be used to plan and develop better cities, communities and houses.

For information designers, this approach can also ensure that solutions are responses to questions raised by users many times over. They are, in this sense, truly user-centred. This is especially true in the single sourcing environment. Pattern analysis provides descriptions of each information object, as well as what sort of software is used, and in discussing this approach, Price concludes that, "the more information we must handle, it seems, the more likely we are to need patterns to help us create humane, aesthetically pleasing and enduring information objects for our users" (Price, 1999, p9).

While it is difficult to imagine information designers would have expertise in all of the areas Carliner (2000), Rockley (2000) and Price (1999) describe, there is no doubt that there is a current transition occurring between the mono-disciplinary technical communicator to the muti-disciplinary information designer. The question remains though, what direction will this take?

The implication of this transition on the careers of technical communicators and information designers suggests that they will be charged with the task of unifying the entire process of creating information products through their emphasis on and advocacy of usability. As we have seen in Carliner's research, the academic context has begun to shift in this direction, however, this shift is yet to be reflected in the job descriptions of the new information designer. Job advertisements still require writers and editors with specialised document software skills (Carliner 2001), rather than multi-tasking problem-solvers.

Summary

The research surveyed here shows that a profound paradigm shift from technical communication to information design is now in effect. As Zimmerman (1989, cited in Zimmerman 2001, p6) states: "The profession of writing is not a cultural absolute but a socially constructed reality with a history of development and change. Our jobs will not be what they were or what they are". These changes and shifts are evident in the rise and rule of new technologies over the past century. This initially saw the birth of the modern technical writer, who was able to translate complicated technical concepts into language aimed at a small and highly technically literate audience. As we have seen, the core competencies employed by this practitioner were centred largely on writing and editing, while the writer's key tools were primarily a sharp pencil, a note pad and a typewriter.

As technological innovations continued to develop, and later became increasingly available to general consumers, the technical writing profession also had to broaden its outlook and skills in order to meet the demand for user-centred products and information, and abandon notebooks and pencils in favour of the latest documentation software.

Correspondingly, the designation of "technical communication" was adopted in favour of the old-fashioned "technical writing", in order to

reflect the broader base of skills beginning to be employed within the discipline. These core competencies continued to widen and intensify, and were increasingly driven by users' real needs. They began to include a wider skill set, encompassing: notions of plain language, writing, editing, document design, usability testing and a varied tool bag of software skills.

The growing maturity of the profession, alongside the constantly growing use of the Internet, continues to drive the current shape of technical communication. Online information has traditionally been the domain of three groups: IT specialists, graphic design specialists, and technical communication specialists. The combination of these last two specialties into the new discipline of information design, reflects the wider need for a holistic approach to packaging information in order to create a usable message from all of the skill sets available. We can summarise the core competencies of a contemporary information designer as: having sound project management skills, being able to plan and develop business and performance objectives, being ready to develop and implement evaluations, being willing to develop user-centred designs, being familiar with a broad range of design and multimedia products, and of course, remaining competent and professional in writing, editing and visual communication.

Consequently, the literature tends to suggest that the title "technical communicator" no longer reflects modern practitioners' roles. Information designers, arguably our contemporary technical communicators, now have a broader range of competencies than ever before, and increasingly act as project architects, charged with solving complex communication problems presented by a range of project sponsors. And further, information designers will also play an important part in the single sourcing revolution now underway, as they will be increasingly responsible for designing the blueprints and patterns for the necessary information models in order to implement single sourcing solutions. As products become more and more

intuitive and finally evolve into the "feeling machines" that Nicholas Necroponte has predicted will transform our lives in the twenty first century people, information designers will be ultimately responsible for how users experience the information available to them about a product, no matter what the medium. In a hugely powerful way, information and information design will be transformed and transformative.

Methodology

Methodology

Introduction

The methodology employed in this study is designed to reveal the context and wider reality of the technical communication profession in New Zealand. The literature review establishes that significant changes are beginning to emerge in technical communication, especially in America, while the primary research presented here provides a basis from which to establish the state of contemporary technical communication in New Zealand, and then consider whether those same trends are also evident here. This comparative approach enables us to draw conclusions about the nature of technical communication in New Zealand and make some predictions about its future direction within the wider global context.

The literature review is based mostly on STC research. STC, based in America, is the largest international professional society sustaining technical communicators. The society actively funds and supports research by practitioners and academics, and publishes the results in peer reviewed journals and news groups. The society has special interest groups for different aspects of technical communication, such as usability, information design, international communication, and although the majority of members live in America, there is a growing international membership.

For the purposes of this study, a qualitative research methodology was chosen. The research was designed to gather information from New Zealand practitioners that might reveal both how they saw the reality of their present work, as well as the future direction of their work as technical communicators. The intention was not to gather facts and data about the objective details of technical communication in New Zealand, but rather to access coherent information regarding the reality of the profession from a practitioner's point of view. The qualitative research methods involved:

- Semi-structured interviews conducted with 25 New Zealand participants in May and June 2001

- Observational interviews conducted *in situ* in participants' workplaces in Christchurch, Auckland and Wellington
- Audiotaping, transcription and analysis of participants' responses.

The sample group chosen is representative of similar groups analysed internationally. At the time of the interviews, all subjects were employed in roles connected with documentation, and were also affiliated with a technical communicators' professional organisation. These are similar criteria for subject selection to that seen in other published studies. By using a semi-structured interview approach, it was hoped that practitioners would provide anecdotal evidence about their perceptions of the current and future directions of the profession in New Zealand.

A research assistant, a senior lecturer in technical communication at the Christchurch Polytechnic Institute of Technology (CPIT), helped with the interviews, taking notes and to clarifying any interview details as necessary. CPIT provided some funding support for the primary data gathering part of the project, regarding the information as valuable to their strategic goal to offer a degree in this area in the future.

This chapter is divided into the following sections:

- Profile of participants
- Interviews conducted
- Materials used
- Procedure followed
- Data analysis methods.

Profile of Participants

The following headings provide details of the profiles of participants:

- The sample of convenience
- Participants with professional association membership
- Geographical location of participants

- Gender and age distribution
- Employment
- Identification of selected participants.

The sample of convenience

A sample of convenience method was used to select participants for this study. Participants were chosen because of their affiliation with either the New Zealand Chapter of the Society of Technical Communication (STC) or the New Zealand Technical Communication Association (NZTWA). These associations provided the easiest way to access participants who identified themselves as either technical communicators or technical writers. Other methods of selection, such as randomly contacting companies with staff involved in documentation, were not used because it was the affiliation with the technical communication profession that was considered the key criterion for the selection of participants.

However, some "snowballing" of the sample did occur. Several participants recommended other suitable participants who were not members of either association but who also identified as members of the same profession. Consequently, four other people were interviewed who were not members of the above-mentioned professional associations

This sample of convenience does display some bias, representing only those participants who have an affiliation with technical communication associations and who were willing to participate in the study. However, the four participants interviewed who did not have such affiliations did not present information that differed widely from that of the other participants, and therefore, it can be concluded that professional affiliations seemed to make little difference to the overall results.

Rationale

As so much of the international research published on the topic of technical communication is based on STC findings, a sample drawn from its membership in New Zealand was seen as a further source of commonality within the study's parameters. Similarly, members of NZTWA form a similar profile to members of the STC in New Zealand. In fact, it was STC members, noting that potential members in the New Zealand profession might not be willing or able to pay the high American dollar STC fees, who set up NZTWA as an alternative body. These two associations provided an ideal source of participants this study, as members clearly identified their jobs with technical communication and technical writing. It was assumed that these participants would have a good knowledge about the development of their professions from their interaction with members of their professional associations.

The presidents of both associations were emailed and access was requested to their membership mailing lists. The president of the NZTWA was unable to give a mailing list as this was seen as confidential. However, she did contact members to get permission for the researcher to ask them for an interview. The president of the STC supplied the list of names and contacts of the New Zealand members. As contact details are published in the STC directory annually, the mailing list is not confidential. Her opinion about who to interview was valuable, as some members no longer worked in the profession or had changed address.

Sample size

The aim of the project was to interview thirty participants. Thirty was seen as a viable representative sample to give an indication of the trends occurring in New Zealand. The researcher did not have the funding or an "interview window" to allow a sample size any larger than this. However, the final sample size was reduced to twenty-five because of illness (the interviewer) and the unavailability of several participants.

Two Auckland participants were unavailable during the time of the interviews. Two Wellington interviews were cancelled because of the interviewer's illness. One Christchurch participant changed his vacation plans and was unavailable during the interview time. All participants, who were contacted as potential participants, agreed to take part. All appeared to be enthusiastic about the research and curious to know the results.

Participants with professional association memberships

Five NZTWA members were interviewed, including the NZTWA president. These participants lived in Auckland. Sixteen STC members were interviewed and included the NZSTC president. These members lived either in Christchurch or Auckland. Only one member lived in Wellington and he was unavailable for an interview during the scheduled interview time.

Other participants

Other participants recommended the remaining four participants who were not members of either society, but who did have a strong interest in joining. Participants gave the researcher the non-members' contact details.

The President of STC also recommended and gave contact details of two participants in Auckland who worked in banks. A Christchurch employer recommended two other participants in Wellington. Subsequently, both women were interviewed.

Geographical location of participants

The three main centres were chosen to give the best national representation of participants. Christchurch and Auckland have the largest membership for STC and NZTWA, and so provided the best source of participants. Both Christchurch and Auckland traditionally have more technical communicators than Wellington because of the higher number of electronic and computer software firms based there. However, Wellington

does have a number of people involved in documentation, especially in government departments.

Gender and age distribution

Gender and age were not a factor in determining the selection of participants. Participants were selected from the memberships according to who was available for an interview.

The sample group was selected randomly and included eleven men and fourteen women. In a larger study, it would be useful to select participants according to how long they had been in the profession. However, those selected included participants employed for over twenty years and new recruits (up to one year).

Employment

A criterion for selection was that all participants had to be employed in documentation. The type of documentation was not a factor in the selection, but the membership contacts did provide a selection of consultants and those employed by organisations. Participants were chosen because they were available and willing to be interviewed and were in the right location at the right time.

The sample selected included twelve consultants who owned documentation businesses and thirteen employees of organizations. Nine of these employees held team management positions. Only one participant worked in a government organization.

Identification of selected participants

Participants have been referred to by personal names throughout this report, and while their names have been changed, their companies and positions have not.

Name	Company	Title	Location
Moana	ASB	Team Leader Computer Based Training	Auckland
Jill	Dialogic Intel	Information Specialist	Auckland
Dave	Buckley Systems	Quality Assurance Manager	Auckland
Alice	ASB	Document Coordinator	Auckland
Rene	MultiSystems Ltd	Project Manager	Auckland
Rebecca	Writers' Inc.	Owner	Auckland
Chloe	Writers' Inc.	Rebecca's daughter	Auckland
Madi	Documents Online	Owner	Auckland
Adrian	Document Solutions	Owner	Auckland
Joyce	Document Solutions	Owner	Auckland
Sam	TechWrite Services	Owner	Auckland
Rod	Cardinal Network	Document Writer	Christchurch
Cyril	Allied Telesyn	Document Manager	Christchurch
Graham	Tait Electronics	Technical Author	Christchurch
Dawn	Trimble Navigation	Technical Publications	Christchurch
Win	Airways Corp NZ	Technical Writer	Christchurch
Tom	Treasury Sunguard	Technical Writer	Christchurch
George	Manaaki Whenua Press	Manager	Christchurch
Bruce	Technical Information Services	Owner	Christchurch
Matt	Avatar Promotions	Owner	Christchurch
Emily	Streamliners	Owner	Christchurch
Trudi	Tactics	Manager	Wellington
Perry	WriteUp	Owner	Wellington
Rochelle	Quality Web Content	Owner	Wellington
Tina	WordsWorth	Owner	Wellington

The interviews

Purpose

The purpose of the interviews was to find out what New Zealand practitioners actually did, in both a micro and a macro sense. Further, the

interviews were also intended to gather enough relevant information to make conclusions about whether or not the New Zealand profession is undergoing the same paradigm shift from technical communication to information design, as seen in the international literature. To achieve this purpose, the research methodology was designed to facilitate a richness and intensity of responses using an interview schedule comprising open-ended questions.

The interviews were conducted in each participant's work place. This gave the researcher an opportunity to observe the total context in which the participant was operating. Interviewing in the work place also had the advantage of allowing the participant to relax, to focus on the interview without interruption and to have documents and tools at hand if they wanted to provide examples or illustrations for their responses.

Other key benefits of using a series of interviews as opposed to, for example, a set of postal questionnaires, were that as long as the interview was carried out, a 100 percent response rate could be achieved; and that probing questions and clarifying responses could be used to gain more detail where necessary. However, one disadvantage of this method was that travel costs which made the project expensive to complete. The following section

- Lists the questions used and explains the rationale behind choosing each question
- Explains the schedule of the questions
- Discusses the pilot interview.

Research problems and rationale for related questions

Research Problem 1: What do New Zealand technical communicators do?

The following questions were designed to gather data on what New Zealand practitioners did:

- How do technical communicators in New Zealand define their job titles? Participants were asked: What is your job title?
- What tasks do they complete? Participants were asked: Describe your job.
- How do they spend their day? Participants were asked: Describe a typical day.

What is your job title?

The purpose of this question was to find out how the participants defined their roles, or how their organisations defined their roles. The question was expected to elicit a short response and to give the researcher some initial idea of the participant's perception of their role so that these could be compared with the trends in the literature review.

Describe your job

The purpose of this question was to find out what tasks the participants completed, whom they were responsible to, whom they were responsible for and their perceptions of the reality of their jobs.

Describe a typical day

The purpose of this question was to obtain a "micro" picture of the participants' daily tasks. Information was sought such as how much time was spent on documentation tasks, business management and planning and how stressful their jobs were.

Research Problem 2: What core competencies do technical communicators have, and which of these do they believe are essential to their roles?

The following questions were designed to gather data on what practitioners perceived where essential skills:

- What training have they had? Participants were asked: What training have you had to do this job?
- What training would they like to have? Participants were asked: What sort of professional development would you like?

- What do they believe are the essential skills needed to be a practitioner? Participants were asked: What are the essential skills that a technical communicator must have?

What training have you had to do this job?

The purpose of this question was to find out what qualifications and training participants had so that the background and competencies of New Zealand practitioners could be compared with those of their US counterparts, and in particular, to see if the trends noted by Staples (1999) of the changing profile of technical communication had any correlation with the profile of contemporary New Zealand practitioners.

An idea of the standard of training required to be a practitioner in New Zealand was also an aim of this question.

What sort of professional development would you like?

The purpose of this question was to elicit information on what skills practitioners felt were important for them to remain current in their jobs. This question was open-ended so that participants would think more broadly than computing tools.

What are the essential skills that a technical communicator must have?

This was the closing question for the interview. This purpose of this question was to gain a picture of what participants perceived to be the core competencies needed for the profession. Information from the responses to this question would be used to see if New Zealand practitioners describe themselves as having the competencies of technical writers, technical communicators or information designers.

Research Problem 3: How have their jobs changed and what future changes do they predict?

The following questions were designed to gather data on what practitioners perceived as past and future trends in the profession:

- How have technical communicators' roles and tasks changed since they first started in the profession? Participants were asked: How has your job changed since you first started?
- What predictions do they have about the future of technical communication? Participants were asked: Do you have any comments about the future of technical communication?

How has your job changed since you first started?

This question was designed to see if participants' roles had changed in similar ways to those of their counterparts in America to include more involvement with product developers, a move away from paper-based to online documents, and changes to their status and job responsibilities.

Do you have any comments about the future of technical communication?

It was logical to ask this question next as participants had just described trends in their careers and it would be relatively easy for them to carry on to predict future trends. The aim was to see if the trends New Zealand practitioners predicted matched those predicted in the literature.

Originally this question was preceded by "Where do you see your own position heading in the future?" However, after the pilot interview, this question was changed to keep the interview within the time limit.

Research Problem 4: What is the role of computing tools in practitioners' jobs?

The following questions were designed to gather data on what part computing tools played in practitioners' jobs:

- What computing tools do technical communicators currently use to complete their work? Participants were asked: What computing tools do you currently use to complete your job?
- How did they learn these tools? Participants were asked: How did you learn these tools?
- What changes in computing tools do practitioners predict? Participants were asked: What trends have you noticed in tools?

What computing tools do you currently use to complete your job?

The purpose of this question was to find out what computing tools practitioners were using to complete their tasks. This information would give an indication of whether or not tools used in the US and in New Zealand could be compared.

How did you learn these tools?

The purpose of this question was to elicit information about how technical communicators learned to use the tools necessary for their tasks. The information would also give some indication of what competencies technical communicators need to complete their jobs as well as providing their perspective of how important the use of tools was.

After the pilot survey, this question was nearly deleted because it seemed to be a question asked out of "curiosity" rather than directly related to the survey. However, it was retained because it was believed it could give an indication of how technical communicators updated their skills.

What trends have you noticed in tools?

The purpose of this question was to gather information about the future of computing tools in technical communication. This information would provide an understanding of whether or not New Zealanders were following the same American trends.

Research Problem 5: Are New Zealand practitioners following American trends towards redefining themselves as information designers?

No specific questions were asked about this research problem, as the other interview questions were designed to allow the answer to emerge. It was important that participants were able to give information without any reference to information design by the interviewers to avoid bias in their responses.

Are there any further comments?

This final question was asked to close the interview. It was added after the pilot interview was completed because the interview structure was closely focused on the core questions. Once the participants relaxed and were considering their role and tasks, other relevant information could come to mind that the interview did not cover or that they might like to add to previous comments.

Schedule of interview questions

Each interview question was designed to gather information to contribute to a specific area of the research problem. Interview questions were grouped in three categories. This structure was designed to provide participants with a logical structure for the interview and to allow the interviewers to swap roles. The interview questions were asked in the following order:

The role of the technical communicator:

- What is your job title?
- Describe your job
- Describe a typical day
- What training have you had to do this job?
- What sort of professional development would you like?
- How has your job changed since you first started?

- Do you have any comments about the future of technical communication?

The tools:

- What computing tools do you currently use to complete your job?
- How did you learn these tools?
- What trends have you noticed in tools?

Closure:

- What are the essential skills that a technical communicator must have?
- Do you have any further comments?

At the completion of the questions on the role of the technical communicator, the interviewers swapped roles from asking questions to taking notes and taping the participants.

Pilot interview

Once the test questions were formulated, a Christchurch practitioner consented to a trial interview in his office. The interview was timed (maximum time allowed 30 minutes) and problems noted. The only problem noted was that the tape recorder was rather weak and needed to be placed closer to the participant. This reinforced the importance of having a quiet room with no interruptions for each interview.

A decision was made to take notes as well as tape each interview in case the tape was of poor quality. Plans to make observation notes about the interviewee's work environment were deleted, as this was too time-consuming.

The following questions were deleted, as there wasn't enough time in the thirty minutes to ask these:

- What courses and programmes are you aware of that provide technical communication training?
- Where do you see your own position going in the future?

The importance of strict timekeeping was noted if all questions were to be asked. Participants were to be prompted only if it was felt that not enough information was given.

Materials

The materials required for the interviews included:

- Copies of interview questions
- Audiotapes
- Tape recorder
- Note paper and pens
- Watch

Further details of some of these requirements are discussed below.

Copies of interview questions

The participants were not given a hard copy of the interview questions before or during the interview. The researcher wanted to elicit their answers spontaneously to gain their first reactions and responses to the questions. However, the introductory email to all participants did outline the purpose of the interview (see Appendices 2,3 and 6 for information sent to participants).

Audiotapes

Each interview was audiotaped with the participant's permission (see Appendix 3 for consent form). A small portable tape recorder was placed on the table in front of the participant and as they spoke the research assistant took brief notes in case the recording failed. One Auckland participant could not be interviewed in person and, rather than lose the interview information, she agreed to a phone interview while the

researcher used a telephone-recording device. No handwritten notes were taken for this interview.

The research assistant was unable to travel to Wellington so few handwritten notes were taken. Fortunately the audiotaped interviews of the Wellington participants were all successful.

Procedures

This section describes the following:

- Timeline for research project
- Secondary research
- Primary research: conducting the interviews
- Data analysis.

Timeline for Research Project

Apr 2000	Original proposal for study submitted.
Aug 2000	Draft literature review submitted.
Sep 2000	Visit to Massey University to consult with supervisors Catherine Wallace and Craig Pritchard.
Mar 2001	Submission for permission for ethics approval to the Massey University Human Ethics Committee
Apr 2001	Presidents of STC and NZTWA asked for permission to use society members as recruits for interviews (See Appendix 5 for copies of email sent to committee chairs).
Apr/May 2001	Thirty possible participants selected and invited to participate in the research project. Emails included an attachment of the information sheet and consent form. Appointments for interviews were made once participants had agreed to take part.
Apr 2001	CPIT granted $2,500 towards the project from the Strategic Development Fund. This project was seen

	as the initial feasibility study for the Information Design degree proposed for 2003.
Apr 2001	Pilot interview completed and changes made to questions.
May 2001	Researcher and assistant travel to Auckland to conduct 10 interviews including one by phone.
May 2001	Researcher travels to Wellington to conduct four interviews. Ten Christchurch interviews completed.
July/Sept 2001	Tapes transcribed, literature review revised and submitted.
Sept 2001	Results analysed.
Dec 2001	Report completed and submitted.

The CPIT grant of $2,500 covered the following expenses:

Flight costs	Christchurch to Auckland and Wellington return
Accommodation	Auckland and Wellington
Rental car	Auckland and Wellington
Equipment	Tape recorder, tapes and telephone recording device
Incidentals	Meals, printing
Transcription	An independent person was paid to transcribe all tapes of the interviews.

Secondary research

The main source of literature consulted came largely from the Society of Technical Communication publications, including the *Technical communication quarterly*, and *Intercom*. As well, Internet searches were used to access other professional societies' databases, such as the Professional Communication Society of the Institute of Electrical and Electronic Engineers (IEEE), and the International Institute for Information

Design (IIID). Information Design degree programmes were also accessed via the Internet to see what core competencies were taught.

The publications database *ProQuest* was also used to augment other literature consulted.

Primary research: Conducting the interviews

Preparation

Each participant was sent an email to explain the purpose of the interview. They were also sent copies of the information sheet and consent form (see Appendix 3). Each interviewee was phoned to confirm the interview the day before the researchers made their visit.

At the start of each interview

The researchers introduced themselves and explained that the interview was going to take thirty minutes and that the participant would be asked approximately ten questions about what their job involved and what computing tools they used. Participants were told that the interview would be taped and that hand-written notes would be taken to ensure a record if the tape failed. Participants were told that the researcher would ask approximately five questions and the assistant the remaining five. Participants were told that they could stop the interview whenever they wished. The consent forms were completed and collected before the interview began.

During the interview

Questions were asked in the same order for each interviewee.

Completing the interview

The interviewees were thanked for their time and told they would be given a copy of the transcript and a summary of the findings by email when these were completed.

Data analysis

The interview questions were structured to elicit information that would achieve the project aims. Once the transcriptions were completed each interview was analysed using the questions as the headings for themes.

Qualitative software (NUDIST) was used initially to explicate themes and trends. However, it became apparent that it was easier to analyse the data manually rather than use NUDIST.

Results and Analysis

Introduction

The results and analysis offered in this study are a snapshot of the contemporary status and position of the technical communication profession in New Zealand. They uncover information not yet widely discussed in the research of the profession and industry here. The intention is not only to uncover this previously obscured information, but also to link it to similar studies carried out internationally.

As the review of literature has indicated, in America technical communicators' competencies of are changing from a focus on words, document design and computer tools, to a broad range of problem solving skills that include the practitioner at every stage of an information product's development. For New Zealand practitioners too, these trends are becoming reality. Unlike America though, New Zealand practitioners do not widely identify themselves as technical writers or technical communicators; instead they use titles that reflect the nature of their work. In this sense, this is a marked difference from the professional context in America, where traditional titles have tended to reflect traditional roles.

Therefore, this study argues that New Zealand technical communicators are information designers and are following the same professional trends as their counterparts in America. It finds that the main cause of this role change is the move from paper-based information to online information, and notes that practitioners now need a broad range of competencies, including skills in areas such as problem solving, usability testing, project, business management, writing, editing, software and interpersonal skills. It argues that practitioners no longer become technical communicators by default, but want training in information design competencies as well in traditional skills such as writing. Finally, it concludes that the future of technical communication in New Zealand will continue to evolve into

information design, particularly with the advent of single sourcing and multimedia tools.

Results and analysis of research problems

The results presented here are structured and analysed according to each research problem. The data from all interview questions is analysed according to its contribution to each research problem in the following order:

- What do New Zealand technical communicators do?
- What core competencies do technical communicators have, and which do they believe are essential for their roles?
- How have New Zealand technical communicators' jobs changed. What future changes do they predict?
- What is the role of computing tools in practitioners' jobs?
- Are New Zealand practitioners, like their American counterparts, now becoming information designers?

1. What do New Zealand technical communicators do?

The results for this research problem were derived from data collected from the following questions:

- What is your job title?
- Describe your job
- Describe a typical day.

And the main themes derived from the responses to this question are that:

- "Technical communicator" and "technical writer" are not widely used titles
- Job titles tend to reflect participants' primary tasks.

These key findings are further analysed under these thematic headings below.

"Technical Communicator" and "Technical Writer"

Titles such as "technical communicator" or "technical writer" do not appear to represent the actual roles of practitioners in this study. Unlike America, where, since WW2, the profession has developed in a particularly technology-driven way, in New Zealand the profession and its practitioners are not burdened by the same weight of history. In this sense, as relative latecomers to the discipline, New Zealand practitioners seem more able to forge their identities according to the tasks they complete, rather than having to define themselves by the traditional titles that tend to obfuscate what they actually do.

What do technical communicators do with their days?

Thirteen interviewees were employees of organisations and two of these organisations were solely involved with producing "information products" or documentation. Another eight interviewees worked in organisations that made products or equipment, including: routers, silicon chip manufacturing equipment, aviation parts, computer software, banking software, and navigation equipment. Two other participants were employed by banks, and another worked for a New Zealand government organisation. The remaining twelve interviewees owned their own documentation businesses; ten were sole owners, and two participants ran their businesses with a partner.

The job titles of 16 participants identified them as being directly involved with documentation or writing. Titles referring to documentation included:

Alice	Document Coordinator
Madi	Documentation Consultant
Adrian	Document Specialist
Joyce	Document Specialist
Sam	Documentation Consultant
Rod	Document Writer
Cyril	Document Manager/Team Leader

Other position titles that referred to writing included:

Win	Technical Writer
Tom	Technical Writer
Trudi	Mentor of Technical Writers/Manager
Chloe	Writer

Five titles included the word technical:

Graham	Technical Author
Dawn	Technical Publications/Team Leader
Win	Technical Writer
Tom	Technical Writer
Trudi	Mentor of Technical Writers/Manager

Three participants described themselves as owners:

Tina	Owner
Rebecca	Owner
Emily	Owner

Participants who were employees in organisations had a wide variety of titles such as:

Jill	Information Specialist
Dave	Quality Assurance Manager
Rene	Senior Project Manager
Matt	Director of Internet Company
George	Manager
Bruce	Journalist
Rochelle	Web Content Consultant
Perry	Business Communication Consultant

Of the participants employed by organisations, three of their titles gave no indication that their jobs involved documentation. However, all participants said they were involved in documentation, mostly as team leaders of documentation groups. These included:

Dave	Quality Assurance Manager
Rene	Senior Project Manager
Moana	Team Leader Computer Based Training

Dave's title, for example, was Quality Assurance Manager, but his job meant that he was solely responsible for the organisation's documentation, which he saw as being part of the entire process of product development and quality control.

Participants who had titles such as document specialists or consultants or managers were all involved in managing business and contracting work.

The only participants, Win, Tom and Trudi, who used the title "technical writer", were employed as part of a documentation team for organisations that made technical equipment, such as aviation engineering products and banking software. "Technical writer" was the advertised job title for their positions when they were first employed. At the time of the interview there was no intention to revise this title.

Titles tended to reflect participants' primary tasks

During the interview, some interviewees had to think about what their job title actually was, as they did not have a definite title. Their roles involved a variety of tasks not just documentation. This was especially evident for those involved at management level, such as Dave, or those running their own businesses, for example, Emily.

Company owners mostly used the title "consultant" or "owner". However, in most cases the names of their companies showed they were involved with documentation: WriteUp, WordsWorth, Technical Information Services, TechWrite Services, Documents by Design, Quality Web Content, Documents Online, Writers Inc. Other companies did not specify this documentation element, such as Matt's company, Avatar Promotions; and Emily's company, Streamliners.

Tina and Perry ran successful documentation companies. After prompting, they both agreed that "information design" was a better title for what their jobs actually involved. They commented though, that the most important thing about a company or role designation was that it told potential customers what their business was all about. New Zealand, they said, was just starting to recognise the importance of paying money to have professionals complete documentation.

Participants working as consultants believed using the title "technical communicator" would limit potential clients' perceptions of their services. More forcefully, Dave suggested that the title "technical writer" had negative connotations. As a Quality Assurance Manager, he felt that there was a stigma attached to this title that implies a very limited set of skills rather than being responsible for the entire process of quality design. He argued that it did not reflect management status and could not attract a management salary. This is consistent with Win and Tom's titles of "technical writer", which reflected their status as members of document teams rather than as holding managerial positions.

Tina, a documentation company owner, said that her business had struggled for a long time to find a name to meet the broad range of tasks they did and the skills they needed. She commented that her clients knew the company did documentation and training; if she used other titles, such as "information design" or "information architect", she "...might as well be talking to [her]self".

This study finds that the variety of job titles that emerged from the interview information, and the hesitancy by some participants to name their job titles, is consistent with the theme found in the literature that traditional position designations, such as "technical communicator" or "technical writer", no longer seem to reflect the competencies associated with the job. This is consistent with the paradigm shift discussed earlier

here that sees technical communication move from being a late-stage project "tack-on", to being synthesised into the entire process of a product's design and documentation.

Describe your job

The main themes derived from the data collected from this question are:

- All jobs involved documentation projects
- All jobs involved online documentation
- Consultants' and managers' job tasks were the most closely aligned to information design.

All jobs involved documentation projects

The technical communicators in this study were all involved with producing documentation. Their tasks were many, and varied according to their jobs and the level of responsibility they held. However, all participants' tasks involved writing documentation for specific users, products or services, and clients. The documentation genres they used varied widely, from training packages, to advertising material, to Web content to product manuals (see Appendix 1 for a summary of tasks). This clearly makes it difficult for organisations or employers to produce official job titles for people with such wide-ranging roles. Consequently, participants reported some difficultly in deciding upon, or agreeing to, an official designation.

All jobs involved online documentation

Another commonality among participants' positions was that all were involved in producing some form of online documentation, including training or software manuals, Web content and intranet materials (see Appendix 1 for a summary of tasks). Two participants were involved solely in Web design, and another described her tasks as being "...developer, designer and project manager to produce online documents for computer system clients". However, most participants were still involved in some

way with producing hardcopy documents like manuals, newsletters, brochures and training materials.

Consultants and managers' tasks were most closely aligned with information design

The skills of participants who were in management or consultancy jobs most closely matched the core competencies of information designers as described earlier in this study. These participants' jobs involved working beyond the scope of a regular technical writer, and moving into more strategic areas, such as documentation management. Managers of documentation teams, for example, Moana, Trudi, Cyril and Dawn, appeared to be fulfilling the role of an information designer by being responsible for document planning and completion. These jobs closely matched Carliner's (2001) core competencies for information design, encompassing such skills as: ensuring the documentation met user and client needs; developing project objectives and management plans; ensuring the product was user-centred and that the information within it was designed to meet all user needs.

Consultants consistently described business analysis and solving client communication problems as key requirements of their roles. This suggested that they had greater autonomy to work with a client on their specific needs than did their counterparts with fewer management responsibilities. Emily, for example, believed her main professional responsibilities were to trouble shoot or solve business problems, and to manage projects.

Further, this study found that consultants' and managers' tasks and skills were more likely to be transferable than those of other practitioners, and more likely to be able to meet a wider range of user, product and client needs. Tasks such as writing or graphic design were largely delegated to other skilled team members by these respondents. Cyril, for example, developed and controlled documentation projects in consultation with

product developers, designers, production and marketing people. He used the expertise of his team of writers and graphic designers to complete the documentation product.

Some consultants' work, though, began as "business as usual", where they were brought into an organisation to produce the manuals after the product had already been developed. However, once regular clients saw the added value to their product brought about by comprehensive, well-written and accurate documentation these consultants' roles changed and became more closely aligned to that described by the designation of information design.

All participants believed they had some input into the product development life cycle and documentation was seen as part of the quality assurance of the final product. For example, Rod, the port terminal software company employee, described his role as "adding value to the products produced".

However, participants who described their jobs as technical writers were more likely to be confined to working with the product and the information as it was presented to them. They seemed to have less part in the actual development process. These respondents' jobs matched the competencies associated with technical writing, rather than those associated with information design. Graham's job, for instance, as a member of a team of ten technical writers, focused very much on the end users' needs and he "fixed" problems associated with product documentation. Only one of these interviewees acknowledged the role of technical writer as a combination of quality assurance and technical writing. Team managers and consultants in these sorts of organisations mostly referred to their employees as writers.

Consultants and managers, then, more closely fit the profile of information designers than employed writers tend to. Consultants' and managers' tasks

covered a broader range of skills and were largely focused on solving communication problems for clients and their organisations.

A typical day

A typical day for the participants in this study was structured around the planning and completion of documentation projects to meet user requirements. The main themes that emerged here were that:

- All participants appeared to have well-structured days based on the needs of projects and clients
- Email information received in the morning played a vital role in daily tasks
- Multi-tasking caused some participants stress.

Well-structured days

Participants described their days as highly structured and they had a clear plan of the tasks that needed completion. The daily structure was dependant on the specific projects participants were involved with, and the main tasks described by participants were: answering emails, writing documents, attending meetings, researching information, conducting interviews, editing and monitoring projects and team progress.

Tina, for instance, had a highly structured day working with a core team of fifteen contractors and fifteen team members. At the beginning of the day, she found out where her team members were and what they were doing, so that if one of their clients phoned they could always be put in touch with their consultant. She also determined what needed to be done during the day and at the end of the day the staff regrouped to make sure projects were all "coming together". The company had a branch in Auckland and employed marketing people who all contributed to these daily briefings (by phone, email, or in person). The projects were structured around a project manager, a writer and a quality control person.

Allan and Joyce (sole operators) believed their days were not so highly structured, as they needed to be flexible to deal with projects on an individual basis. However, their days were structured around the projects they were working on; sometimes they would work 70 hours per week to meet a deadline and other weeks they would work around 30 hours.

Several participants were able to give a breakdown of the time spent each day on tasks. Rochelle described how she spent one hour dealing with email, a couple of hours of research and 4-5 hours editing Web content. She started most days 5am and worked for 12 hours. At the time of the interview, she was working on a lengthy project writing an article and writing online training packages for a bank. Moana said she and her team managed their own projects. She reported that putting together needs analysis of project work took up about 60 –70% of the day, otherwise she did other "bits and pieces", such as user guides, bank publications and intranet materials.

Email determines daily structure

Email has given technical communicators opportunities to become more involved with the entire product development process, providing instant feedback and quick responses to changes and problems no matter where the product is being developed or sold. Time zone differences offer New Zealanders favourable opportunities to complete international client requests and solve problems, often while the clients are asleep.

In the survey, email seemed to dominate most people's days and often this involved working with overseas companies or branches of their own companies. Jill, for example, described how important email "cross over" times with the US were during in her day. She sent sample code, reviewed any responses and liaised with international engineers all via email, while Cyril checked his email from company branches in Europe, Singapore and the UK first thing every morning. Dave's day was also determined by

emails received in the morning. The company dealt with clients in the US, the UK, Japan and Australia and most emails dealt with customer demands and complaints To these three respondents, email often formed the basis of their daily tasks, and they would often decide on their key goals for the day from this information.

Multi-tasking caused some stress

Some participants employed by larger organisations, appeared to be under a great deal of stress. The cause of their stress appeared to be the lack of recognition for the variety of tasks involved in their jobs; as well as a lack of understanding of how these skills add value to a product. Participants in such organisations were often doing the job of an information designer, and clearly had the competencies to increase the productivity of the company. However, their documentation products were generally tacked on at the end of product development, and their skills were not widely seen as integral to the design process.

In one example, Rod was working on ten discrete documentation tasks and was trying to organise a template design for them all. He described his job as huge; he had been working on it for a year and was only half way through it. Most of what he had done had had to be changed because of the lack of standardisation in the documentation of the various departments of his company. This proved highly stressful to Rod; however, he believed that single sourcing would be able to solve this problem, should he be allowed to implement it across the company.

George described his typical day as "frantic". He cleared four different email boxes (he had email addresses for different aspects of the publishing unit's business) and attended "lots of meetings explaining what his role was, showing visitors around and doing financial planning". Like Rod, George believed the company needed to make him a "separate unit", able

to work for the entire company. This would save the company time and money and prevent costly "re-inventions of the wheel", he argued.

2. What core competencies do technical communicators have, and which do they believe are essential for their roles?

The results for this research problem were derived from data collected from the following questions:

- What training have you had to do this job?
- What sort of professional development would you like?
- What are the essential skills that a technical communicator must have?

What training have you had to do this job?

The main themes found from the data collected from this question are:

- Participants had tertiary qualifications
- Participants became technical communicators largely by default
- Participants' technical communication training was mostly self-taught
- Technical communication is growing as an academic discipline.

Tertiary qualifications

The majority of participants had tertiary qualifications. Four interviewees had doctorates, one had a Masters degree, and the rest had bachelor's degrees or teaching diplomas. Only one participant did not have formal tertiary qualifications.

Many of the respondents held qualifications in the social sciences or the arts. 50% of them had majored in subjects including technical communication, English literature, foreign languages, journalism, drama, communication, linguistics, marketing, psychology, instructional design and philosophy. Around 25% of the subjects had science degrees, majoring in subjects like medicine, geology, health science, computing, mathematics, and mechanical engineering, and accounting. This finding is consistent with

Davis' (2001, p4) "snapshot" survey of technical communication Masters graduates in America, which found that the majority of students entering the profession had undergraduate degrees in the social sciences. On the other hand, however, Davis' survey found the majority of students surveyed were women, whereas in this study, 50% of participants were men, and six of these subjects had arts degrees. However, the small sample size of this study does not allow valid comparisons with Davis' study.

Technical communicators by default

Staples' (1999) profile of practitioners in America found a majority of the subjects surveyed became technical communicators by default. This is consistent with the findings in this study. Here the majority of practitioners surveyed had not set out to be technical communicators and they largely described themselves as self-taught, using phrases such as "hands on experience", "completely self- taught" and "I picked it up on the job" to describe themselves. Several interviewees were quite apologetic about their lack of specific training in technical communication. Cyril said he had "absolutely no training", Dave said that he had "training in the school of hard knocks" and Perry said he had "experience of business life that was essential to understanding client needs."

What is consistent with Staples' (1999, p7) profile of current technical communicators, however, is that these participants had a broad range of skills and could perform beyond the competencies expected of a technical writer. Perry confirmed this, saying there were no limits or boundaries (despite not having any formal training) to what he could do as a technical communicator, as the skills he had were transferable to most documentation situations.

Tina also described competencies beyond those of technical writing when explaining her experience of developing a process flow form for Telecom

that had taught her to use the "synergy of business analysts, documenters and trainers" in her successful business. This experience ensured her information products met the needs of all stakeholders in a project and avoided any "last minute disasters".

Growth of technical communication qualifications

In response to the increasing recognition of technical communication as a credible career path, several participants had gained technical communication qualifications. This trend is consistent with Staples' (1999, pp7-8) study that describes the shift from participants being technical writers by default, to increasingly being expected to be trained technical communicators first, and technology experts second. Two interviewees in this study had completed formal technical communication qualifications. Graham had completed a GDTC and Tom had a Bachelor of Technical Communication that he had completed in 1990 in England.

Tom described how he was in the first intake of a degree that was set up when his university was approached by local industry to produce graduates trained in technical communication, rather than those who had technical training in areas like engineering or computing and had then become technical communicators by default. Similarly, the GDTC was set up in 1996 at CPIT in Christchurch, New Zealand, at the request of local industry to meet similar needs for trained documentation experts. Graham and Tom both felt that their skills were very employable, while Matt and Pat were also completing the GDTC part time to give them better training to run their own businesses.

Five interviewees had completed "information mapping" courses through Trudi's firm, Tactics. Until recently, this has been the only short technical communication course available in New Zealand and they described it as being very useful.

What sort of professional development would you like?

Initial responses to this question drew replies like: "If only I had the money and time". In most cases, responses were further clarified by questions such as, "What sort of training would you like if you could have it?"

Participants all expressed an interest in further professional development. New computing technology was not high on the list for all interviewees' training needs, only twelve expressed an interest in this area. All interviewees had taught themselves to use the new tools in favour of attending training courses. However, all of them expressed an interest in gaining extra training in writing and business skills, whether they were running their own businesses or were employed by an organisation. The most commonly desired training areas were:

- Writing skills
- Business skills
- Technology skills.

Writing skills

All participants felt they wanted to learn new writing skills to meet the changing demands of online writing. Despite a move away from the long-held view of technical writers as "grammar doctors", participants were still concerned with ensuring that the content of their messages met audience needs. Cyril said that he thought writing skills were more important to learn than software skills, while Moana and Andrea said they wanted to learn "more on writing". Alice said that she needed courses on how to write online so that she could train other people and Moana wanted "stripped down writing courses" so that she could write for her target audience. Perry wanted specialist courses on marketing writing while Graham wanted to do an editing course.

Other desirable training that participants mentioned included, a Masters degree in Technical Communication, the GDTC, and usability training. Tina

was interested in setting future trends through studying the more about knowledge itself: "We focus on the information/content aspect but the behavioural/cultural things really interest me." She said she would like to study this concept to help people become more successful in their technical communication jobs.

Business skills

Participants also said they wanted business management courses, possibly because many of them ran their own businesses or were employed as supervisors. Rod said he was going to go on a business management course, while Rebecca wanted to do some "how to run a business" type training. Rochelle wanted "short sharp courses on business models" so that she could keep her "eyes and ears" on what was going on in the business world and take advantage of it for her own business, and Dawn wanted more management training for her work as a supervisor.

Some participants wanted to increase their skills by interacting more with their peers in the wider profession. Madi, Emily, Adrian and Joyce, who all ran their own businesses, wanted more peer contact through short courses, seminars, meetings and conferences on any aspects of technical communication. Emily said she would like discussion groups set up with her peers. These participants were not concerned that they would "steal" each other's clients. Adrian said: "There is so much work in Auckland: it is not a problem". Dave wanted more networking with peers and training as a quality assurance consultant.

Technological skills

Hayhoe (2000, p2) describes a key competency for technical communicators as being a "...healthy knowledge of software tools that can be used for a specific task". Participants' responses in this study were consistent with this trend. Twelve interviewees mentioned they would like further training in computer technology, and Tom and Graham said they

wanted "to keep up with trends". Matt wanted to do Photoshop, Dreamweaver, while Win wanted to do graphics and indexing courses, and Moana was interested in multimedia courses. Dawn said she would need to go to Australia to learn tools such as RoboHELP, while Rene and Rebecca wanted more XML and HTML training. Chloe, by some contrast, wanted to do "cheap community classes in visual basics and online tools".

What are the essential skills a technical communicator must have?

The participants in this survey consistently showed that they had the professional and personal attributes to ensure that they could meet the ever-changing needs of users. This study found that knowledge of computing tools was seen as the least important of all skill areas, as tools change rapidly and can be learned easily. In responses to this question, participants described a number of essential skills that went beyond those areas historically considered key to the requirements for working as a technical writer or technical communicator. The skill areas that participants considered as essential for contemporary technical communicators included:

- Problem solving skills
- Communication skills
- Writing skills
- Computing tools skills.

Problem solving skills

The most essential skill described by participants in this study was that of problem solving. This echoes one of the key competencies of information design as defined by Carliner (2001, p158). Participants saw themselves as the conduit between designers or marketers of products, and the product's potential users. While words and software tools were used to produce outcomes, there were seen very much as surface skills only when compared with the underlying skills of problem solving.

Communication Skills

Fifteen participants perceived empathy with the user as the most essential skill for technical communicators to possess. The ability to communicate with all involved in the documentation process was seen as vital by these respondents. Jill, for instance, believed she was responsible for finding out what the user wanted and then giving it to them. She said the subject matter experts (SMEs) and the marketing staff, "...don't give out that information, and you need to be able to play those ends against the middle and come up with what the actual users are going to want to see right up front". Perry's comments were similar to Jill's. He said that good personal skills were needed to be able to focus on the client's needs and understand their objectives, while at the same time, be able to express the users' needs. And Tom said it was essential to build rapport with other groups, such as developers who, from a technical perspective, were not necessarily good communicators. "You have to be proactive and you can't always rely on your training and always remain a user advocate". Cyril believed being an "entire person manager" was essential to interact with developers and marketing people, to ensure the customers were correctly identified and to get feedback.

Other personal skills mentioned by participants included: being an analytical thinker (6), being a fast learner (3), having interviewing skills (4), having a sense of humour (1), being a good team worker (1), having project management experience (1) and being able to meet deadlines (1).

Writing skills

Interestingly, many of the respondents did not immediately suggest that being able to write was an essential skill for a technical communicator. After prompting, most said they had assumed that this essential skill was obvious; as Tom said, "Writing is a given!". Several interviewees saw words as similar to computer tools or as visible elements of the bigger process of planning and design.

Win felt strongly about the need to be a good wordsmith before anything else. She described being a good writer as a feature of her personality. Moana said that writing skills were more important than software tools that could be picked up easily. "You have got to have a 'yen' for writing, otherwise, if you are completely hopeless, you will never pick it up". Emily said that those who have an interest and curiosity in writing could usually handle the tools.

Two participants described writing as the final output of the planning and preparation of an information project. Both Tina and Cyril commented that, as the final output, words were essential, representing the developer's vision of how a product worked. Cyril commented, "You make the user feel confident that if they need to know anything, it will be in the manual. Otherwise it will stay on the bookshelf and then why did we bother to write it?"

Computer skills

Knowledge of computing or software tools was not seen as an essential skill by most interviewees, but being a quick learner, having an aptitude for technology and being adaptable were. Tina described how important it was to learn the essential features of new tools quickly to deliver products to meet the user's needs. Perry said that aspects of technical production were important, such as understanding how words were going to be used on the Internet.

3. How have their jobs changed and what future changes do they predict?

The results for this research problem were derived from data collected from the following questions:

- How has your job changed since you first started?

- Do you have any comments about the future of technical communication?

How has your job changed since you first started?

The responses to this question showed that the Internet and computer technology have had the greatest impact on the participants' jobs. These have not only changed the tools that technical communicators use, but have also made the profession more visible as the demand for usable information increases. Participants' comments support American information designer Mazur's statement that the growth of the Internet has led to a rush to "web" information: "People can now expect less text and more visuals and being able to combine the two disciplines as one appears to be the trend for information designers" (Mazur 1999, p2). The responses from all participants, whether entry level or long-term practitioners, showed the following key changes to their roles:

- The change from paper-based documents to online information
- The recognition of technical communication as a profession that adds value to products
- A change in the core competencies expected in their jobs.

The change from paper-based documents to online information

All participants had found that their jobs required them to have an ability to produce more Web-based information than ever before. Trends noted in this study match those that Sless describes as occurring in Australia: "Our reality is changing from paper-based information to computerised media" (2001, p2). Rochelle said that "Web stuff" was the biggest change in her job. As she explained it, at first no one in her organisation had budgeted for Web writing, but once the importance of optimal Web visibility was realised, they would "flood" to her workshops. This was especially so for government departments, where teams were expected to use this kind of Web-ready information and team members needed to have some idea about how to create it.

Bruce, an American of over twenty years standing in the profession, saw the advent of the PC as the first big change in his role, followed closely by the advent of the Internet. For him the tools of trade had changed drastically from the manual typewriter to multimedia systems, but the power struggles have remained between technical writers, engineers and marketing people. He believed that the perception of the technical writer as grammarian still existed. Despite this, Bruce says that overall, technical writers have more power now than when he first started in the profession.

Both Rod and Cyril commented that changes in technology, such as online documentation and single sourcing, had made it cheaper and faster to produce information. Cyril, with had fifteen years experience as a technical communicator, described what he saw as a radical change from expensive photocopied product manuals to online product information. Now, the typical product has essential information on a small foldout flip card and lengthier information was all on CD-ROMs. The CD-ROM information is also available on the company's Web site and the help calls and printing costs have since diminished.

Madi also described how online information and tools had changed the nature of her business over the past fifteen years. She believed new technology had changed her job from being centred around a small, green screen and primitive word processing package that produced paper manuals, to using high powered software packages to produce online information.

The two newest practitioners interviewed, Chloe and Graham, believed the main changes in their jobs were also in the areas of tools and technology. While they hadn't experienced the change from paper-based documents to online information, they were also constantly trying to keep up with new online tools and processes.

The recognition of technical communication as a profession that adds value to products

Increasingly, it seems that organisations are beginning to see the value of having user-centred products and documentation. This has made the technical communication profession more visible in New Zealand, as it has also done overseas. Perry argued that the Internet had created a great demand for Web site content, while Bruce believed that it had increased the need for the average person to have information explained in more precise terms. George described his feelings about the need for user-centered design for Web information: "It feels as though I have stepped out of a cocoon and on to a highway. Everyone thinks they know what they want with Web stuff, some want animation, others just text." The key to user information, he believed, was not so much in having the tools but in knowing what people wanted and creating Web information to meet these needs.

Perry, Bruce and George all commented on the increased need for technical communication to meet the demands of a strong, consumer voice. These statements tend to support those of Alan Cooper, who talks about the "democratisation of consumer power" (cited in Barnum 2002, pp1-10).

A change in the core competencies expected in their jobs

In his interview comments, Bruce described a profession that was now much more sophisticated than when he had started working in the US. At that time, he argued, technical communicators were primarily involved with large-scale projects, such as documenting missile systems for the military. They were also predominantly male. Now, he said, the profession was 60% female, and had a much broader training and skills background. This is consistent with Staples' (1999) profile of today's technical communicator as a well-educated female, able to multi-task across a spectrum of information problem solving projects.

Two participants described how core competencies, such as chunking information and making sure the documents were designed for the appropriate contexts, had remained the same, but noted that the outputs had changed markedly. Rochelle said that although the tools and document delivery had changed, they are still using the same writing and planning skills. Emily also believed the principles remain the same, but that the medium had changed. She said she didn't believe that technology was driving everything; it had just changed the medium.

Do you have any comments about the future of technical communication?

In some cases, interviewees needed to be prompted to identify any future changes they could see in their own jobs. The most commonly predicted trends were:

- The impact of the Internet
- The growth in the need for technical communicators
- The need to be a user advocate
- The need for training.

The impact of the Internet

The most consistently identified future trend mentioned by participants was the growth and nature of information on the Internet. This growth was seen as having the potential to increase the employment opportunities for technical communicators. Participants described how new technology means that the tools for producing online information are becoming faster and more sophisticated. Online information is much cheaper to produce than paper-based information and this cuts costs for users considerably. As Cyril said, "information is power and that information is worth money". He described how users expected product information to be available on the Internet. Users expected the information to be available at speed so they could download manuals, see what the product did and even trial a "demo" product before buying a "key" to have access to it.

Perry described how businesses now provide information cheaper and more quickly on the Internet. The downsizing of corporate organisations and the growth of small businesses had meant that new businesses had a greater understanding of the importance of quality Web information in marketing. This information has had to be designed and updated, and this development was also generating more business for his company.

Adrian and Joyce said that the age of printed material is over, and that clients will do anything to keep the costs of printed material down. They saw this as being good news for their company, meaning that there is now more than ever an increased need to improve writing standards, and to ensure the usability of Web information.

Alice, involved with online training at a bank, said the future for her was definitely with Internet-based training, but as many of the bank's staff didn't yet have PCs with speakers, they were confined to employing a mixture of video and audiotapes for training packages.

George suggested that intranets were the future for technical communicators, and believed there would be a backlash against email and computer developments, such as e-Books.

The growth in the need for technical communicators

The future direction of technical communication in New Zealand, as overseas, seems to be limitless. Here, the profession is rapidly gaining recognition and the demand for technical communication graduates continues to increase.

Participants all supported the notion that the need for technical communicators will continue to grow to meet the increasing need for user-based products and information. Bruce said that there was an unlimited need for people who had a mixture of technical and literary skills; the

supply of these people needed to be addressed before it ran out. Matt believed New Zealand could take advantage of the world shortage of technical communicators. He argued that New Zealand, with its low exchange rate, also had an advantage over international competitors, as there was potential here to train people who could convey information on the Internet and, because of the time differences, get products to overseas clients more quickly than from elsewhere. Win saw technical communication as offering one of the best career paths for the future. She believed that as the need and cost of well-designed online documentation rose, the number of technical writers would also need to increase.

Being a user advocate

The potential for technical communicators to ensure quality online information able to meet user needs was a consistent theme in this study. Participants saw their skills as user advocates playing a key role part in the future product development cycle. Tom, for instance, described the future role of the technical communicator as "the conduit between software developers, designers and users". Technical communicators must, he believed, also ensure that information is well structured and user-focused. This theme is consistent with Carliner's belief that it is not so much the writing or design that makes quality content but more "the usefulness of information to the target audience. Content should be smart and anticipate users' needs by putting the information in a usable format" (2000a, p14).

Other participants' responses supported this theme. Sam described an information design approach to solving the communication problem of satisfying the needs of developers, users and company business goals. He believed technical communicators could act as business analysts or project managers to ensure all product information is designed to be understandable and usable.

Adrian and Joyce also believed that in the future it would be crucial for technical communicators to work closely with developers. This process would enable practitioners to have a view "of the entire system and we can spot things that need streamlining".

Some participants expressed frustration at not being included in this design process by organisations that saw the technical communicator's job as useful only at the end of a project. This theme is consistent with the changes in core competencies that are described in the literature review. Participants mostly have a much broader base of competencies than generally encompassed by the designation "technical writer". In some cases, though, these competencies are not recognised, especially for those practitioners employed by organisations.

Jill described the importance of the development of user-centered design for information and products. She saw usability as a necessity, as products in her company were not always designed with the users in mind. Often a product was designed because it was seen as a "groovy" idea rather than being driven by user needs. She advocated the need for technical communicators to be part of the entire development and design process and ensure a match between the product and user needs.

And Rod hoped that in the future, his organisation would use technical communicators to integrate supporting online documentation into the product development cycle. He believed that as product development got faster, there was little time to ensure the final product met user needs. He argued that by involving technical communicators early in development, the company could ensure the product was what the user wanted.

A need for training

Technical writing training was another trend that interviewees saw as important. Alice was adamant that the way writing was taught in schools

was not useful training for the profession and often documents needed to be rewritten many times at considerable cost to the clients.

Tina said that although the profession had much more recognition now, more training was needed to move away from the "boffin" image. "We must invest in training and writing. For every person I have hired, I would have interviewed six."

4. What is the role of computing tools in practitioners' jobs?

The results for this research problem were derived from data collected from the following questions:

- What computing tools do you currently use in your job?
- How did you learn these tools?
- What trends have you noticed in computing tools?

What computing tools do you currently use in your job?

The most common tool used by participants in this study was the Microsoft Office suite, but the most favoured tool were those, like FrameMaker and AuthorIt, that made single sourcing and the wider design and management of information projects possible. Participants' responses revealed the following themes:

- Microsoft Word is the most commonly used product
- FrameMaker is the most favoured tool
- A range of Internet tools and design tools is used.

Microsoft Word is the most commonly used product

All participants used the Microsoft Office suite of software to produce documents. This was not because they necessarily thought it was the best tool but because it was consistent with what the majority of clients and customers used.

Participants running their own businesses described the Microsoft suite as the standard client product. Emily, for instance, used Word so that clients could manage their own documents once she finished developing them. Bruce said that most of his clients accepted only Word documents. Trudi described how in her business, they were constrained by the standard software in a company and Word was most often used because of this.

Not all participants believed Word was the best tool: Rochelle described it as "primitive". Perry said that Word was "pathetic" compared to FrameMaker.

FrameMaker is the most desired tool for documentation

Adobe FrameMaker was by far the most popular tool for producing documents. FrameMaker, a software package that is basically an authoring tool, allows a single source of information to be used in a variety of multimedia channels, such as CD-ROMs, print, Internet and online help. FrameMaker enables technical communicators to gain more competencies than just technical writing, as it is dedicated to all aspects of information design, from managing page layout, to choosing fonts, to managing files, to planning documents, to bookbinding.

Cyril described FrameMaker as the key tool used by his team of technical writers, who could be responsible for doing everything, "including getting the content into the final document, layout and paragraph styles".

Four interviewees who ran their own businesses used AuthorIt. This is a relatively new software product made in New Zealand and is considerably less expensive than FrameMaker, although it offers similar features, especially single sourcing capabilities.

A range of Internet and design Tools is used

All interviewees used some type of software to produce online documentation. The most frequently used Web design tool was Dreamweaver, used by eight interviewees. Others used products such as HTK Help, Doc-to-Help, Authorware, Adobe Acrobat, RoboHelp, Flash, Fireworks and FrontPage. These tools enabled them to write online information quickly with relative ease.

Interviewees also used software packages for document design. Packages included SnagIt, Visio, Photoshop and, Corel Draw. Dave used a digital camera for his work and PowerPoint for business presentations.

Where did you learn the tools?

The most consistent themes derived from participants' responses were:

- They were self-taught mostly
- Software training courses were not useful.

Self-taught

As the literature reviewed and the results of this study suggest, it is no longer enough to be a good writer. Keeping up with the rapid increase in new technology for writing and delivering information has meant that technical communicators have had to learn the new tools fast enough to enable them to perform their jobs more efficiently and meet the needs of clients and users. Participants learned the software features when they needed to complete a specific task. Only those features that were necessary to complete a task were learned and the manual was consulted as a "last resort" after colleagues and friends had been consulted.

For instance, Chloe and Rebecca said they learnt Microsoft Word by completing projects or asking colleagues and friends about the tricks of the software package they were using. Graham, Adrian and Bruce resorted to using software manuals after they had played with the software first.

Manuals and "Dummies" books were used if there was a tight deadline to complete a project. Sam and Moana used their self-taught processes to develop their own training programmes for clients and co-workers.

Software training courses were not useful

Training courses were seen as an ineffective way to learn unless the training was one-to-one and directed at solving specific problems. Most courses seemed to give the participants information, but what they really wanted was to know how to complete specific tasks.

Participants who had been on short courses mostly found these of little use; however, Emily had solved the problem of getting useful tuition directed to her project needs by employing a trainer to come to her business and do a one-off two-hour private training session to teach her the specific features of the software that she needed.

Cyril believed he couldn't justify spending money on staff training courses for his team and that if the people in his team were "smart enough" to be technical writers, they would know the basic skills or be able to teach themselves. He thought that buying the appropriate manuals was more cost-effective. Tina and Trudi, who both ran documentation companies, described the way their employees shared their knowledge of the tools in regular meetings, but once again they were all largely self-taught.

What trends do you predict in computing tools? Single sourcing

Twelve participants believed that content and knowledge management tools, such as single sourcing software, were the trend for the future. Managing information using single sourcing technology will mean that the technical communicator will be more responsible for the mapping of information that will increasingly used to meet the needs of multiple audiences using multimedia technologies.

Participants described single sourcing as being advantageous in reducing time, effort, costs and errors. Information that was similar in content could be presented in different ways. For example, in a paper-based document, graphics may be appropriate, but online they may not be relevant. Up until now, technology has not been flexible enough to allow technical communicators to present similar content. Both Cyril and Dawn, who worked in organisations producing a variety of technical products, mentioned how they needed to manage information more efficiently so that they didn't have to redo the same content for different purposes and mediums. Rod also expressed a desire to have a more consistent method of managing his company's documentation that would allow him to redo similar content and templates using different media, but without having to redo the entire document using a different tool.

Private consultants all mentioned the use of single sourcing tools as the new direction to replace tools like Microsoft Word that do not allow multiple uses of the same content. The use of single sourcing tools will be even more important as clients' needs for document management processes grow.

New single sourcing technology using XML products, like FrameMaker and AuthorIt, are becoming more sophisticated and will allow technical communicators to have more opportunities to design information in a variety of mediums to meet the needs of their users. Cyril also said that version control tools, where copies of every source file ever generated are retained, would be essential in the future. This would mean that any version of the document could be rebuilt, compared and differences noted.

Rebecca also said the future was with single sourcing products that used XML, and with intelligent databases. Jill confirmed this. She said that for her company, there was a need for knowledge management on the Web. Dave added to this, suggesting that better e-books and more usable

methods of file compression would also be the way to deal with volumes of information in the future. Others mentioned developing intranets as a way of handling the demands of document management.

Online tools

All interviewees said that more tools for online information would be developed in the future. Online tools are becoming more intuitive and usable and this means participants had more time to concentrate on content and information design than on outputs, such as words and document design. Chloe summed this up by saying that online tools were making it easier to produce documents because, "you don't need to worry about page numbers, headers, footers, etc. So you don't need so much technical knowledge now to produce a document."

Rene said that in the future, 90% of her work would be online, and that the style of writing would be more concise, with graphics replacing many of the words, hyperlinks and layered pieces of information. Moana also thought the use of Web-based tools, hyperlinking and graphics would increase.

Tina said that she could see a growth of intranets within organisations. She thought there would be new Web-enabled tools and new versions of current software, as well as a worldwide consortium of Internet standards that will keep "tabs" on the standards of Internet information. Tom thought that Web browser tools would become more intuitive and that there would be more development of graphics tools.

5. Are New Zealand practitioners following the American trend of redefining themselves as information designers?

No specific questions were asked about this research problem, as the other interview questions were designed to answer this summative question. However, the following closing question drew two responses:

Are there any further comments?

Tina and Emily were the only interviewees who responded to this question. Tina's response focused on technical communication as an excellent career. "It is a long-term career path – start as a writer – get into performance support and then management. I don't know many people who after three years go, "Woo hoo! I'm going out today to write a user guide". And Emily spoke generally about the amount of work that was available for consultants in Christchurch. She said that new technical communicators should know how to create style sheets and how to produce templates for documents.

Summary

The themes from the results of this research are consistent with the themes in the literature review. The practitioners in this survey are undergoing the same paradigm shift identified in the literature review from being technical writers or communicators to becoming information designers.

The future of information design in New Zealand is following the trends of the US. The increased need for information, especially online, means that the profession is growing rapidly. Perhaps New Zealand practitioners are more fortunate than their colleagues in the US, who have a longer history and consequently a stronger public perception of what their jobs involve. New Zealanders can use their flexibility, talents and communication skills to forge their own identity.

The core competencies of the participants, though, matched the themes for the core competencies of information designers in the literature review. So, while participants were not calling themselves information designers or technical communicators, they demonstrated a broad range of competencies that were consistent with those of information designers. These competencies included knowledge management, familiarity with

single sourcing and online documentation tools and user advocacy. All interviewees stressed that personal attributes, such as problem solving or being able to learn quickly, were essential skills. They also acknowledged the importance of good writing. Computer tools were not seen as an essential competency, but being able to learn to use complex technology quickly was. Participants demonstrated that they were not just wordsmiths concerned with tools, words and final products. In fact, they were mostly information designers and problem-solvers. They gathered and analysed information from all major contributors and users of the product and used specific tools used to complete projects in such a way as to meet the needs of the target users. They were largely involved in an iterative information design process, working with other design practitioners throughout product development, avoiding the undesirable scenario of creating documentation tack-ons. The following diagram sums up this process:

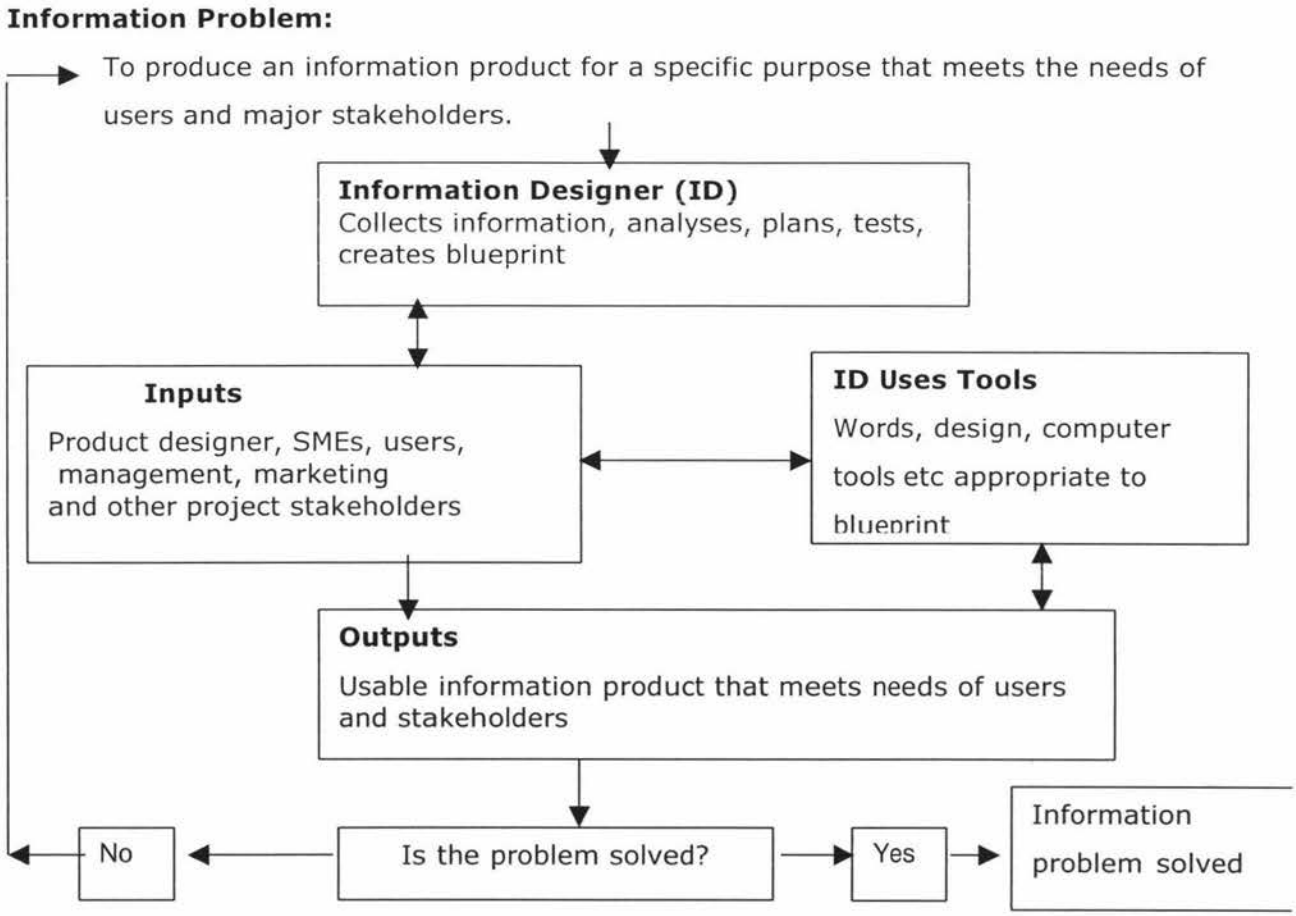

Figure 4.1: The information design process.

Conclusions and Recommendations

Introduction

This research concludes that technical communication in New Zealand is currently undergoing a similar paradigm shift to that discussed and analysed in the international literature reviewed in this study. The results of the primary data here also indicate that New Zealand technical communicators have the core competencies of information designers.

All participants who took part in this study were obviously adapting to these changes in their own roles. Without exception, the participants showed that they were not only aware of the transformations occurring in technology and in users' needs, but were also aware of the importance of being able to adapt to, and cope with, these changes. Yet, the interviews also showed that the day-to-day basics of being an effective technical communicator were still contingent on the practitioners' abilities to write, design, manage user needs, test usability, and develop software expertise.

The findings

The following themes draw together the findings from the five research problems explored in this study, describe some of the commonalities among participants, and show some of the developments occurring in technical communication in New Zealand:

- New Zealand technical communicators are information designers
- A broad range of competencies and tasks is demonstrated
- Online information redefines roles.

New Zealand technical communicators are information designers

The results of this study show that the profile of practitioners interviewed matches that of information designers. However, within this we must also conclude that traditional American job titles, such technical writer, technical communicator, and information designer, are all somewhat limiting and confusing for New Zealand practitioners and their clients. This conclusion reflects a wider lack of recognition about the profession in New

Zealand, compared with its long history in the America. In this sense, New Zealand practitioners may actually be able work more dynamically across disciplinary boundaries than their American counterparts have been able to do to date. This in turn, may allow New Zealand technical communicators to forge a different kind of role definition for themselves as well.

What is most important, however, is that practitioners use a title that fits the description of the job they are doing. The title must be easily recognisable, and reveal something of the actual tasks that they perform regularly. Designations, such as "document specialist" and "information specialist", are probably more recognisable to New Zealanders than "technical communicator" or technical writer", and indeed, the word "technical" gives a rather limited indication of the broad range of information that practitioners, especially those work in management or consulting, deal with.

As indicated, consultants interviewed found it difficult to name their companies in such a way that this broad range of tasks and skills would be recognisable to clients. It seems that in the end, the choice of a company name mostly reflected the nature of the work undertaken and was designed to make it obvious to potential clients what the company did.

Not all participants who were employed by organisations were sure of their titles. For others, the title "technical writer" was considered to have negative connotations because it described a limited set of skills and did not reflect the entire process of quality design and document development. So, while New Zealand practitioners are doing the tasks of information designers and technical communicators, they do not always identify with these titles in their jobs. In fact no participants used the titles information designer or technical communicator. However, the participants in this survey all had an affiliation with either the NZTWA or STC showing that this was the profession they most closely identified with.

New Zealand may never recognise the title "information designer", however, professional titles used here will probably continue to reflect the relationship between practitioners and their stakeholders' needs.

A broad range of competencies and tasks is demonstrated

The study concludes that participants interviewed had the competencies and completed tasks consistent with those of information designers. The competencies participants described matched those in Carliner's definition (2000, p563): "Information design is a problem solving discipline that considers more than appearance but also the underlying structure of the solution of a communication problem and its anticipated reception by users". Furthermore, their ability to produce quality documentation is now being acknowledged as cost-effective and intrinsic to the design process, rather than being an expensive "tack on" at the end of a project.

However, the roles of both managers and consultants clearly went beyond those of a technical communicator. These roles most closely match the core competencies of the information designer as defined by Carliner, in that they involve analytical thinking and problem solving skills, as well as the ability to design user-centred documents. Participants who least matched the profile of information designers were employed by technical companies and were called "writers".

In general, the New Zealand practitioners interviewed did not tend to be involved with producing the traditional outputs of technical communicators, such as completing highly technical manuals for specialist users. They were much more likely to be found working as part of a planning team within a process of product development; or involved in strategic information management. However, in all cases, the common goal of participants was to produce documents to meet users' needs and to satisfy a project sponsor's needs. Participants saw their role as being a conduit

between the product designer or engineer and the target user. The flexibility of their skills meant that they could meet a wide range of user and client needs.

Participants in the study were also consistently highly educated. The majority had degrees, mostly in the arts. This is in line with international trends where a practitioner has "...at least one college degree and works, if not in a technical industry, then certainly with an increasingly wide and sophisticated range of communication technologies" (Staples 1999, p7). Technical communicators and information designers, however, do not necessarily need technical product knowledge to be successful.

The results also show that there is a need for more professional training in New Zealand, particularly around the competencies of business management and specialised writing. All participants wanted further training, particularly in writing and business skills, and indicated that they placed a higher value on their ability to produce quality information, rather than being skilled and able to fulfill a technical role. This is also consistent with the theme that information designers are communicators first and technicians second.

Participants also valued communication skills, describing the following attributes as being highly desirable: having empathy with a user, communicating successfully with all stakeholders, analysing user needs, solving communication problems, managing the development and design of a project, and setting goals and outcomes to satisfy business and user needs.

The traditional core competencies of technical writers and communicators such as, document design, computing tools and audience analysis were still important but were seen as subsets of skills. Knowledge of tools was seen as the least important attribute, since tools change rapidly and can be

learned easily. However, the ability to learn new tools quickly to deliver products to meet a user's needs was seen as an essential skill.

The fact that the practitioners interviewed saw good writing as a "given" reflects a shift in focus from wordsmithing to broader kinds of competencies within and around the documentation process. However, writing remains an essential skill and, as the results of the study show, one that requires ongoing training.

Online information redefines roles

The results conclude that the core competencies needed for contemporary New Zealand practitioners' jobs are shaped by the changes from paper-based to online information. As online information has become more accessible and easier to produce, users now require content that can be adapted to a variety of mediums. New Zealand practitioners, like their colleagues in the States, are already using single-sourcing products to produce online information to meet these needs in the move away from paper-based products.

All participants were familiar with current online tools and were generally self-taught in their use. They saw single sourcing tools as a promising trend that would increase their potential as information designers across a range of media. Many participants already used single-sourcing products and this was probably the greatest "tool" change in their jobs, and, with the increasing need to manage large volumes of material cheaply and efficiently, was already redefining jobs.

One consequence of the demand for online information was that it made the profession more visible. The demand for technical communicators is growing quickly and is outstripping the supply of trained practitioners. Furthermore, the study highlights New Zealand's unique position in being

able to take advantage of online access to the overseas market potential because of our favourable exchange rate and time zone differences.

This study concludes that New Zealand practitioners and academics must take advantage of the continued growth of this emerging profession and forge a clear identity for professionals working within it. The opportunity to shape the future direction of this field is limitless as there are no traditional disciplinary rules and structures to adhere to as yet. The following recommendations provide guidelines for how this could be achieved.

Recommendations

No formal research on the profession or practice of technical communication or information design in New Zealand has been completed to date. This gap in the research provides an excellent opportunity for more research to be carried out that might further raise the profile of the profession in New Zealand, and to ensure that its practitioners have the knowledge to allow them to determine the future of their roles here. The following headings indicate some key areas where future research might be performed:

- Statistical information: a New Zealand profile
- Training
- STC funding for research.

Statistical information: A New Zealand profile

A more detailed profile of those producing information products in New Zealand would be a useful tool for planning training courses, predicting trends, and raising the profile of the profession.

Specific details are needed, including:

- The number of practitioners in New Zealand
- The industries and services they work in or are involved in
- The type of tasks and documentation they are involved in

- The regional variations in the type of work done (e.g. it is assumed that Wellington practitioners are involved with writing government policy while those in Christchurch are more likely to be involved in computing and electronics)
- The salaries of practitioners to provide information on the recognition of the profession
- The age/gender distribution of practitioners to determine whether the profession is comprised mainly of women as it is in the States.

A comparative study of the profession in other countries such as Australia, Europe and Asia would also be an area of future research as little is known about the profession outside the US.

Training

This study indicates that more training is needed if New Zealand is going to keep up with the demand for skilled people to produce information products. Information design requires a broad range of skills and opportunities for those with graphic design and multimedia skills, instructional design or teaching skills, writing skills and business skills to be part of an information design team that would put into reality the "blueprint" of the information designer.

Further research is needed to explore:

- The potential of information design as a career path for professionals.
- The potential of New Zealand as an "exporter" of information products. One participant believed New Zealand had great potential to train people who could convey online information. He described an apparent worldwide shortage of people who can write well and who can convey information in an Internet environment.
- The potential of teaching information design at secondary and tertiary levels of education to develop skilled practitioners to take advantage of knowledge based economies.

- The viability of introducing a Bachelor of Information Design at Christchurch Polytechnic Institute of Technology (CPIT) in 2003 using online education programmes via the Internet. As the paradigm shift from technical communication to information design has already happened, it would be important to design any new training programmes around the core competencies of information design. However, the graduate profile of this degree needs to be established before the course content is defined.
- Computer tools training courses for practitioners that focus on the essential skills a practitioner needs to complete a task using the software.

STC funding for research

The STC offers the largest research grants per project of up to $US10,000. No one in New Zealand has applied for this money. NZTWA do not offer any financial support for research.

Successful applications for the grant would allow more detailed research in the following areas that STC has a special interest in supporting (Intercom, 2001, p. 27).

- "Effectiveness of information design and expertise required to develop information for paper, electronic, and Web formats". This research would benefit those already in the profession as well as defining information design more clearly. Academic courses of study would also benefit from this information.
- "Professional, social and environmental trends affecting technical communication". New paradigms, such as pattern language, could be used in problem solving, HCD, cognitive science and knowledge management.
- "Technical communication in an increasingly global, wireless and mobile world". This topic would raise awareness of the profession and also show any market potential for New Zealand as information "exporters".

- "Usability of online information (help, Web and wireless), and how to use and learn from the results of usability testing". This research would help practitioners and trainers ensure that the information they are producing online is user-focused.
- "Implications of single-sourcing for multiple-use information". The results of this research could enable New Zealand to become world leaders in this field. Already New Zealand has produced AuthorIt, a highly successful single sourcing tool, and JADE is also researching the possibilities of this. Practitioners have had to make do with computer tools that limit what they are able to do because most tools are not written for or by technical communicators. This would be an ideal opportunity to create specific software for document management.
- "Knowledge, skills and sensitivities that practising technical communicators need in the 21st century and the effectiveness of teaching in these areas using classroom, on-site and distance learning". This in-depth information would provide vital information for developing academic and training courses.

While these STC topic fields offer excellent research possibilities, they are confined to the traditions of a profession that is well established. New Zealand has the potential to become a leader in information design research and does not have to be bound by the regulations of any one discipline. This allows a certain freedom to develop new directions for the future of the profession based on contemporary and future user needs.

Glossary

Audience analysis

A method of collecting data about the users of a document or product. Information can include age, gender, income, education, and knowledge of product/task.

AuthorIt

A software package or authoring tool that allows a single source of information to be used in a variety of multimedia channels, such as CD-ROMs, print, Internet, and online help.

The craft tradition

An approach to writing focusing on the "rules and guidelines" for doing things properly. This approach was dominant up until the 1940s. Writing students were taught the technical skills and the "do's and don'ts", such as correct grammar and proper usage.

Documentation

> All the shared records of a project or process, such as plans, specifications, analyses, descriptions, instructions or policies. Forms design can include interfaces of all kinds: reports, screens and Web pages. Education devices encompass manuals, instructions, training materials, exhibits and marketing materials (Edelman, 2001, p11).

Document design

> The field concerned with creating texts (broadly defined) that integrate words and pictures in ways that help people achieve their specific goals for using texts at home, school, or work" (Schriver, 1997, p10).

FrameMaker

A software package or authoring tool that allows a single source of information to be used in a variety of multimedia channels such as CD-ROMs, print, Internet, and online help.

Information design

> The field of information design applies traditional and evolving design principles to the process of translating complex, unorganized, or unstructured data into valuable, meaningful information. The practice of information design requires an interdisciplinary approach that combines skills in graphic design, writing and editing, instructional design, human performance technology, and human factors. (The Information Design Special Interest Group of STC, 2001, p10).

Knowledge management

"The efforts to capture, store, transform and disseminate information in a useful context within an organisation" (Carliner, 2000, p13).

NZTWA

New Zealand Technical Writers' Association

Plain language movement

A movement started by consumers to stop "gobbledygook" in documents. It is based on clear concise style and readability indexes.

Rhetorical tradition

> A writing tradition based on Greek rhetoric or the art of persuasion. The rhetoric tradition brings three important ideas to writing: "audience, invention, and heuristics" (Schriver, 1997, p58).

Romantic tradition

Writing is seen as an art that cannot be taught. It is creative writing and based on self-expression.

Single sourcing

Writing information once online and using it many times for different users and in different mediums.

SME

Subject matter expert e.g. an engineer, doctor, computer developer.

STC

The Society for Technical Communication

Technical communication

> A technical communicator is a translator of information from a subject matter expert (SME), such as an engineer or product developer, into knowledge that can be used by a specific audience to complete a specific task or solve a specific problem (Lay 2000, pp10–20).

Usability testing

"The process that involves live feedback from actual users performing real tasks" (Barnum, 2002, p16).

User

The target audience that a product or document is designed for. The user will be able to use the document to complete a task.

User-centered design

A design method that gathers:

> Information about users and tasks before they begin the product development process, then evaluate(s) the product with users as the product is under development, and repeat(s) this process to learn whether changes made improve the product as it moves through development (Barnum, 2002, p14).

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Appendices

Appendix One: A summary of participants' job tasks

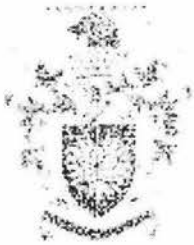
Name and Title	Main Tasks
Moana Team Leader Computer Based Training	Instructional design, staff training/online support.
Jill Information Specialist	Manuals, interviewing users, testing products writing code liaising with international softwa specialists.
Dave Quality Assurance Manager	ISO manuals, redesigning and writing manuals, product documentation, procedures for factory staff, rewriting NZQA apprenticeship training documents, completing root cause analyses for customer complaints.
Rene Senior Project Manager	Managing technical writers and documentation projects, responsible for document design concepts, newsletters, intranets and Internet sites.
Matt Director of Internet Company	Managing Web design projects, copywriting, designing and maintaining New Zealand Web site directory.
Trudi Manager	Sales and operation manager, production of technical manuals, operations manuals, intranets, training packages, business analysis, usability testing.
George Manager	Managing publications and organising Web site.

Alice	
Document Coordinator	Online, paper based training manuals for banking.
Madi	
Documentation Consultant	Developing, designing and managing online document projects for computer system clients.
Adrian	
Document Specialist	Online documentation, training trainers, writing Web help, word templates, user requirement specifications.
Joyce	
Document Specialist	(see Adrian's tasks).
Sam	
Documentation Consultant	Contract work templates, process documentation procedures, training materials, business plans and software documentation.
Rod	
Document Writer	Online support for port shipping management, training courses, marketing material and tenders.
Cyril	
Document Manager/Team Leader	Managing team of technical writers, writing document plan for team, liaised with developers, ensuring completion of projects and document consistency.
Graham	
Technical Author	Revising and updating company marketing and sales online menus, training documents, company standards.
Dawn	
Technical Publications/Team Leader	Team leader of technical writers, ensuring project specifications completed on time, ensuring the team had the resources to complete projects.

Win	
Technical Writer	Redesigning and restructuring existing company manuals.
Tom	
Technical Writer	Writing software, online help and hard copy manuals for banking software.
Bruce	
Journalist	Writing feature articles, marketing and research reports, brochures, copywriting, online tutorials and manuals.
Rochelle	
Web content consultant	Managing writing Web site, rewriting documents for the Web.
Tina	
Owner	Coaching and mentoring of document team, business analysis, and devised knowledge management systems for clients.
Rebecca	
Owner	Business management, operation manuals, training manuals, heath and safety systems, and newsletters, user guides and editing.
Chloe	
Writer	Writing projects for Rebecca.
Emily	
Owner	Business management, project management, personnel management consultant, documentation for policies, procedures, company software and business plans.
Perry	
Business Communication Consultant	Writing and designing Web sites, company profiles, brochures, direct marketing material, sales packs and presentations, product sheets and manuals.

Appendix two:
Research project information sheet

Massey University



Department of Communication and Journalism
Private Bag 11 222,
Palmerston North,
New Zealand
Telephone: 64 6 350 57 2369

COLLEGE OF BUSINESS

Technical Communication Trends in New Zealand
Research Project Information Sheet

Name of Researcher: Alison Reynolds
Programme Leader Graduate Diploma of Technical Communication
School of Languages and Communication
Christchurch Polytechnic Institute of Technology
Ph: 03 3798 150 x 8155 Fax 03 364 9036
Email: reynoldsa@cpit.ac.nz

Supervisor: Catherine Wallace
Dept Communication and Journalism
Private Bag 11 222,
Palmerston North,
New Zealand
Ph: 64 6 350 5799 extn 2369
Email: C.M.Wallace@massey.ac.nz
Information

My name is Alison Reynolds and I am completing this research project as part of my Masters of Management degree at Massey University. I am the contact person for and the leader of this research project. You are invited to participate in this research project to find out about technical communication trends in New Zealand. The purpose of the study is to find out what technical communicators do and the future direction of technical communication as a profession in New Zealand. The Society for Technical Communication New Zealand Chapter gave me permission to use your contact details.

The research would require you to take part in an audiotaped interview in your workplace. The interview will take approximately 30 – 45 minutes of your time. A research assistant, who has signed a Contract for Transcription of Tapes to ensure confidentiality, will transcribe the audiotapes. You will receive a copy of the transcript to sign off as a fair and accurate record of your interview.

The results of the project will be published and presented orally to:

- Complete a research report to meet the requirements of a Masters of Business Management degree, Massey University
- Disseminate results to technical communication practitioners through conference papers and publications for technical communication associations
- Develop technical communication and information design programmes to meet present and future needs of New Zealand practitioners

To ensure confidentiality, your name and the name of your organisation will not be used in any published material. You can withdraw from the project or decline to answer any questions. Once the project is completed the audiotapes of your interview will be erased and transcriptions of your interview will be stored in a locked filing cabinet that will be accessible only to the researcher and supervisor. The transcripts will be analysed and used as source material for a report.

If you consent to participate in the study you have the right:

- To decline to participate
- To refuse to answer any particular questions
- To withdraw from the study at any time
- To ask any questions about the study at any time during participation
- To provide information on the understanding that your name will not be used unless you give permission to the researcher

You will receive an email attachment of a summary of the findings of the study when it is concluded.

I will be pleased to discuss any concerns you have about participation in the project.

This project has been reviewed and approved by the Massey University Human Ethics Committee, PN Protocol 01/54

Appendix three: Consent form

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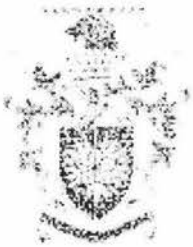

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Technical Communication Trends in New Zealand

CONSENT FORM

I have read the Information Sheet and have had the details of the study explained to me. My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time.

I understand I have the right to withdraw from the study at any time and to decline to answer any particular questions.

I agree to provide information to the researcher on the understanding that my name will not be used without my permission.
(*The information will be used only for this research and publications arising from this research project*).

I agree/do not agree to the interview being audiotaped.

I also understand that I have the right to ask for the audiotape to be turned off at any time during the interview.

I agree to participate in this study under the conditions set out in the Information Sheet.

Signed: .....

Name: .....

Date: .....

Appendix four: Contract for transcription of audiotapes

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Department of Communication and Journalism
Private Bag 11 222,
Palmerston North,
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Telephone: 64 6 350 57 2369

Contract for Transcription of Audiotaped Test Results of Technical Communication Research Project

Name and Contact Number of Researcher:
Alison Reynolds
School of Languages and Communication
Christchurch Polytechnic Institute of Technology
Ph: 3798 150 x 8155 Fax 03 364 9036
Email: reynoldsa@cpit.ac.nz

Confidentiality Agreement

I, (name of transcriber) have agreed to summarise the research data from the audiotapes into a written form. I agree to maintain complete confidentiality in regard to anything I may hear or read in connection with this research.

All tapes, computer discs, and paper copy of this information will be kept in a secure place while I have it for the purposes of transcription. All the aforementioned material will be returned to Alison Reynolds on completion of each transcription to be securely stored and any electronically stored information will be erased.

I understand this agreement is binding both now and in the future.

Signed..... *(Transcriber)*

Signed..... *(Researcher)*

Date .....

Appendix 5: Email to chairs of STC and NZTWA

Email to chairs of STC (Robyn Stephens) NZTWA (Ruth Hamilton)

My name is Alison Reynolds and I am the Programme Leader of the online Graduate Diploma of Technical Communication at the Christchurch Polytechnic Institute of Technology. My colleague, Jane Gregg Robberds and I are completing a research project to find out about technical communication trends in New Zealand. We would like your permission to contact your members to ask them if they would be willing to be participants in our research project.

The purpose of the study is to find out what technical communicators do and the future direction of technical communication as a profession in New Zealand. We hope that the study will advance the recognition of the profession, develop excellence in training and provide information to current and potential practitioners about what is presently happening in New Zealand.

I have attached an information sheet and ethics form for you to read.

If you can help us with the contact details of your members, please let me know by email:
reynoldsa@cpit.ac.nz

Regards
Alison Reynolds
Senior Lecturer
Technical Communication
Christchurch Polytechnic Institute of Technology

Appendix six: Email to sent to all participants

Attachment 2

Copy of with Information Sheet and Ethics consent form attached.

We invite you to participate in a research project to find out about technical communication trends in New Zealand. The purpose of the study is to find out what technical communicators do and the future direction of technical communication as a profession in New Zealand. We hope that the study will advance the recognition of the profession, develop excellence in training and provide information to current and potential practitioners about what is presently happening in New Zealand

My name is Alison Reynolds and I am the Programme Leader of the online Graduate Diploma of Technical Communication at the Christchurch Polytechnic Institute of Technology. My colleague, Jane Gregg Robberds and we will be in ... location....date ... .

Your name was given to us either by the Society for Technical Communication or the Technical Writers Association of New Zealand as a potential participant.

The research would require you to take part in an audiotaped interview in your workplace. The interview will take approximately 30 minutes of your time. I will ask you some general questions about what your role as a technical communicator involves and Jane Gregg Robberds will ask you about the 'tools' you use to complete your work.

I have attached an information sheet and ethics form for you to consider if you wish to be part of the interviews. If appropriate, we will also need to get approval from your manager or CEO to conduct the interview.

If you wish to participate, please let me know by email: reynoldsa@cpit.ac.nz

Regards
Alison Reynolds
Senior Lecturer
Technical Communication
Christchurch Institute of Technology